

ADMISSIONS TESTS AND UC PRINCIPLES FOR ADMISSIONS TESTING

**A Report from the Board of Admissions and
Relations with Schools (BOARS)**

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EXECUTIVE SUMMARY

In 2003, the University of California Board of Regents approved UC's current required standardized testing pattern provisionally¹, pending a report from the Board of Admissions and Relations with Schools (BOARS) about the extent to which the new SAT Reasoning Test aligns with BOARS' January 2002 "Testing Principles."² Over the last three years, BOARS and its Testing Subcommittee have consulted the College Board, ACT Inc., and various testing experts to assess the degree to which these goals are being met. In the following report, BOARS:

1. Recommends that the Board of Regents remove the provisional status of the SAT Reasoning Test;
2. Articulates the role of UC's testing pattern in the new eligibility reform policy passed by the Regents in February 2009; and
3. Identifies possible new testing policy paths BOARS and UC should explore in the future and recommends that BOARS revisit and revise its 2002 Testing Principles.

ABSTRACT

The University of California is a highly-selective, egalitarian institution to which prospective students submit extensive information in their admission applications, including scores from a standardized core test and two subject-specific tests. UC considers test scores in two stages. First, UC determines the general eligibility of each applicant through an index that combines high school grade point average (GPA) in a specific set of courses with the core test score and subject tests. The index allows a student's strength in one measure to compensate for weakness in the other, thus offering alternative, but not entirely independent means to earn eligibility. Next, UC campuses select eligible students for admission by conducting a comprehensive review of all application information, including test scores. Currently, there are several pathways to admission within this two stage process that safeguard against excessive reliance on test-scores, while allowing them some power to compensate for anomalous or missing grades. Beginning in fall 2012, applicants will be entitled to a comprehensive review at any UC campus they apply to if they meet GPA requirements in 11 'a-g' courses by the end of 11th grade. At the same time, UC will no longer require applicants to submit SAT Subject test scores for eligibility.

UC's use of standardized admissions tests and the tests themselves have evolved gradually away from a preference for "aptitude" testing to an emphasis on curriculum-based measures of achievement. BOARS' developed its nine Testing Principles in 2002 to guide the design and use of admission tests at UC. This prompted the College Board to develop the SAT-Reasoning Test (SAT-R), which incorporated a writing component previously administered in the SAT-II Subject tests. Similarly, ACT Inc. developed the ACT-with-Writing.

BOARS has determined that the new SAT-R and ACT, as well as UC's use of scores from these tests in both stages of the admissions process, align more closely with the Testing Principles than their predecessors. While the SAT test does not align fully with the Principles, we note that it is unlikely that any national, omnibus, three-hour core test, designed to place applicants into

¹ <http://www.universityofcalifornia.edu/regents/minutes/2003/edpol1703.pdf>

² <http://www.universityofcalifornia.edu/senate/committees/boars/admissionstests.pdf>

percentile rankings, can be re-engineered to satisfy all of the Principles completely. Therefore, we must measure the value of the tests in part by the extent to which test scores augment the power of the high school GPA to predict college success compared to the social and financial burdens of test-taking.

The new SAT-R adds significant gains in predictive power of first year grades at UC (from 18.8% to 27.1% of the variance). In the case of the SAT-R, these gains appear to derive primarily from new writing and mathematical elements previously reserved for Subject tests. This observation aligns with impending changes in the admissions process that will make the SAT Subject tests no longer required for all UC-eligible applicants and shift their potential use to the campus selection stage.

The use of both high school GPA and core test scores to predict UC freshman GPA is highly redundant in California. Most studies point to high school GPA as the best single predictor of college success, leading some to challenge the need for an additional core testing requirement. In comprehensive review, however, more attention is given to individuals and anomalies, so the use of both high school GPA and test scores helps UC evaluate non-traditional applicants without high school GPAs, and also allows campuses to flag for special scrutiny applicants from traditional schools whose high school GPAs are at odds with their test scores. In short, the eligibility index addresses an element of fairness that requires all applicants to be treated the same, while comprehensive review addresses an element of fairness that requires everyone to be treated as individuals. Therefore, the redundancy between high school GPA and test scores is necessary to maintain a balance between the social burden of the testing requirement and the benefit of added fairness to the individual.

The social burden of test-taking also involves possible uneven impacts on portions of the State for whom UC is mandated to provide equal opportunity and access. BOARS based its recent recommendation to eliminate the Subject test requirement for eligibility in part on evidence that it arbitrarily excluded many high-achieving students, particularly those from under-represented groups. With the passage of eligibility reform, this requirement will be removed from the eligibility index beginning in fall 2012, although Subject test scores will retain their use as an alternate means to satisfy the 'a-g' subject requirements and may be used by campuses during comprehensive review, similar to Advanced Placement (AP) and International Baccalaureate (IB) exam scores, as evidence of an applicant's mastery of curriculum. But the impact of the core test requirement on socio-economically disadvantaged groups is less readily mitigated, as the new tests do not eliminate the negative impact on underrepresented groups that characterized their precursors.

Despite their shortcomings, however, standardized tests do provide students and schools with a uniform reference point that is independent of a particular school's grading system or associated biases. Without the SAT or ACT, UC would lose much of its predictive modeling capability and capacity to compare itself to other national institutions. Moreover, it could encourage high schools to engage in more grade inflation, and if admissions criteria are decided purely at the local level, the public may begin to lose confidence in the evenhandedness of UC's admissions decisions. While BOARS considered recommending the elimination of the core testing requirement, we decided not to take such a step at this time due to these concerns and our view that the requirement adds to the overall fairness of the admissions process.

KEY BOARS RECOMMENDATIONS

1. The Board of Regents should remove the provisional status of the SAT Reasoning Test.
2. BOARS will update its 2002 Testing Principles to include the following principle that reinforces the role of the current use of admission test scores:

“to increase the options available for applicants to demonstrate their preparedness for college.”

In addition, BOARS Testing Principles should explicitly prefer tests that are not only curriculum-based but also scored by reference to achievement standards.

3. After the first cohort of students that submitted the new core tests graduates in 2010-11, BOARS should analyze four-year outcomes for comparison with the Geiser and Santelices (2007) study.
4. Given that the ACT test is the more curriculum-based of the current core tests, UC should signal to applicants that it finds the ACT more aligned with ‘a-g’ coursework and high school curriculum than the SAT-R test, and increase the number of California high school students who take this exam.

We also identify three possible long-term admissions policy paths to explore, the feasibility and consequences of which BOARS can continue to examine. These include:

1. Given that not all admissions pathways rely on core test scores for determining eligibility (ELC, for example) BOARS should weigh the consequences of adopting the practices evolving at the growing number of four-year colleges that have made the core test optional.
2. BOARS should consider alternate ways of determining the 12.5% target.
3. Although there are prohibitive barriers between California Standards Tests and the needs of college admissions, BOARS should remain an interested party in any conversations about whether the curriculum-based state-wide testing could be designed to satisfy curriculum standards and college eligibility.

1. INTRODUCTION

In February 2001, UC President Richard Atkinson called for the elimination of the SAT Reasoning Test requirement in favor of tests that assess mastery of specific subject areas. The motivations were to increase inclusiveness and fairness and to avoid controversial notions of aptitude. In November of that year, the College Board and ACT Inc. announced that they would attempt to develop tests to satisfy UC's requirements. ACT Inc. would add an optional writing component to the existing ACT core test, and the College Board would redesign their SAT-I core test. Anticipating these changes in 2002, BOARS articulated nine Principles concerning admissions tests and proposed changing the testing pattern required for UC freshman admission. Starting with fall 2006 admissions, applicants were required to present scores from three tests: the new SAT-R—a three-hour long, omnibus, core test of mathematics, language arts, and writing; and two one-hour tests in specific content areas covered by the University's 'a-g' requirements, which specify the high-school [college-preparatory subject areas required of all applicants](#). BOARS expressed confidence that the ACT-with-Writing, built to be more curriculum-based than other tests, would meet the Testing Principles. BOARS gave provisional approval to the new SAT-R under development, subject to the requirement that BOARS:

“...complete a comprehensive review of admissions tests and their alignment with UC testing principles no later than 2008. In the intervening years, BOARS will undertake to collect data that will enable an evaluation, according to BOARS principles, of the tests for which UC accepts scores.” (Unanimous BOARS motion, March 18, 2003)

BOARS' 2002 discussion paper also includes general cautions about striking a balance between the Testing Principles and the practical need to meet an eligibility target:

“... the University should consider carefully the policy implications of its use of tests and base its conclusions and future actions on educational policy grounds. . . . pragmatic reasons – while important – are insufficient justification in themselves for the adoption of a test requirement or the selection of a specific test battery.”

To prepare for the current report, BOARS consulted with academic experts and application readers, sought input from the testing agencies, monitored the impact of the new tests on admission outcomes, and explored statistical models based on the growing database of applicants and admittees who have taken the new tests (*see Appendix 1 for a detailed timeline*). Concurrently, BOARS' mandate in Senate Regulation.410 to monitor admissions requirements and outcomes annually led to the impending changes in the freshman admissions pathways approved by the Regents, which will change the role of test scores. Accordingly, BOARS will report in this paper on the alignment of the current tests with the impending changes to UC's admissions policy.

BOARS' 2002 discussion paper establishing the nine Principles describes the proper uses of admissions tests, desirable test properties; and oversight. In this paper, we examine how current tests and admissions practice measure up to the Principles in these three aspects. First, however, it is helpful to summarize the current role and style of admissions testing in their wider historical context. The development of the new core tests was not so much a redirection as one more step in a trajectory of change that has been generally consistent for several decades.

2. THE ROAD TO THE CURRENT ADMISSIONS TESTS

High school students take examinations to prove their mastery of course content and compete for job placement and college admission. Nationwide testing protocols, which attempt to measure achievement across a wide spectrum of schools, appeared in some European education systems two centuries ago. Results from such centralized examinations have served several purposes that are not necessarily easily reconciled: to encourage uniformity in school curriculum and quality; to guide course selection and development; to determine high-school graduation; to measure college preparedness; and to limit college access to prescribed fractions of the population. In 1901, the College Board began designing exams for the purpose of managing admission to North American universities. The Board's examinations initially followed the European pattern—they were subjectively graded, curriculum-based, essay exams with several different subject sections.

Through decades of episodic adjustment, the European tests retained their curriculum-based character. By contrast, the College Board soon departed from this model by attempting to measure raw aptitude rather than actual achievement, by favoring question formats that could be rapidly machine-graded for large numbers of test-takers, and by scoring tests in a manner that compares test-takers to each other—known as “norm referencing”—rather than a scale of the skills and knowledge they have mastered (“criterion referencing”). Subsequent revisions of the College Board's exams may be seen as a prolonged return journey to their original model. Some steps along the way have been prompted by the experiences and wishes of major public universities, especially the University of California (milestones are summarized in more detail in Appendix I). Emphasis on aptitude weakened in favor of more curriculum-based achievement tests³. Test design came to favor more essay-writing and problem solving. Now state and national agencies promote curriculum standards and implement tests based on those standards (standards-referencing). Pressure to reduce the number and cost of examinations, in combination with demands for a seamless transition from K-12 to college, limits the appeal of norm-referenced tests that are best suited only for rapid differentiation of academic preparation among college applicants.

The College Board introduced its Scholastic Aptitude Test (SAT) in 1926 and its Subject tests (SAT-II) in the 1930s. The SAT's main competitor, the ACT, was launched in 1959 as a four-subject test with deliberate emphasis on achievement rather than aptitude. According to ACT Inc., the test was designed “to measure what students could do with their intelligence, not simply measuring intelligence” and thus “yield more uses of the test than simply college admissions.” For brief descriptions of the test formats, see Appendix II.

BOARS first recommended using the SAT test in 1958, but the Academic Assembly turned it down because it viewed test scores as adding only marginal improvement to the predictive value of the high-school GPA. Ten years later that had not changed, but a need had arisen to return to compliance with a 12.5% eligibility cap and to expeditiously rank-order large numbers of applications. Therefore, in 1968 the Assembly adopted a BOARS recommendation to require the SAT-I and three SAT-II test scores. The total SAT-I + II score provided a cut-off for applicants with a GPA below 3.1. BOARS reasoned that the combination was a justifiable improvement

³ Atkinson, R. C., and Geiser, S., 2009, Reflections on a century of college admissions tests. Center for Studies in Higher Education, Research and Occasional Paper 4.09.

over the best single predictor of academic success (high school GPA) and would counter-balance inequities in high-school grading standards.

The University accepted the ACT as an alternative to the SAT-I in 1977. A sliding scale of SAT-I or ACT scores was then applied as an Eligibility Index to rate applicants with a GPA below 3.29. SAT-II test-taking was retained as an eligibility requirement. Following the 1996 California Postsecondary Education Commission (CPEC) study of eligibility rates, BOARS recommended re-incorporating SAT-II scores, weighting them twice as much as the SAT-I in the Eligibility Index, and applying the index to all GPAs. Another admissions pathway – Eligibility in the Local Context (ELC) – was added in 1999; it required submission of test scores, but based eligibility on the applicants’ ranking within their own high schools, as determined by GPA in ‘a-g’ coursework.

More sweeping changes, leading to the mandate for this report, were triggered in 2001 when then UC President Richard Atkinson called for the elimination of the SAT-I in favor of tests that assess mastery of specific subject areas – a move back toward the European model. BOARS delivered the corresponding Testing Principles in 2002 together with a template for admission tests that would consist of one core examination (in mathematics, language arts and writing) and two subject examinations. In 2003, Academic Council approved BOARS’ transition plan to accept the ACT-with-Writing and, provisionally, a new SAT-R as satisfying the core test requirement. BOARS committed to evaluating the new tests from their first use through 2008; however, critical data on student performance at UC among cohorts taking the tests were not available for evaluation until late 2007, and national studies were released in 2008.

3. THE UNIVERSITY’S USE OF ADMISSIONS TESTS: PRINCIPLES AND PRACTICE

This section reviews the over-arching principles that guide admissions testing and examines how test scores are used in each stage of the admission process. UC admission must manage delicate balances. The Organic Act of 1868 (section 14) establishing the University of California assigned to the UC Regents the duty “according to population, to so apportion the representation of students, when necessary, that all portions of the State shall enjoy equal privileges therein.” California’s 1960 Master Plan for Higher Education mandates that UC draw from the top 12.5% of California high-school graduates. The means to define “all portions” and determine the top 12.5% are left to UC, but the options are limited by the opposing constraints of California’s Proposition 209 and Title VI of the federal Civil Rights Act of 1964. Regents’ policy (RE-28, 2001⁴) seeks “to enroll on each of its campuses a student body that demonstrates high academic achievement or exceptional personal talent, and that encompasses the broad diversity of backgrounds characteristic of California.” The applicants and their families expect a fair and transparent process.

To manage its mandates and responsibilities, the University has come to allow freshman admission via several pathways. The details of these pathways will change for freshmen admitted in fall 2012, but then as now, all students will pass through the same principled, two-stage, admissions process: evaluation for eligibility or preparedness for UC based on minimum criteria, and also selection by a specific campus using comprehensive review.

⁴ <http://www.universityofcalifornia.edu/regents/regmeet/may01/re28new.pdf>

In the first stage, currently a system-wide formula (based on test scores and high school GPA in 15 ‘a-g’ courses) is used to establish whether applicants meet minimum criteria for review and selection, or otherwise must be considered “ineligible”. This formula sets limits on eligibility and must be adjusted periodically to meet the mandatory 12.5% eligibility rate. CPEC formally determines how many California high school graduates meet UC’s minimum ‘a-g’ course requirements, GPA, and testing pattern. In the second stage, guided by system-wide principles, individual campuses make offers of admission to individuals who they select by comprehensive review of all information in students’ applications. The two-stage process allows UC to maintain compliance with the Master Plan without unduly restricting the ability of each campus to select a locally distinctive and vibrant community to attain an environment conducive to campus-specific educational goals.

The system-wide eligibility index was developed at a time when campuses lacked the capacity to manage comprehensive review. It ensures that element of fairness that follows from uniform comparisons across the whole applicant pool. Campus-level selection ensures that element of fairness which requires closer scrutiny of individual application files, including information about students’ academic and personal accomplishments not available in an index. Both stages – system-wide rating and campus-level selection – use test scores among other measures of academic preparation.

3.1. Principles

Four of BOARS’ 2002 Principles establish appropriate uses for test scores.

- “1. Admissions tests will be used at the University of California to
- assess academic preparation and achievement of UC applicants;
 - predict success at UC beyond that predicted by high school GPA;
 - aid in establishing UC eligibility; and
 - aid in selecting students for admission to individual campuses.”

The third and fourth principles justify using test scores in both stages of the admissions process, system-wide rating (eligibility determination) and local selection (comprehensive review). The first two principles establish that test scores may be used in backward-looking mode to measure past achievement and in forward-looking mode to predict future success. The University does both: it prefers tests that measure mastery of college preparatory material (principles concerning test properties) but justifies their use through their ability to predict college grade point averages and retention. The second bullet implies that test scores should augment the predictive power of the high school GPA. It does not specify by how much. This critical issue has been the subject of several statistical modeling studies and is addressed at the close of this section.

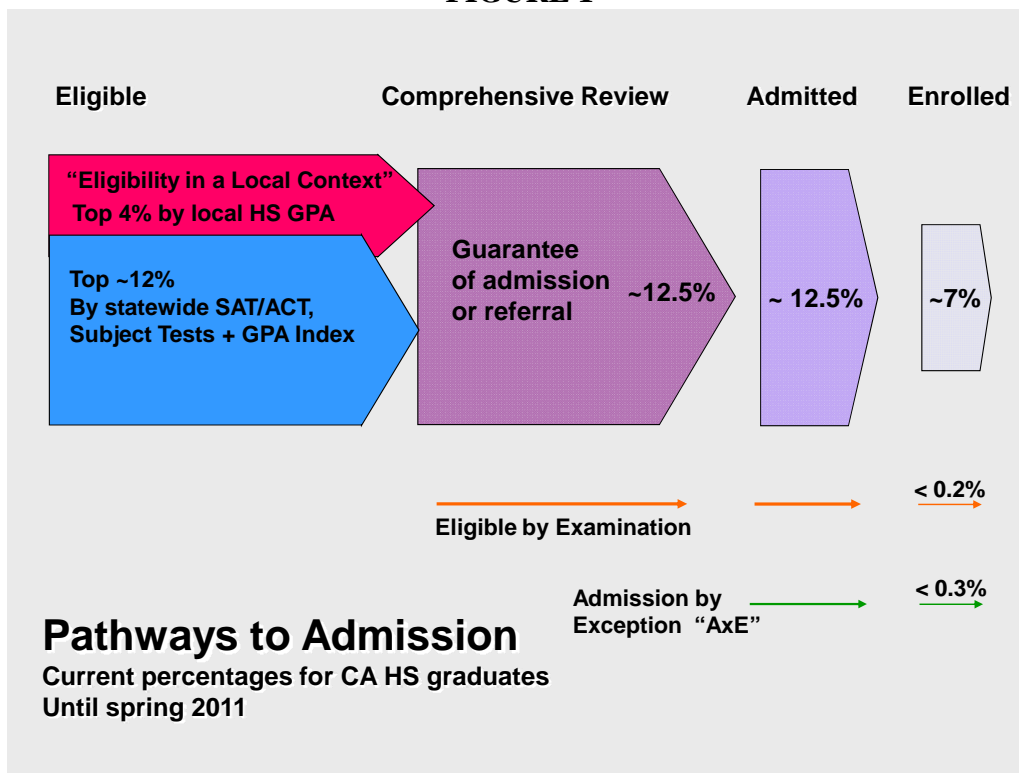
3.2. The Use of the Core Test in UC Eligibility Regulations (admissions stage 1)

Currently, there are several pathways to UC freshman admission⁵ within the two-stage admissions process. This multiplicity helps ensure that achievement can be fairly recognized and rewarded in the context of opportunities that are, regrettably, not uniform across all portions of the state. The two major pathways are statewide eligibility and eligibility in the local context

⁵ http://www.universityofcalifornia.edu/admissions/undergrad_adm/paths_to_adm/freshman/scholarship_reqs.html

(ELC). Two minor pathways are admission by examination and admission by exception (A by E). See Figure 1 below:

FIGURE 1



Statewide eligibility confers a guarantee of admission to at least one UC campus, subject to fixed thresholds for course and test completion and according to a sliding index in which minimum test scores “may vary depending upon the overall grade point average”. BOARS adjusts the minimum thresholds periodically so that the sum of statewide and local guarantees approaches the mandated 12.5%. ELC became effective for 2002 admits and currently confers a guarantee to the top 4% in each high school, “based on GPA in all University-approved college-preparatory courses taken in the 10th and 11th grades” and subject to the same thresholds for course and test completion.

On the sliding scale for eligibility in the statewide context, high test scores may counterbalance a low GPA and a high GPA may counterbalance low test scores. The minimum GPAs and test scores that may separately confer eligibility by this process are rather low. Thus, the systemwide index allows test scores and GPA to function as alternative but not fully decoupled means by which applicants may demonstrate their potential to succeed at UC. ELC de-emphasizes test scores, focuses on student rank within schools on UC-approved courses, and attempts to compensate for local differences in opportunity, which include unequal access to preparation for admissions tests. Relatively high test scores allow students with lower GPAs to attain eligibility via the statewide index. ELC admittees, by contrast, show high GPAs combined with a wide and more uniform distribution of test scores. Lower test scores are associated with socio-economic

disadvantage⁶. Almost all ELC-eligible applicants also satisfy the statewide eligibility index, but the pathway allows UC to determine rank in high schools based on students' actual transcripts and performance on UC approved courses, reaching more students who otherwise may not have considered UC as an option.

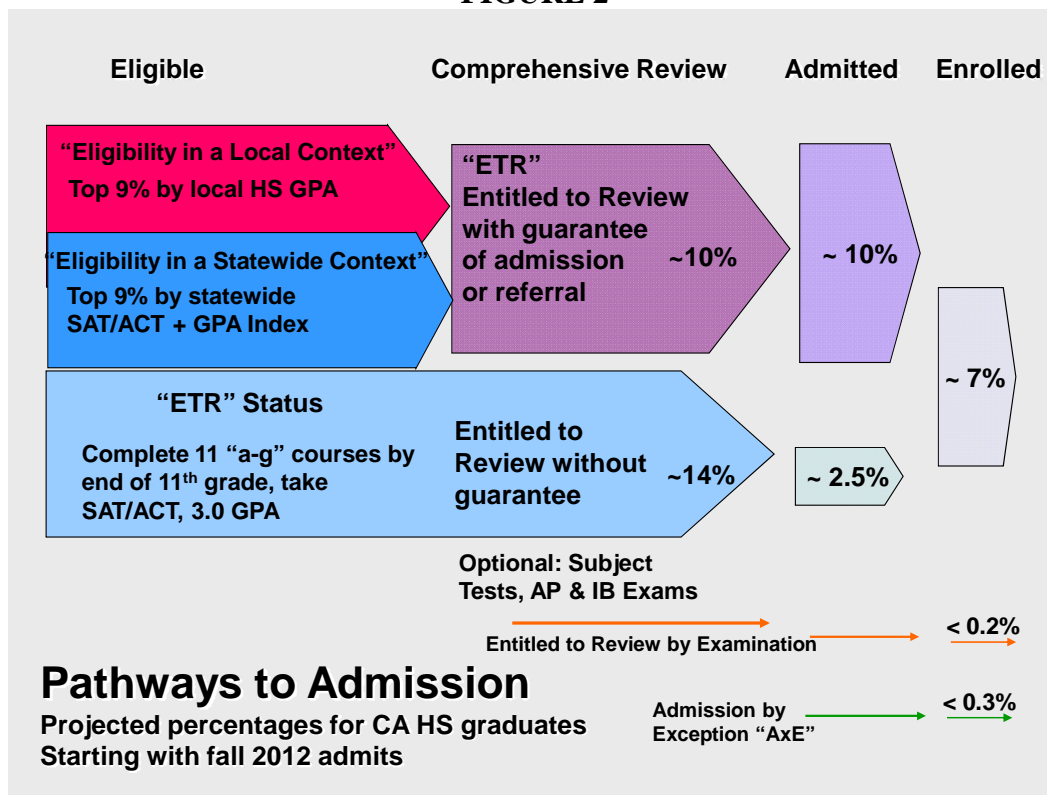
For freshmen entering UC in fall 2012, the proportions of the two primary pathways will change: the ELC guarantee will extend to the top 9% of students from every California high school that submits students' transcripts for review and statewide eligibility reduced to 9%, as required to meet the 12.5% mandate. This change increases the overall role of high school GPA in admission, though eligibility in the state-wide context will be determined by a modified index that will raise criteria for this group. Core test completion remains a requirement for both pathways, which together identify a group that is entitled to a comprehensive review by each campus that receives an application, along with a guarantee of admission somewhere in the UC system. All applicants must also complete 11 'a-g' course requirements between grades 9 and 11 and take a core test (the ACT with writing or SAT-R) in order to be "entitled" to a comprehensive review (ETR). Together, ELC and state-wide eligible students (determined using an index) will constitute about 10% of California high school graduates. The remaining 2.5% will be selected from the ETR pool, and all students are selected to specific campuses based on comprehensive review. Thus, the weight of tests in determining the first stage or preparedness for UC will be reduced, but will still remain a feature of comprehensive review and campus-specific selection. The power of high school grades and test scores to predict college outcomes for individuals falls far below that for outcomes for a group comprised of a significant or large number of individuals⁷. Logically therefore, the bright but weakly-informed line at the current limit of statewide eligibility will be replaced with general ETR criteria and allow more students to be selected on a fully-informed review of their achievements and circumstances. (See Figure 2.)

From the narrow viewpoint of test scores, the two minor pathways can be seen as ensuring even more fairness for applicants with discrepant scores; that is, higher or lower scores than expected given other measures of achievement and potential. Admission by examination is a pathway for students who score very well on admissions tests but cannot satisfy all the requirements for the major eligibility pathways. Admission by exception allows campuses to enroll small numbers (<6% of enrolled students) who despite considerable achievements, are not eligible for one reason or another, including low test scores. For freshmen entering in fall 2012, the admission by examination pathway will confer only a guarantee of a comprehensive review at the campus level not a guarantee of admission. Thus, the leverage of high test scores alone will be reduced, but not eliminated.

⁶ Caspary, Agronow, and Stern, *A Comparison of Measures Included in the UC Eligibility Construct with School Percentile Ranks in the Prediction of UC GPA* (2006). This study focuses on the 2003 entering cohort. See also Agronow & Horn (2008), *The Effectiveness of the California Standards Tests in the Prediction of Freshman Grade Point Average at the University of California: a Comparison with the SAT*, (2008) for a focus on the 2006 cohort showing all sections of the SAT-R correlate more with parental income than CA state standards tests or weighed capped HS GPA.

⁷ Geiser, S., and Santelices, 2007: Validity of high-school grades in predicting student success beyond the freshman year: high school record vs. standardized tests as indicators of four-year college outcomes. Center for Studies in Higher Education, <http://cshe.berkeley.edu/publications/publications.php?id=313>

FIGURE 2



3.3. The Use of the Subject Tests in Eligibility and Selection

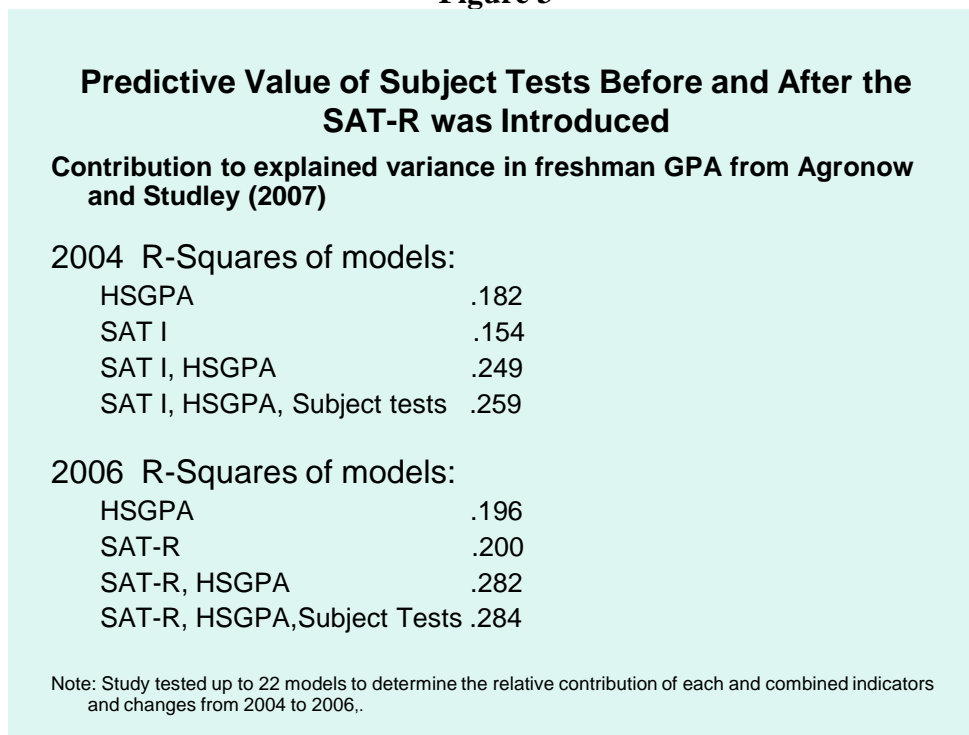
In addition to scores from the core test of mathematics, language arts and writing, current applicants “must also submit scores on approved supplementary subject matter tests to be taken in two different ‘a-f’ subject areas”. This requirement applies to both statewide and local eligibility pathways, even though the scores are not used to determine ELC. BOARS became troubled that applicants could be rated ineligible according to mere test-taking, not their scores. Most of the colleges UC competes with for students do not require subject test scores. BOARS found that too many high-achieving students and a disparate proportion from the under-represented portions of the state students become technically ineligible for failing to submit the full pattern of test scores. Based upon the California Basic Educational Data System (CBEDS), BOARS estimates that only 54% of students who complete the ‘a-g’ requirements are taking the Subject tests. That fraction falls to 38% and 35%, respectively, for Chicano/Latino and African American students. Furthermore, insightful writing and computational elements of the former Subject tests have been moved to the new core tests. Accordingly, starting with applicants for fall 2012, Subject test scores will not be required for either the first or second stage of admission.

SAT-II Subject tests satisfy only two of the Testing Principles better than the core tests. They are more obviously curriculum-based and they added more predictive power to high school GPA than the old SAT-I scores, but add very little to predictive power once the new SAT-R was introduced⁸. Figure 3 shows the predictive value of HSGPA, the old SAT-I and subject tests

⁸ Geiser, S., and Studley, R., 2002, UC and the SAT: Predictive Validity and Differential Impact of the SAT I and SAT II at the University of California. Educational Assessment, v. 8(1), p. 1-26; Agronow, S. and Studley, R. (2007), Prediction of college GPA from new SAT test scores - a first look. Annual meeting of the California

compared with HSGPA along with the new SAT-R with writing for one of the studies on first year performance for the 2006 entering cohort. The subject tests add little predictive value beyond the key predictors many more students already present in applications for college.

Figure 3



BOARS’ decision to move these tests from the eligibility stage to the selection stage of admissions was based on principles concerning test properties: fairness across demographic groups and social cost. After they are dropped from rating indices and eligibility thresholds, Subject test scores may still be used to satisfy ‘a-g’ requirements.

3.4. Core Test Scores and UC Selection Practices (admissions stage 2)

Applicant file readers have drawn BOARS’ attention to two valued uses of core test scores in the comprehensive review stage. The effectiveness of both depends on a high degree of predictive redundancy between high school GPA and test scores for the application pool in general. Some high-achieving California residents are home-schooled or attend non-traditional and unaccredited high-schools. Readers value test scores as a substitute for grades and a means to calibrate non-traditional transcripts. Readers from accredited high-schools look for discrepancies between high school GPAs and test scores as a sign that other criteria need to be examined in detail to explain these anomalies.

Association for Institutional Research (CAIR), Nov 16, 2007.
<http://www.cair.org/conferences/CAIR2007/pres/Agronow.pdf>, Agronow, S. and Rashid, M. Examining the Predictive Value of the SAT Subject Exams in the Prediction of First Year UC GPA – A Report to BOARS, Board of Admissions and Relations with Schools: November 2007.

Standardized testing has long been justified as a means to counter grade inflation and to control for variance between high schools. This might not be entirely necessary: differences in educational opportunity offered by California high schools may be measured by their Academic Performance Indices⁹ (API) and UC campuses can track the history of graduates of the high schools from which they admit students. The uses of the core test scores mentioned above extend the standardizing function from generalizing about schools to guiding the evaluation of exceptional individuals. As a characteristic of individuals, rather than group or average outcomes, these uses of test scores influence the selection stage and the admission by exception pathway, where the entire application is reviewed.

3.5. Applicants' Core Test Preferences

Many more applicants present scores for the SAT-R than the ACT-with Writing. Of over 83,000 applicants for fall 2006 admission, about 25,000 presented both SAT-R and ACT-with-Writing scores and a little more than 6,000 presented only ACT scores. Of the UC freshmen *enrolled* in 2006, over 33,000 presented SAT-R scores. Of these, about 9,500 presented scores for both core tests. This smaller set is the basis of our comparison of the two tests as predictors of freshman UC-GPA¹⁰. Only 270 of the enrolled fall 2006 freshmen presented ACT scores but not SAT scores. Applicants appear to regard the ACT-with-Writing as a possible supplementary test, rather than an alternative to the SAT-R. This is an issue BOARS will return to in our recommendations for future directions.

3.6. A Critical Issue: Predictive Redundancy between Test Scores and High School GPA

For decades prior to the redesign of the core tests, high school grades had been recognized as the best single predictor of college freshman outcomes. Standardized test scores, in their old format, and high-school GPA had limited but similar powers to predict college success as measured by retention and freshman GPA. Studies of the SAT core test can usefully be limited to UC admittees (e.g.¹¹ or applied nationally (e.g.^{12 13}). Fewer UC applicants submit ACT scores; so, for the ACT this predictive redundancy is established by national statistics^{14 15}.

From 1996 to 1999, high school GPA could explain 13-17% of the variance in UC freshman GPA and the SAT-I could explain 11-14%¹⁶. For 2004 admits to the University, these indicators could explain 17% and 18% of the variance in freshman grades, respectively.¹⁷ A combination of the two measures adds notably to the predictive power, explaining 19-22% of variance between

⁹ <http://www.cde.ca.gov/ta/ac/ap/>

¹⁰ UCOP Institutional Research 2-24-09 analysis presented to BOARS March 2009

¹¹ Kowarsky, J., Clatfelter, D., and Widaman, K., 1998, Predicting university grade-point average in a class of University freshmen: an assessment of the validity of a-f GPA and test scores as indicators of future academic performance. UC Office of the President. See also Geiser and Studley, 2002, and Geiser and Santelices, 2007.

¹² Ramist, L., Lewis, C., and McCamley-Jenkins, L., 1994, Student group differences in predicting college grades: Sex, language, and ethnic groups. College Board Research Report 93-1.

¹³ Bridgeman, B., McCamley-Jenkins, L., and Ervin, N., 2000, Predictions of freshman grade-point average from the revised and recentered SAT I: Reasoning Test. College Board Research Report 2000-1.

¹⁴ Noble, J., Davenport, M., and Sawyer, R., 2001, Relationships between non-cognitive characteristics, high school course work and grades, and performance on a college admissions test. Annual Meeting of the American Educational Research Association, Seattle, WA.

¹⁵ Robbins, S., Allen, J., Casillas, A., Peterson, C., and Le, H., 2006, Unraveling the differential effects of motivational and skills, social, social, and self-management measures from traditional predictors of college outcomes. *Journal of Educational Psychology*, v. 98, p. 598-616.

¹⁶ Geiser and Studley, 2002

¹⁷ Agronow, S., and Studley, R., 2007.

1996 and 1999 and 25.8% for 2004 admits. At the national level, high school grades are the best predictors of college grades with the SAT-I and ACT scores most effectively applied in combination with high school GPA¹⁸. Both ACT and SAT scores gain in predictive power for the most able students relative to the least able students (^{19 20}).

As long ago as 1958, however, the Academic Senate had questioned whether standardized test scores added sufficient information to justify their use in admissions. Test scores were introduced partly as a response to the need to constrain the number of eligible students. This fueled concerns that test scores are used “to cull students, not to give them the opportunity to come to the University” and not as “an alternative way to demonstrate their ability”²¹. BOARS presented its Testing Principles with a warning about this unfortunate tension between educational policy and pragmatic or efficiency rationales for using test scores.

The UC Testing Principles do not set a numerical threshold for the amount of predictive power that test scores should add to high school GPA. Rather, principles that govern the properties of tests charge us to measure the gain against the social burdens of test-taking. Given that there is considerable redundancy and some gain in using both measures, our concern is that the University should employ test scores in a manner that opens additional pathways to admission. The impending changes in the sliding eligibility index, ELC, and the opening of the eligibility pathway to allow more students to be considered for comprehensive review (meeting ETR criteria) are our devices to ensure this. Of course, for the redesigned core tests, we may reasonably insist that predictive power not diminish markedly relative to their precursors.

The first opportunity to analyze SAT-R outcomes for UC applicants (33,356 enrollees²²) suggests that the new test scores are a little more effective in the prediction of freshman UC-GPA. The SAT-R alone explains 20.0% of variance compared to 17.2% for the corresponding older combination of SAT-I (Math and Verbal) and SAT-II Writing. High school GPA emerged as now as roughly the same as the SAT-R, explaining 19.6% of the variance in freshman GPA. These findings for the new core test fit logically into the context of studies conducted prior to the drafting of the testing principles: they had isolated the source of the predictive power of the test scores primarily to the curriculum-driven SAT-II writing and math tests. The SAT-R incorporates elements of both. A later analysis considered the smaller set of fall 2006 freshmen (9,529 students²³) who had presented *both* SAT-R and ACT-with-Writing scores. For this particular group, a best predictive power of 27% without test scores rises to about 31% when one adds either or both core test scores.

Nationwide analyses of the SAT-R by the College Board^{24 25} and the ACT-with-Writing by ACT Inc. yield similar results: that the best predictive use of the new test scores is in combination with

¹⁸ Bridgeman et al, 2000

¹⁹ Ramist et al. 1994

²⁰ Noble and Sawyer, 2002

²¹ Garcia, Dean of Berkeley’s Graduate School of Education, 1988 testimony to Senate Select Committee on Higher Education Admissions and Outreach

²² Agronow and Studley, 2007

²³ UCOP report to BOARS, March 2009

²⁴ Kobrin, J., Patterson, B., Shaw, E., Mattern, K., and Barbuti, S., 2008, Validity of the SAT for predicting first-year college grade point average. College Board Research Report 2008-5.

²⁵ Mattern, K. D., Patterson, B. F., Shaw, E. J., Kobrin, J. L., and Barbuti, S. M., 2008, Differential validity and prediction of the SAT. College Board Research Report 2008-4.

high-school GPA. The College Board found the new writing section was the most predictive portion of the SAT-R test scores (compared with reading and math); this relationship held across all subgroups except test-takers for whom English is the second language. ACT Inc. found that the optional Writing section augmented the predictive power of the required English section, but was the less powerful of the two measures. Both the College Board and ACT Inc. report that their new core tests over-predict freshman college GPA for African American and Hispanic/Latino students but with a smaller differential than predictions based on high-school GPA alone. Both organizations have statistical support for the claim that their test scores have predictive power for grades in college mathematics and writing-intensive English courses.

For general eligibility rating of the entire applicant pool, the redundancy of predictive power between high school GPA and core test scores might support the argument that test-taking is an unnecessary burden. More than 800 four year colleges in the U. S. have made the core test scores optional for admissions²⁶. The predictive power applies to group performance, however, not individuals. For comprehensive review and case-by-case admission decisions, we have seen that redundancy at the group level becomes a bonus for the insightful analysis of individual cases. We need to balance the burden on the general population and “typical” applicants against the benefit of safeguarding fairness to exceptional individuals.

3.7. Predicting College Success beyond Freshman UC-GPA

The Testing Principles challenge us to find better measures of college success than freshman GPA. For the old core tests, it is possible to analyze four-year outcomes. Such a study²⁷, finds that high school GPA remains superior to test scores in predicting fourth year GPA and graduation. High school grades appear to explain more of the variance in fourth year than first year college grades. ACT Inc. examines final GPA outcomes and surveys alumni to track and post-baccalaureate success. They find stronger standardized beta coefficients for high-school GPA than ACT Composite scores as predictors of college GPA at graduation (0.35 and 0.19 respectively) but the opposite relationship for predicting highest degree attained (0.08 for high school GPA and 0.16 for ACT score).

Casparly and Agronow (2007) predicted retention into the second year of college using logistic regression for 28,000 UC students admitted as freshmen in 2004. High school GPA and SAT-I+II scores individually explained 9.6% and 6.7% of variance respectively. The prediction can be improved to 12.3% either by combining these two measures or by combining high school GPA with measures of rank in high school.

BOARS also examined a measure of college failure - leaving in academic difficulty after two years - for UC students whose SAT-I scores and GPA were higher or lower than the mean by one standard deviation or more²⁸. As expected the rate of leaving was highest (10%) for students rated low by both measures and lowest (1%) for students with two high classifications. The discrepant scores - one high and one low rating - were informative: the drop-out rate was 7% for students rated high by SAT but only 4% when the GPA was the high rating and SAT low. These relationships were not significantly altered by adding in the SAT-II subject test scores. By this measure, high school GPA is the better guide to retention for students whose test scores are

²⁶ <http://www.fairtest.org/university/optional>

²⁷ Geiser and Santelices, 2007

²⁸ Casparly and Agronow, 2007

poorly aligned with GPA. Overall, these results indicate that campuses will do well in their comprehensive review processes to consider high school GPA as the best predictor of long-term success in college, especially for students with discrepancies between test scores and GPA.

3.8. Other Aspects of the Student's Application

Test-taking carries a financial and societal burden. Accordingly, BOARS has examined whether other measures, already in the application, could substitute for the predictive power of admissions tests and obviate the burden. Multiple regression analysis of freshman GPA and logistic regression analysis of two-year retention statistics for over 28,000 students who entered the University as freshmen in 2004²⁹ identified variables that could replace much of the predictive power that the SAT-I added to high school GPA. These variables included, academic awards, subject grades, GPA trajectory over time, AP/IB courses, and the high school's API. Regrettably, those variables that could best substitute for the core test score are those that carry the same persistent disadvantages to underrepresented, socio-economically challenged regions of the state. This conflicts with the mandate of the Organic Act and principles for the properties of tests (section 4 of this report). At the same time, however, these are important measures that can be considered in comprehensive review to help understand discrepant test scores.

3.9. Summary

UC's regulation and practices of admission, both current and impending, comport with BOARS principles for the use of test scores. Changes enacted for 2012 (particularly the increases in ELC) mitigate some negative impacts of test-taking requirements in the eligibility pool. The strong relationship between test scores and high school GPA for the general population provides a means to better evaluate exceptional individuals with non-traditional or discrepant transcripts.

The new core tests augment the high-school 'a-g' GPA as a means to demonstrate mastery of basic college preparatory skills and to predict freshman GPA. By incorporating a writing component, the SAT has improved slightly in this regard, relative to the previous tests. The differing use of core test scores in the various admission pathways increases applicants' opportunities for admission. The remaining subject test scores that will be optional in the future, have two valid uses. For general eligibility they provide an alternative means to satisfy 'a-g' requirements. For comprehensive review, they are one means to assess depth and rigor of preparation beyond minimum eligibility. Thus, core and subject test scores find principled uses in both stages of the admissions process.

4. THE PROPERTIES OF ADMISSIONS TESTS: PRINCIPLES AND AVAILABLE TESTS

Although the uses of admission tests align with the University's principles, it remains to be determined how well the current tests themselves meet the design criteria specified in other principles and whether the current tests are the best options available to the University.

4.1. Principles:

Four of BOARS' 2002 principles describe desirable test properties:

- An admissions test should be a reliable measurement that provides uniform assessment and should be fair across demographic groups.

²⁹ Caspary and Agronow, 2006

- An admissions test should measure levels of mastery of content in UC-approved high-school preparatory coursework and provide information to students, parents and educators, enabling them to identify academic strengths and weaknesses.
- An admissions test should be demonstrably useful in predicting student success at UC and provide information beyond that which is contained in other parts of the application. (It is recognized that measures of success are currently limited, and generally include only first-year college GPA and graduation rate. As this field advances, better measures should be identified and used in validating admissions tests.)
- An admissions test should be useful in a way that justifies its social and monetary costs.

The third principle repeats the implication, already established in the principles for usage, that tests should not merely duplicate the predictive power of other information in an application. The first principle addresses fairness, an issue in which high-school GPA is known to be less problematic than test scores. In a study of four-year UC outcomes, Geiser and Santelices (2007) look beyond prediction and report that high school GPA is “only weakly correlated with family income, parent’s education and school API rank, whereas SAT scores bear a strong, positive relationship to each of these measures.” High-school GPA they conclude, “tends to have a less adverse impact than standardized admissions tests on underrepresented minority applicants, who come disproportionately from disadvantaged backgrounds.”

Part of the second principle – that tests measure levels of mastery of course content – implicitly demands curriculum-based tests and would appear to favor criterion referenced scoring. BOARS’ 2004 draft update clarified and amplified the second principle:

“ . . . regarding the desired curriculum-based, diagnostic, and prescriptive characteristics of the new tests . . . admissions tests should:

- assess the degree to which students have mastered what UC faculty expect to be taught and learned in college preparatory curriculum;
- serve as a diagnostic function, providing information useful for identifying students’ academic strengths and weaknesses;
- be able to serve a prescriptive function, directing a student’s college-preparatory choices and efforts; and
- continue to have utility in establishing applicant eligibility and in identifying students likely to succeed if admitted to local UC campuses.”

BOARS’ 2006 letter to the College Board sets a target for the Board’s response to the questions in the letter. It reinforces the quest for both diagnostic and prescriptive value:

“ . . . admissions tests employed by UC should:

- closely align with college-preparatory curricula,
- exhibit diagnostic value, whereby test results help test-takers understand their strengths and weaknesses in particular college-preparatory subject areas; and
- exhibit prescriptive value, whereby testing outcomes suggest what educational actions students might take in order to improve.”

4.2. Attainability:

In preparation for this report, BOARS consulted two experts on admissions testing, Drs. Sheldon Zedeck (UC Berkeley) and Rebecca Zwick (UC Santa Barbara), both of whom have served on a College Board advisory committee or panel. These experts cautioned that it was probably unrealistic to expect that a single, national, three-hour, core test with a percentile-based scoring system could be designed to fulfill equally well all the purposes implied in the principles: to measure achievement, predict success, and provide diagnostic and prescriptive feedback, while ensuring fairness and uniformity and minimizing the burden to test-takers. The consultants also noted that the closer a test is tied to curriculum, the greater the impact of unequal opportunity on the test scores; that is, the test scores more closely mirror the uneven quality of the schools (e.g., curriculum, teachers, and advanced academic opportunities). Nevertheless, we note that our principles are in line with the recommendations of other authorities and experts.

Two authors very familiar with the UC culture, Atkinson and Geiser (2009), offer a “broader array of characteristics that we should demand of our tests.” Five of them can be recognized within UC’s principles:

- “Admissions tests should have diagnostic utility . . .
- “Admissions tests should exhibit not only predictive validity but *face validity*: The relationship between the knowledge and skills being tested and those needed for college should be transparent.
- “Admissions tests should be *aligned with high-school curricula* . . .
- “Admissions tests should *minimize the need for test preparation* . . .
- “Finally, and most important, admissions tests should send a signal to students . . . that working hard and mastering academic subjects in high school is the most direct route to college.”

Their sixth principle prescribes a means to emphasize mastery:

- “Admissions tests should be *criterion-referenced* rather than norm-reference: our primary concern should not be how an applicant compares with others but whether he or she demonstrates a sufficient mastery of college-preparatory subjects to benefit from and succeed in college.”

The Boston-based FairTest Center recommends that admissions tests be curriculum based and also minimize the use of multiple-choice and short answer questions which “cannot measure many important kinds of learning”³⁰. BOARS’ design criteria have encouraged the new core tests to make these kinds of changes.

The National Association for College Admission Counseling (NACAC) found in 2008 that “colleges and universities may be better served by admission exams more closely linked to high school curriculum.” They offered advice for the appropriate use of admissions tests, including the following:

- “consider dropping the admission test requirements if it is determined that the predictive utility of the test or the admissions policies . . . support that decision and if the institution believes that standardized test results would not be necessary for other reasons such as course placement, advising, or research.”

³⁰ <http://www.fairtest.org/criterion-and-standards-referenced-tests>, August 2007

- “Despite their prevalence in American high school culture, college admission exams – such as the SAT and ACT – may not be critical to good admission decisions . . . There are tests that, at many institutions, are more predictive of first-year and overall grades in college and more closely linked to high-school curriculum, including the College Board’s AP exams and Subject Tests, as well as the International Baccalaureate examinations.”

The 2006 US Commission on Higher Education provided an over-arching mandate for stronger curriculum connections. College participation and success, it states, needs to be dramatically expanded by creating a seamless pathway from high school to college in which a high school diploma signifies that a student is ready for college. This is akin to “matriculation” as it has been understood in some European education systems.

4.3. The new SAT-Reasoning Test (SAT-R)

In 2003, when the new testing pattern was adopted, BOARS was circumspect concerning the new SAT core test:

“The new SAT is still under development and while the planned changes are encouraging, there is not sufficient evidence yet concerning the final format of the test to determine if it will align with UC’s testing principles. The signs are sufficiently positive that UC will accept scores from the new SAT-R in satisfaction of the University’s core admissions testing requirement.” (BOARS 2003 motion)

Differences Across Demographic Groups: The College Board’s analyses “demonstrate that there are similar patterns of differential validity and prediction by gender, race/ethnicity, and best language subgroups on the revised SAT compared with previous research on older versions of the test”³¹. That is, the SAT-R remains less predictive for underrepresented groups (differential validity) and tends to over-predict freshman GPAs for African American and Hispanic/Latino groups (differential prediction in which earned grades are less than predicted) and under-predict them for women. The analyses find that discrepancies between the SAT-R and subject test scores are more frequent among test-takers for whom English is a second language and tend to favor the subject tests, but this effect is not limited to language tests.

Measuring Mastery of Content: In their responses of 2006, 2007 and 2009, the College Board affirmed that their revisions to the SAT-I “were intended to maintain the high level of predictive validity . . . while changing the test construct to assess concepts that are reflective of what is being taught in today’s classrooms.” Nevertheless, the Board explicitly aims to satisfy national needs and its primary targets are not individual state standards.

Diagnostic and Prescriptive Value: According to the College Board, neither the SAT-I nor the SAT-R has been designed to provide instructionally relevant diagnostic information to students and schools. Nevertheless, the English/language arts teachers and district administrators reported major and mostly positive changes in writing priorities, attitudes, and expectations in the three years after the new SAT Writing section was announced; the changes appear to impact schools and districts regardless of size, location or enrollment diversity³². Any prescriptive or diagnostic

³¹ Mattern et al., 2008

³² Noeth, R. J., and Kobrin, J. R., 2007, Writing changes in the nation’s K-12 education system. College Board Research Notes, RN-34.

value to the SAT needs to be sought in the context of the PSAT-SAT-AP test spectrum and the Board's College Readiness System. The PSAT provides feedback for identifying AP-ready pupils and SAT study plans. The "SAT-In Focus" suite of tools (including "My SAT Online Score Report" and "SAT Skills Insight") provide deeper insight into a student's academic strengths and weaknesses to help focus college preparation. The College Board reports that "feedback . . . from high school counselors and teachers on this tool has been extremely positive."

Predicting Success: The College Board's analyses confirm that the SAT-R is a good predictor of college freshman GPA and that combining SAT scores and high school GPA is the best predictor. Agronow and Studley (2007) found the SAT-R scores to be a little more effective in the prediction of UC GPA than the corresponding older combination of SAT-I (Math and Verbal) and SAT-II Writing. The addition of SAT Subject test scores to the new SAT-R test provides very little additional value in predicting freshman GPA. In this study, the variance explained in freshman GPA increases only from .282 for combined high school GPA and SAT-R to .284 when subject tests are added (increases for engineering students are from .271 to .284, respectively, when subject tests are added).

The College Board's analyses find that the new SAT-R writing section has the most predictive power of the three test sections. We note, however, that an MIT writing director has criticized the scoring of the new writing component on the basis that scores are strongly correlated with mere length in all the samples provided. The National Council of Teachers of English Teachers have expressed concern that good writing habits involve revising, not writing within a time limit.

As a measure of second year retention, the College Board reports that 95.5% of high SAT scorers continue into second year whereas 68.3% of low SAT scorers do not. For college course placement, results of a soon-to-be-released College Board study "indicate that [New] SAT scores are correlated with [post secondary] mathematics and English course grades."

Social and Monetary Costs: The College Board reports that one in five California test-takers have a fee waiver for the \$45 test, compared with one in nine nationally. The SAT provides up to two fee waivers to low income students. BOARS' consultants confirm that students can be coached, to advantage, for both the old and new SAT, that repeat testing improves performance, and that neither test captures the abilities of students who do not test well, although a May 2009 National Association for College Admission Counseling report concludes that, on average, test prep courses yield only a modest benefit. It found that SAT coaching resulted in about 30 points in score improvement on the SAT, out of a possible 1600, and less than one point out of a possible 36 on the ACT.³³ Coaching among some students and not others disadvantages low-income groups and distracts participants from college preparatory coursework.

4.4. The ACT-with-Writing

The ACT, administered in the 11th and 12th grades, is one test in "a system of longitudinal, curriculum-based assessments beginning in 8th grade and continuing through high school and post-secondary education"³⁴. Before the new core tests were implemented, BOARS was already satisfied with the proposed ACT-with-Writing:

³³ <http://www.nacacnet.org/AboutNACAC/PressRoom/2009/Pages/TestPrep.aspx>

³⁴ ACT response to BOARS, 2009

“Based on the review of the current ACT test and the plans for addition of a writing sample to the test, we are confident that the ACT (with Writing) will align with UC’s testing principles. We recommend approval of the test in satisfaction of the University’s core admissions testing requirement.” (BOARS 2003 motion)

The ACT had always been more a curriculum-based test of subject-mastery than the SAT and its sections have a wider scope. In addition to proficiency in English, mathematics and reading, the ACT has a core subject area in science. The content of the subject areas is based on analysis of all published state objectives for grades 7-12 and ACT’s National Curriculum Surveys. Currently about 30% of UC applicants provide ACT test scores.

Differences Across Demographic Groups: ACT Inc’s analyses reveal that their test scores show the same persistent differences between racial/ethnic groups as other test scores, high-school GPA, and college graduation rates. “Those factors that benefit student achievement, as measured by the ACT Composite, do so for all students, irrespective of racial/ethnic group membership”³⁵. The positive relationship between ACT test scores and course-taking in mathematics and science holds for all test-takers regardless of family background and high-school³⁶.

Both ACT scores and high school GPA tend to over-predict the freshman college GPA’s of Hispanic and African American students. Because the effect is twice as large for high school GPA, the combination with ACT scores is the better predictor³⁷. Combining the new Writing score with the core English score reduces the score differences between African-American and Caucasian American examinees, between Hispanic and Caucasian American examinees, and between low- and high-income examinees. The relative standings of the comparison groups do not always change, however, because the standard deviation of the English scores is larger³⁸.

Measuring Mastery of Content: The content of the four core subject areas is based on analysis of published objectives for grades 7-12 and ACT’s National Curriculum Surveys. Various ACT Inc. reports document that completion of a related and rigorous set of college preparatory high school courses does lead to higher ACT test scores and increased probability of meeting ACT Inc.’s benchmark minimum scores that predict passing grades in college courses. On average, students who take four years of English courses and three years each of mathematics, science, and social studies score 2.5 scale points higher than those who do not take the courses³⁹. Students who complete foreign language courses in addition to English in grades 9-11 score, on average, 1.1 units higher on the ACT English. The average ACT mathematics scores increase systematically by up to 3.2 points with the scope of the mathematics and physics courses taken beyond Algebra 1. Similarly, the science scores are better by up to 4.0 points for students taking increasingly broad suites of specific science courses rather than General Science (ACT policy report, 2005)

Prescriptive and Diagnostic Value: The ACT is the last in a sequence of three curriculum based assessments administered in the 8/9th, 10th and 11-12th grades. The earlier tests can provide

³⁵ ACT response to BOARS, 2009, citing Noble et al., 1999, 2001, 2006

³⁶ Noble et al. 1999

³⁷ ACT technical manual, 2007

³⁸ ACT response to BOARS, 2009

³⁹ ACT high school profile report 2008

useful feedback to students concerning coursework and preparation for College. ACT Inc. publishes College Readiness Standards “which are those skills and knowledge needed to be successful in entry-level college courses and which relate an examinee’s scores on the ACT tests to the specific sets of skills and knowledge the examinee is likely to possess.”⁴⁰ ACT Inc. determines minimum test score benchmarks, by subject area, that predict a 50% likelihood of a B or better and a 75% likelihood of a C or better in the corresponding college courses. ACT examined the value of the Writing scores for college course placement prior to implementing the test. Their study of students in English Composition courses at ten colleges found that the combination of ACT English and Writing scores was a better predictor of B-or-higher grades than either score alone⁴¹.

Predicting Success: ACT Inc. recommends that college admission be based on test scores in combination with high-school grades. They consider high-school grades to be “subjective, non-standardized and therefore inaccurate measures of achievement” but suggest that the grades incorporate other important dimensions of student success. This is their justification for using both of two highly correlated measures. As a predictor of college retention into the second year, they find ACT scores and high-school GPA to carry comparable weight. ACT Inc.’s Alumni Outcomes Survey supports higher weight for high-school GPA as a predictor of final undergraduate GPA, while ACT scores carry more weight in the prediction of the highest degree achieved.

ACT Inc. seems marginally better able than the College Board to make correlations between test scores and individual college course grades. This enables insightful analysis of the predictive value of the added Writing component. As a predictor of grades in writing-intensive college courses, the new component adds power to the core English component, but the English score is a stronger predictor (standardized weight 0.24) than the new Writing score (weight 0.15). High-school English grades contribute the most weight (0.254) when all three are used in prediction, followed in weights by the traditional English score (0.153) and the new writing score (0.118)⁴².

4.5. Comparison of Scores for SAT-R and ACT-with-Writing Tests

For 9,529 enrollees in fall 2006 who presented both SAT and ACT scores, the two tests are highly correlated⁴³. Pearson correlation coefficients are 0.87 for SAT and ACT math scores and 0.76 for SAT and ACT writing scores. The SAT critical reading scores correlate strongly with both ACT english (0.78) and ACT writing (0.79) scores. For both core tests, the reading and writing components have the strongest correlation with freshman UC-GPA. All component scores on both core tests are correlated with parental education levels (correlation coefficients 0.39-0.47) and parental income (0.25-0.29). Again, the reading and writing scores have the strongest correlation. Freshman UC-GPA is notably less strongly correlated with parent education and income (0.17 and 0.27).

4.6. Other Tests

The SAT Subject Tests are naturally more incisive than the old omnibus core tests; they are more focused and better aligned with the high school ‘a-g’ curriculum. Some of their predictive power

⁴⁰ ACT response to BOARS, 2009

⁴¹ IBID

⁴² ACT response to BOARS, 2009

⁴³ UCOP report to BOARS, March 2009

is now transferred with the writing component of core tests. Subject test scores are valued by some majors and professional schools – particularly scores in mathematics – and can be applied during selection. By requiring subject tests for eligibility, however, the University places a higher burden on prospective students than most competitive colleges. BOARS believes that this is an undesirable barrier. The higher level AP and IB test scores are optional and already used to substitute for lower division college courses, but AP/IB preparation is far from uniformly available across all portions of the state.

As a result of the drive toward content standards for high school courses, many pupils already take other more curriculum-based tests without fees or special coaching. Although not aligned solely to the college-preparatory portion of the curriculum, these test scores could approach the predictive utility of the current core tests. A study by Agronow and Horn (manuscript available to BOARS in 2010) compared the California Standards Tests (CST) and the SAT. The tests are similarly successful predictors of freshman GPA for students attending UC. The CSTs are better aligned to California high school course content, generate more diversity among high scorers, and cost less. Currently it is not lawful to use these tests for college admissions purposes. Should the legal barriers be lifted, there would remain difficult issues to resolve concerning the timing of the tests and the test-taking milieu. National admissions tests are a high-stakes exercise for all test-takers. For some students the standards tests are a low-stakes exercise and we cannot foresee all the consequences of mingling low-stakes and high-stakes test-taking groups.

4.7 Summary

The ACT has always been curriculum-based by design. The subject-based components of the ACT allows a better alignment with the University's 'a-g' course pattern than can be expected of the SAT-R. The new SAT-R was made more instructionally sensitive by ensuring questions are relevant to the curriculum and similar to those encountered in the classroom. Both the SAT-R and the ACT-with-Writing are designed to measure abilities that are predictive of future college performance, subject to the constraint that a limited number of questions must be answered in a limited time period.

Test designers must balance local principles against the need to satisfy a national clientele. This precludes maximizing alignment with the curriculum standards and content of any one state or providing optimally predictive and diagnostic information for any one school system or college. Within the constraints of this tension, both ACT Inc. and the College Board have made good faith efforts to meet the diagnostic and predictive principles by embedding their core tests in a series of grade level assessments.

Neither the ACT-with-Writing, nor the SAT-R have escaped the persistent differences between racial/ethnic groups that are characteristic not only of the older test formats but also of other test scores, high-school GPA, and college graduation rates. Other components of an application that might replace the predictive power of the core test scores would not escape these uneven impacts. High school GPA has less adverse impact on disadvantaged groups and is the better predictor of student retention over time.

5. THE OVERSIGHT OF ADMISSIONS TESTING

The 2002 BOARS report recommended that

“as a matter of principle, the faculty regularly reviews UC’s admissions testing policy and practices to ensure that tests are being used in a way that is consistent with these principles and desired properties of admissions tests.”

BOARS has been engaged continually in two monitoring activities that encompass admissions tests. Each year’s admissions outcomes are examined to determine the success of the process in admitting from the top 12.5% of the state’s high school graduates and to monitor the fairness of the process in securing statewide representation. Concerns arose concerning the exclusionary consequences of the SAT subject test requirement and the insensitivity of the eligibility cut-off index. As mitigation, BOARS redesigned the admissions process to widen the ELC pathway and replace the abrupt eligibility cut-off with criteria that would entitle applicants to a comprehensive review of their entire files. Since the debut of the redesigned core tests, BOARS has been continually examining the growing body of statistics appropriate for determining to what extent the revisions achieved better alignment with the Testing Principles.

6. REPORT SUMMARY

6.1. Main Findings:

- The University uses admissions tests in a manner consistent with the principles concerning the use of tests. The multiple pathways of admission allow test scores to provide alternate access for some applicants without being a barrier to others.
- The new SAT-R and ACT-with-Writing core tests comport better than their predecessors in relation to the University’s principles for test properties. They are better aligned with the ‘a-g’ curriculum and have somewhat greater predictive power, which may be attributed to writing and computational components incorporated from Subject tests.
- For general eligibility rating, the core tests have power to predict college freshman GPA that is comparable with that of high school GPA; in combination with high school GPA, they add a small but notable increment of predictive power.
- For comprehensive review and admission by exception, the general redundancy of test scores and high school GPA provides a means to recognize anomalous files that warrant closer review and to evaluate non-traditional transcripts.
- No national norm-referenced core admissions test is likely to be able to satisfy all the Testing Principles.
- Although the new tests are arguably better connected to school curricula than their predecessors, they remain brief, comprehensive, and norm-referenced, by design; they are taken late in the K-12 curriculum, so their utility for prescriptive feedback depends primarily on fore-runner tests to which they are linked; they contribute to the escalating burden of test-taking, and they are unlikely to be able to escape the persistent lower test scores on under-privileged groups.
- Subject tests have the advantage of better curriculum alignment and may still have some advantages in predictive power for students in engineering, but they are hard to reconcile with principles of fairness across demographic groups and social cost. They are more likely than the core test requirement to become a barrier instead of an alternative means of gaining access to the University. Subject test scores have a legitimate role in

comprehensive review and as one means to satisfy the ‘a-g’ course-taking requirement of the eligibility threshold.

6.2. The Key Question for Future BOARS analyses

- Do the SAT-R and ACT-with-Writing core tests augment the prediction of college success well enough in the eligibility ratings stage of admissions, or provide a large enough fairness bonus to some individuals in the selection stage, to justify the social and financial burden that test-taking imposes upon the entire applicant pool?

6.3. Recommendations

1. The Board of Regents should remove the provisional status of the SAT Reasoning Test.
2. BOARS will update its 2002 Testing Principles to include the following principle that reinforces the role of the current use of admission test scores:

“to increase the options available for applicants to demonstrate their preparedness for college.”

In addition, the BOARS Testing Principles should explicitly prefer tests that are not only curriculum-based but also scored by reference to achievement standards.

3. After the first cohort of students that submitted the new core tests graduates in 2010-11, BOARS should analyze four-year outcomes for comparison with the Geiser and Santelices (2007) study.
4. Given that the ACT test is the more curriculum-based of the current core tests, UC should signal to applicants that it finds the ACT more aligned with ‘a-g’ coursework and high school curriculum than the SAT-R test, and increase the number of California high school students who take this exam.

6.4. Anticipating Future Initiatives

In the course of this analysis BOARS considered a recommendation to eliminate the core testing requirement. We recognize the financial burdens of test-taking, but because the core test scores still add to the fairness of the admissions process, at both the general and individual levels, we do not recommend such a step at this time. We expect that this suggestion will be raised again and can anticipate three other likely initiatives that BOARS’ future analyses of admissions outcomes should examine:

- Not all of the University’s admissions pathways rely on core test scores, and in 2012 the SAT Subject tests will become optional. BOARS should weigh the consequences of adopting the practices evolving among the growing number of four-year colleges that have made the core test optional.
- The Eligibility Index was implemented at time when comprehensive review was not practical at all campuses. After the introduction of ETR for fall 2012 freshman applicants and the implementation of some level of shared review, BOARS should consider whether shared holistic scores render the eligibility index redundant, how the 12.5% target might be managed via holistic scoring, and how holistic scores might achieve the public perception of simple fairness and transparency currently enjoyed by the eligibility index.

- Although there are prohibitive barriers between California Standards Tests and the needs of college admissions, BOARS should be an interested party in any conversations about the possibility that curriculum-based state-wide testing could be designed to satisfy both curriculum standards and college eligibility.

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APPENDIX I: MILESTONES IN CENTRALIZED ADMISSIONS TESTING AND UC'S USE OF THE SAT AND ACT

Note: Casual inspection of documents is likely to reveal different dates for the same changes in admission policy concerning tests because there may be as many as four associated dates: the dates of proposal and adoption of new a policy, the date on which applicants first take a test pattern in accordance with that policy, and the quarter for which the first students arrive at the University via the new policy.

- 1788: The Kingdom of Prussia, which had instituted one of the first free, public education systems, introduced the *Abitur*, a system of subject examinations culminating in AP-like finals that determine high-school graduation and college admission.
- 1808: France introduces the *baccalauréat*, a suite of essay-format and problem-set subject tests required to enter university.
- 1868: The Organic Act charges the University to be representative of all portions of the State of California and gives it accrediting authority over high schools.
- 1884: The Regents delegate to the faculty the authority to determine admissions standards. The admission by exception (AxE) pathway is begun.
- Jun 17, 1901: The College Board is established to administer a subjectively graded, curriculum-based, essay exam with several different subject sections.
- 1918: The precursor of the GCE A-level subject tests is established for college admission in the British education system.
- Jun 23, 1926: The College Board introduces the Scholastic Aptitude Test – a measure of analytical ability, designed for objective scoring, to replace curriculum-based essay exam. It reflects a North American fascination with IQ. The German, French and British education and college admission systems, by contrast, still favor batteries of curriculum-based exams, that have evolved from subject tests established in 1788, 1808, and 1918 respectively, and more closely resemble the American Advanced Placement Tests.
- 1930s: The College Board introduces multiple choice, subject specific Achievement Tests, later known as SAT-II's or Subject tests. An essay is required only in the Writing Test.
- 1939: BOARS is established.
- 1958: Academic Assembly declines to adopt BOARS recommendation to use the SAT-I, because it added so little to the predictive value of the high-school GPA.
- 1959: ACT debuts as a four subject achievement test – English, mathematics, social science and natural science. It does not have the depth of coverage of the European subject test batteries or the AP tests.
- 1960: The Master Plan for Higher Education charges UC to draw from the top 12.5% of the state's public high school graduates. Initial studies by the California Postsecondary Education Commission in the late 1950s found that nearer 15% were achieving eligibility.
- 1962: Discontinuance of an admission pathway that admitted the top 10% by high school was required to meet the 12.5% eligibility target.

- February 1965: BOARS' fall 1963 achievement test study reports that admissions tests offer marginal improvement over high school GPA in predicting freshman grades.
- 1968: To return to compliance with the 12.5% eligibility cap and expeditiously rank-order students, the Academic Assembly adopts BOARS' recommendation to require SAT-I and three SAT-II tests. The total SAT-I + II score provides a cut-off for applicants with a GPA below 3.1. BOARS reasoned that the change adds a significant improvement over the best single predictor (GPA) of academic success and reduced inequities in school grading standards.
- 1977: The ACT is accepted as an alternative to the SAT-I.
- 1979: A sliding scale of SAT-I or ACT scores is applied as an Eligibility Index to applicants with a GPA below 3.29. SAT-II test-taking remains an eligibility requirement.
- 1983: CPEC begins counting "potentially eligible" applicants who met the high school course and GPA requirements but failed to complete the full pattern of required admissions tests.
- 1988: Regents' policy (RE 28) seeks "to enroll on each of its campuses a student body that demonstrates high academic achievement or exceptional personal talent, and that encompasses the broad diversity of backgrounds characteristic of California."
- 1989: The ACT subject areas are redefined – English, mathematics, reading and science.
- 1990: The College Board changes the "A" in SAT from Aptitude to Assessment.
- 1990: CPEC no longer includes potentially eligible applicants.
- 1994: Revisions of the SAT-I verbal section increases the importance of passage reading; the mathematics section increases its scope and adds some questions without a multiple-choice format.
- July 20, 1995: Regents approve SP-1 eliminating use of race, ethnicity and gender in decisions about admission, effective 1998, while endorsing goal of diversity in student body.
- November 1996: Proposition 209 approved, banning affirmative action in all state agencies.
- 1997: BOARS examines CPEC study of 1996 eligibility rates.
- September 1998: FairTest publicizes the merits of test-optional admissions.
- 1998: BOARS recommends re-incorporating SAT-II scores, weighting them twice the SAT-I in the Eligibility Index, and applying the Index to all GPAs.
- 1999: Eligibility in the Local Context is adopted by the Regents for the top 4% of graduates in each high school by GPA.
- 2001: Regents approve Dual Admissions Program (DAP).
- February 18, 2001: UC President Richard Atkinson calls for elimination of the SAT-I Reasoning Test in favor of tests that assess mastery of specific subject areas. The motivations are inclusiveness, fairness, and avoiding controversial notions of aptitude.

- Fall 2001: Eligibility in the Local Context (ELC) implemented.
- November 2001: BOARS previews its response at a UC conference; ACT Inc. and the College Board announce that they will attempt to develop tests to satisfy UC's requirements.
- January 31, 2002: BOARS' 18-page discussion paper "The Use of Admissions Tests by the University of California" establishes Testing Principles and provides a template for a new testing array – a core examination and two subject exams.
- 2002: A study commissioned by BOARS (Geiser and Studley, 2002) finds that admissions tests offer a modest incremental gain over high-school GPA for predicting freshman GPA, that SAT-II subject tests are more powerful than the SAT-I core test, and that there is substantial redundancy in requiring both.
- 2002: ACT Inc. publicizes its intent to add an optional writing assessment in 2004-05; the College Board establishes three test-development committees, one for each part of the new SAT.
- February 2003: Academic Council asks BOARS to work with ACT Inc. and the College Board to develop tests for implementation in June 2005 for the 2006 entering class.
- Spring, 2003: The College Board surveys high school and college teachers to determine compare actual course contents with SAT content criteria.
- March 18, 2003: BOARS approves the revised SAT (provisionally) and ACT-with-Writing as means to satisfy the core admissions testing requirement; BOARS commits to collect data and evaluate the new tests under development no later than 2008.
- April, 2003: Council unanimously approves BOARS transition plan in which the 2006 freshman class will meet the core test requirement by ACT with Writing or the new SAT.
- July 17, 2003: The Regents pass a resolution affirming that "Approval of tests shall be determined by the Board of Admissions and Relations with Schools, with the concurrence of Academic Council and the Assembly of the Academic Senate. The minimum scores acceptable shall be determined by the Board of Admissions and Relations with Schools, and may vary depending upon the overall grade-point record of the applicant."
- November 2003: President Dynes charters an Eligibility and Admissions Study Group.
- 2004: Funding for DAP removed from 2004-05 State budget; DAP admission pathway suspended.
- April 9, 2004: The Eligibility and Admissions Study Group issues a [final report](#) recommending that BOARS examine the policy of admitting students from the full range of the eligibility pool and report to the President and The Regents on the benefits and consequences of this approach.
- October 28, 2004: BOARS drafts an update of the January 2002 paper to clarify and amplify the desired curriculum-based, diagnostic and prescriptive characteristics of the new tests in order to provide criteria for judging a test's suitability.
- March 12, 2005: New SAT-Reasoning test replaces SAT; (the roman numerals introduced in 1993 with the descriptors "Reasoning" and "Subject" tests, had been dropped in 2004).

- March, 2005: One of MIT's directors of undergraduate writing notes high correlation between scores and mere length of the essays released as examples by the College Board.
- March 2005: BOARS approves the Testing Subcommittee's framework for the development of a new Statewide Eligibility construct for fall, 2006 that would reflect the new admissions testing requirements while still reproducing essentially the same group of students that were eligible under the previous index.
- May 2005: BOARS approves a "Resolution on the Failure of the National Merit Scholarship Program to meet the Requirements of UC's Definition of Merit" and issues letters to campus admissions committees to notify them of the results of the investigation and to request that all UC campuses reconsider any admissions preferences they may be giving to applicants solely because of their designation as National Merit Scholars.
- May 2005: A report from the National Council of Teachers of English criticizes the new writing test.
- June 6, 2005: BOARS considers how to address curriculum-alignment in admissions tests.
- June 22, 2005: Academic Council concurs with BOARS' finding that "the available evidence is insufficient to support the use of standing in the National Merit Scholarship Program either for determining UC admission or for offering merit-based scholarships at UC".
- April 14, 2006: BOARS reviews a UCOP analysis of freshman applicants who applied to UC for fall 2006 admission and did not submit official test score reports for all required standardized tests. Demographic analyses of applicants with missing test scores show that applicants who are first-generation, from underrepresented ethnic groups, in lower GPA ranges, or from low API schools, were less likely to have completed their test score reports. Applicants from rural schools have slightly higher rates of missing scores, both for the ACT and SAT core tests and the SAT-II subject tests; applicants from suburban schools have the lowest rates of missing test scores. Applicants who are missing at least one official test score have consistently lower scores than the freshman applicant pool.
- June 16, 2006: BOARS sends a set of questions to the College Board concerning the design of the new tests and their alignment with BOARS' Testing Principles.
- August 22, 2006: The College Board replies to BOARS.
- August 31, 2006: College Board press release announces launching of *EXCEerator* program in 11 selected high schools "to improve graduation and college readiness rates – particularly for low-income and minority students . . . The model is designed to dramatically increase enrolment in advanced courses such as AP courses . . ."
- October 2006: BOARS commits itself to a fundamental eligibility reform effort, focusing on ways to expand the pool of students who are visible to UC and eligible for comprehensive review beyond those now deemed UC-eligible.
- Fall 2006: UC welcomes the first freshman class admitted via the new test requirement.
- November 2006: BOARS reviews two papers and four UCOP analyses regarding eligibility reform. One for underrepresented minority students examining proportions of gaps due to within-school and between-school differences for completion of 'a-g' courses; taking the SAT-II; and applying to, being admitted to, and enrolling at UC. They suggest that for

African-Americans, failing to take the required SAT-II examinations is a primary factor in not attaining eligibility. The analyses of high school grading differences show that correlations between GPA and API decrease when controlling for SAT-II scores and socioeconomic factors. Students in academically stronger schools tend to receive higher grades, and unweighted grades in honors level courses tend to be higher than unweighted grades in regular courses. BOARS notes that caution should be used when evaluating grades as an achievement measure since a student's socioeconomic status seems to be a factor even in unweighted grades.

- December 2006: BOARS reviews: 1) Saul Geiser and Roger Studley, "UC and the SAT: Predictive Validity and Differential Impact of the SAT-I and SAT-II at the University of California"; and 2) Kyra Caspary and Sam Agronow, UCOP Admissions Research and Evaluation, and David Stern, draft "A Comparison of Measures Including School Percentile Ranks, Awards, Grade Trend and AP Exams in the Prediction of UC GPA." BOARS notes that among those high school students that complete the 'a-g' requirements for UC freshman eligibility, failure to fulfill the SAT-II examination requirement is the most common reason for these students not attaining UC-eligible status.
- 2007: Geiser and Santelices report that high school GPA is the best predictor, not only of freshman GPA, but also of 4-year outcomes, and has less adverse impact than standardized tests on disadvantaged and underrepresented minority students.
- January 26, 2007: Memorandum from BOARS Testing Subcommittee Chair Jennifer Chacon summarizes prior history and suggests a discretionary task: "to assess the role and appropriate weight for tests in the admissions process."
- January – May 2007: BOARS reviews several key UCOP analyses examining factors from the application beyond those currently used for eligibility and their ability to predict UC success. Along with other regression analyses, they show that the added power of SAT scores to predict UC GPA and persistence is of minor significance. Using an applicant's complete high school record in a more context dependent manner is a more effective way to judge a student's potential for UC success. BOARS discusses possible modifications to the current examination requirement and decided to recommend eliminating the SAT-II Subject exam requirement while maintaining a core exam requirement, noting that UC is the only public institution that requires subject exams; that approximately 1/3 of California high school graduates take the SAT core examination while less than 15 percent take the SAT-II Subject exam; and that elements of the two most predictive subject exams – the SAT-II Writing and Math, have been integrated into the new SAT-Reasoning Test.
- April 2007: BOARS Testing Subcommittee meets to review sample tests of the old and new versions of the SAT, sample essays from the new Writing portion of the SAT exam.
- May 2007: BOARS unanimously endorses the UC Freshman Eligibility Reform proposal, and votes to forward it to Council with a request for systemwide review.
- August 2007: Testing Subcommittee meets by teleconference with two experts: Drs. Sheldon Zedeck (UCB) and Rebecca Zwick (UCSB). (summarized in Chair Chacon's Sept 27 memo).
- September 27, 2007: Outgoing chair of BOARS testing subcommittee Jennifer Chacon offers tentative conclusions for discussion; Daniel Weiss succeeds as subcommittee chair.

- October 16, 2007: UCOP's first analysis of New SAT-Reasoning Test as a predictor of UC GPA (Agronow and Studley CAIR report).
- November 2007: BOARS reviews a UCOP report – “Examining the Predictive Value of SAT Subject Exams in the Prediction of First Year UC GPA – a Report to BOARS” – which examines the relative value of the new SAT test pattern in the prediction of UC GPA, and focuses especially on the value of the new SAT Subject test requirements in the prediction.
- December 7, 2007: College Board officials Laurence Bunin, Wayne Camara, Ida Lawrence, and Jim Montoya, meet with BOARS to discuss the SAT and changes made to the SAT-In 2005; the College Board's view of the benefits of the SAT and the SAT subject tests to UC; and their view of potential consequences of eliminating the SAT subject tests as a UC admissions requirement. The presentation by the CB focused primarily on the SAT-R and its utility in response to the Testing Principles, BOARS noted that there were no new arguments presented in relation to the SAT subject tests that had not already been considered.
- December 2007: The systemwide Senate review of BOARS' eligibility reform proposal concludes and Council asks BOARS to address questions and concerns raised by reviewing agencies.
- January 2008: BOARS sends follow-up questions to the College Board. The College Board replies. BOARS agrees, by a vote of 8 in favor, 2 opposed, to include in the revised eligibility reform proposal the elimination of the SAT-II tests as a requirement for UC eligibility.
- February 2008: BOARS votes to support the revised eligibility reform proposal by a vote of 10 in favor, 0 against, and 1 abstention.
- March 2008: BOARS examines profiles of UC Eligible Applicants in comparison with Ineligible Applicants.
- June 11, 2008: Academic Assembly votes 38 to 12 to approve eligibility reform. The proposal enlarges the ELC pathway, removes the SAT-II test-taking pattern from eligibility determination, and replaces the Eligibility Index cut-off with a broad band (ETR) that is entitled to comprehensive review of the entire file.
- September, 2008 BOARS appoints its 2008-09 Testing Subcommittee, Peter Sadler chair.
- December 12, 2008 BOARS sends supplementary questions to College Board.
- January 9, 2009: BOARS examines a preliminary comparison of the predictive power of the California Standards Tests with SAT tests (Agronow and Horn paper).
- January 14, 2009: College Board replies to BOARS.
- March 16, 2009: BOARS requests information from ACT Inc.
- April 23, 2009: ACT Inc. responds to BOARS with a letter and 25 supporting documents
- May 1, 2009: BOARS considers draft outline of report on New SAT and admissions tests.
- October-December 2009: BOARS reviews and approves report on the new SAT and admissions tests.

APPENDIX II: THE ADMISSIONS TESTS AND THEIR ACRONYMS

The Test Referencing Methods from FairTest, August 17th 2007

<http://www.fairtest.org/criterion-and-standards-referenced-tests>

<http://www.fairtest.org/files/norm-referenced-tests.pdf>

NRT: Norm-referenced tests compare test-takers to each other and calibrate scores to percentiles. Half of all test-takers are always below median.

CRT: Criterion-referenced tests measure whether test-takers have mastered a specific body of knowledge, typically the curriculum of a course or set of courses. It is possible that all test-takers pass.

SRT: Standards-referenced testing is a recent variant of CRTs that are based on a set of content standards, which prescribe what a course should teach, or performance standards which define levels of proficiency that a student should attain.

The Tests:

<http://www.actstudent.org/writing/index.html>

<http://www.collegeboard.com/student/testing/sat/about/SATI.html>

<http://www.fairtest.org/facts/univtestcomparison.html>

<http://www.startest.org/cst.html>

ACT: A 3.5 hour curriculum-based achievement test from ACT Inc. The ACT is the last in a series of three related assessments “designed to assess students’ general educational development and their ability to complete college-level work. The multiple-choice tests cover four skill areas: English, mathematics, reading, and science. The optional Writing Test is a 30-minute essay test that measures students’ writing skills in English. The tests emphasize reasoning, analysis, problem solving, and the integration of learning from various sources, as well as the application of these proficiencies to the kinds of tasks college students are expected to perform. In addition to providing a composite score and scores for each of four skill areas, the ACT also provides two sub-scores in English, three sub-scores in mathematics, and two sub-scores in reading. Two scores are reported if students take both the English Test and Writing Test: a combined English/Writing score and a Writing Test sub-score. ACT also provides some comments about each student’s essay.”

[\[http://www.act.org/aap/infosys/index.html\]](http://www.act.org/aap/infosys/index.html)

Cost (2008-09): \$31.

ACT-with-Writing: Adds an optional 30 minute essay test that cannot be taken without first taking all four ACT multiple-choice tests in the same session. A writing score and a combined score is provided. Cost (2008-9): \$46.

Obsolete SAT-I (Verbal and Math): A 3-hour aptitude-type test of critical reading and problem solving developed by the Educational Testing Service and administered by the College Board. It was scored in two parts: verbal reasoning and math reasoning.

New SAT-Reasoning Test (“SAT-R”): The SAT-R is a 3-hour and 45-minute test of critical reading, mathematical reasoning, and writing skills, with a 25 minute essay section that is always the first question. It is offered 7 times a year in the U.S and 6 times abroad.

The College Board describes its SAT-R test as “the benchmark standardized assessment of the . . . skills students have developed over time and that they need to be successful in college. Each year, more than two million students take the SAT. Nearly every college in America uses the test as a common and objective scale for evaluating a student’s college readiness.”
[\[http://professionals.collegeboard.com/testing/sat-reasoning\]](http://professionals.collegeboard.com/testing/sat-reasoning)

Changes from SAT-I were designed to better reflect what students are learning in high school and to include writing. The writing component was imported with modifications from the SAT-II. The changes from the old Verbal and Math components are minimal by comparison. The New SAT-Remains a norm-referenced test in which test items are selected to maintain a target spread of scores among students, not by reference to content standard. The content has changed but the scores are normed to the same statistical criteria. The Critical Reading section (formerly SAT-I Verbal) has 19 sentence completions and 48 paragraph-based reading questions; it is less a vocabulary test, more a reading test; analogy questions from the old verbal section were eliminated. The Mathematics section (formerly SAT-I Math) has 44 multiple choice questions and 10 student-produced answers; the old quantitative comparison questions were eliminated; more algebra 2 material added (i.e. 3rd year college-preparatory math). The Writing section (new, from SAT-II Writing) has a essay and closed choice items. For each section a score is reported that ranges from 200 to 800, together with state and national percentiles. Sub-scores are reported for the multiple choice and essay sections of the writing portion. The size and structure of the Mathematics and Critical reading sections are unchanged and these scores are equivalent to the old SAT-I.

SAT is developed to reflect accepted educational standards. On average, students answer 50 to 60 percent of questions correctly; 80 percent finish nearly the entire test. Almost all students complete at least 75 percent of the questions.

Cost: \$45

SAT Subject Tests: One-hour multiple choice achievement tests of mastery of subject matter in writing, two levels of mathematics, and about 20 other subjects (formerly known as CEEB Achievement Tests and SAT-II Subject tests).

California Standards Tests: CSTs are a major component of the Standardized Testing and Reporting (Star) program. They measure students’ progress toward achieving state-adopted academic content standards for each grade and subject tested. Grades two through eleven take multiple-choice tests for various subjects. Grades four and seven complete a writing assessment as a part of the language arts test.

APPENDIX III: NOTES ON “CURRICULUM-BASEDNESS”

BOARS’ 2004 update provides a definition of a “curriculum-based” test as “one that measures the content knowledge and cognitive skills that are expected to be taught and learned in college preparatory curricula.” It recommends that “admissions tests certified as curriculum-based must have evidence that:

- the expressed purpose of the test maker is to produce a curriculum-based test;
- the writing and selection of test questions follows, as opposed to precedes, the specification of test standards that include a description of what subject matter topics and cognitive skills should be taught and learned in college preparatory curricula;
- the questions written and selected for the test verifiability and representatively sample the most important subject matter topics required by UC’s ‘a-g’ requirements;
- the questions written and selected for the test are pitched at all levels of cognitive demand, ranging from the recall of facts and basic calculations, to higher order problem solving, to application of subject-matter knowledge to new and unfamiliar situations, to the correct interpretation of data and information;
- the subject matter knowledge and cognitive skills measured by the test are publicly articulated and predate the construction of test items;
- curriculum-based knowledge and skills, rather than preset statistical score distributions and trend data, determine test content and the format of questions written and selected for the test.”

For empirical evidence of validity for curriculum-based tests, the 2004 update suggests:

- “students that perform well on the test also perform well academically at the university
- “students who complete a required college preparatory curriculum and perform well also do well on the test as opposed to those that do not take such a curriculum or do so but perform poorly in class;
- “a student can study for a test and do well on it, not so much by paying for coaching and test-taking programs, but by mastering college-preparatory subject matter; and
- “score results on the test are presented in ways that validly and fairly indicate the degree to which ‘a-g’ subject area knowledge were learned.”

To satisfy the desired diagnostic and prescriptive functions of admissions tests, it suggests:

- There must be clear descriptions of the curriculum-based knowledge and skills that the test is designed to measure and that these are expressed as learning outcomes. Teachers and students should be able to identify and understand each learning outcome and relate this to their college preparatory curricula.
- The learning outcomes measured by the test are appropriate in importance and number to accepted knowledge of college preparation. There should not be too many outcomes because this prohibits reliable measurement . . . At the same time, too few learning outcomes may fail to address important college preparatory knowledge and skills. . .
- Test scores are reported in a way descriptive of the curriculum-based knowledge and skills that a student has or has not mastered. . . Both correct and incorrect responses have significance. . . .

2006-08 BOARS Chair Mark Rashid’s June 2006 memo poses two questions regarding curriculum-alignment and suggests where answers might be sought: 1) What are the cognitive skills and content knowledge? (An answer might best be sought in California’s standards-based curriculum as tested by the California Standards Tests (CSTs) which are standards-referenced, not norm-referenced.) 2) How can we judge whether a particular test actually measures mastery of these skills and knowledge? (We can determine the test-construction methods, consult experts, examine sample tests, and conduct statistical studies of outcomes.)