



# POLICY BRIEF

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## State Standards, the SAT, and Admission to the University of California

Michal Kurlaender,  
University of California Davis

Eric Grodsky,  
University of Minnesota

Samuel J. Agronow,  
Saint Mary's College of California

Catherine L. Horn,  
University of Houston

### Policy Brief 11-3

Michal Kurlaender is Associate Professor in the School of Education at the University of California, Davis. Her work focuses broadly on education policy and evaluation.

Eric Grodsky is Associate Professor of Sociology at the University of Minnesota. Grodsky seeks to understand the dimension and causes of racial/ethnic and socioeconomic inequality in educational achievement.

Samuel J. Agronow is the Director of the Office of Institutional Research at Saint Mary's College of California.

Catherine Horn is an Associate Professor in the Educational Psychology Department at the University of Houston. She is also the associate editor of the *Review of Higher Education*.

State systems of public education are under enormous pressure to increase curricular alignment across grade levels and assess student mastery of state endorsed standards. The increasing focus on common core standards has led to an important policy discussion about the need to better align K-12 systems with higher education, to ensure a more seamless transition for young adults between high school and college. Although states have approached this effort differently, they have been fueled by a clear goal of the common core standards: aligning high school curricula with college and work expectations.<sup>1</sup> An important piece of that policy discussion is an effort to rethink how the assessments built into states' accountability systems can further support alignment between K-12 and higher education.

Like most other universities in the country, the University of California (UC) requires that students submit scores from either the SAT or ACT exams as part of their application package. These tests have their origins in the efforts of a handful of elite colleges and universities to expand the socioeconomic diversity and enhance the academic promise of their admissions pools; to reduce the number of tests students must take to apply to college and the burden this places on both

### Executive Summary:

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*Continued on page 2.*

### Executive Summary (Cont.)

students unfamiliar with the steps they must take to gain admission to a competitive college, and is disconnected from the content and performance standards for state K-12 educational systems.

In an increasingly K-16 policy environment, it is important to consider whether and how tests used to monitor the progress of students through secondary education might serve as a substitute for college entrance exams in the college admissions process. This analysis provides important evidence for reconsidering the decision to privilege college entrance exams over state mandated standardized exams for purposes of college admissions at public universities. The analysis in this brief reveals that the CST exam (required for all California high school students in the 11th grade) offers remarkably similar levels of predictive power in determining college performance, and persistence at UC, to that of the SAT.

prospective students and postsecondary institutions; and to provide a means of comparing students who attend different schools with potentially different grading standards. Despite the appeal of a nationally standardized college entrance exam, critics have asserted that standardized college entrance exams (and the SAT in particular) suffer from several important flaws. These critics argue that the SAT does a poor job of predicting success in college con-

ditional on student high school grades, is biased against women and underrepresented minorities, is coachable and thus advantages more affluent families who can afford to pay for test instruction, imposes an additional hurdle on first-generation college students unfamiliar with the steps they must take to gain admission to a competitive college, and is disconnected from the content and performance standards for state K-12 educational systems. The scope of these critiques would seem to leave little ground for compromise between proponents and detractors of college entrance exams. Universities sufficiently sympathetic to claims made by testing critics typically let students opt not to report their entrance exam scores, but this leaves them in the undesirable position of either relying on entrance exam scores they seem to believe are flawed, or ignoring standardized test data entirely in their admissions decisions.

In *Equal Opportunity in Higher Education: The Past and Future of California's Proposition 209*, researchers Samuel Agronow (formerly at the University of California Office of the President) and Catherine Horn (University of Houston) offer another way forward. Agronow and Horn argue that state-mandated tests could serve as preferable substitutes for the SAT. While the tests are still standardized, and thus provide a means of comparing students from widely disparate high schools, they impose no added burden on students and are tightly linked to K-12 standards. Using data from the University of California Office of the

President and the California Department of Education, Agronow and Horn demonstrate that the California Standards Tests (CSTs) predict freshman grades and persistence into the second year at the University of California (UC) about as well as the SATs, and that high scorers on the CST are slightly more representative of the population of test takers than are high scorers on the SAT. This brief summarizes that work to help frame a policy discussion about streamlining college admissions in public higher education systems.

### Background and Context

Testing (often with high stakes attached) is ubiquitous at both the K-12 and postsecondary entry levels (Amrein & Berliner, 2002; Grodsky, Warren, & Felts, 2008; Lemann, 1999). Typically, however, the tests on which secondary and postsecondary systems rely have remained separate in their purposes and uses. High school end-of-course exams define what is important to learn and teach, and can arguably act as motivators for students on the path for further schooling. In contrast, college entrance exams serve as a way of measuring “future promise independent of past opportunity” (Crouse & Trusheim, 1988, p. 24).

The recent drive to adopt state standards at the K-12 level has been reinvigorated by the emergence of the Common Core State Standards (adopted by 46 states at the time of writing). This wave of standards has developed alongside rhetoric at the state and federal levels arguing for substantially increasing the number of college graduates in

## How Do the Tests Compare?

The SAT reasoning test comprises three sections: critical reading, mathematics, and writing. As described by the College Board (2008), the overarching intent of the exam is to measure “the critical thinking skills students need for academic success in college—skills that students learned in high school.... It tells students how well [test takers] use the skills and knowledge they have attained in and outside of the classroom—including how they think, solve problems, and communicate” (n.p.). Students begin the exam with a 25-minute essay followed by seven 25-minute and two 20-minute testing sections (College Board, 2008). Formerly labeled the verbal section, critical reading measures sentence completion (19 items) and passage-based reading (48 items) (College Board, 2008). The mathematics sections of the SAT reasoning test are made up of 44 multiple-choice and 10 student-produced responses intended to measure “mathematics topics up through a third-year college preparatory course” (College Board, 2008a, n.p.). The writing section includes closed choice items and an essay.

The California Standards Tests (CSTs) are a series of multiple-choice tests taken by students attending public school across grades 2-11 in a variety of subjects. The exams are part of a mandatory Standardized Testing and Reporting Program

(STAR) and are intended to “measure progress toward California’s state-adopted academic content standards, which describe what students should know and be able to do in each grade and subject tested” (Educational Testing Service, 2008, n.p.). The English-Language Arts exam, common to all test takers, is administered in the 11th grade. The test gives approximately equal weight to reading comprehension, literary response and analysis, and writing strategies. Additional items measure word analysis, fluency, and systematic vocabulary development as well as language conventions.

In contrast to the English-Language Arts exam, science and math CSTs are targeted at completion of particular courses and are thus not common across the population of eleventh grade students. California offers four math exams at the high school level: Algebra I, Geometry, Algebra II, and summative math. The Algebra II items almost exclusively measure in detail the specific content for that domain while the summative math test measures Algebra I, geometry, and Algebra II concepts. Each test also assesses students’ understandings of probability and statistics. As a result of the University of California’s (a-g) course requirements, virtually all students eligible for admission to the University will have taken either the summative math or Algebra II exam. The science exams in the CST high school battery include biology, chemistry, and

physics.<sup>2</sup> Finally, course-specific U.S. and world history exams each use 60 items to measure a variety of clustered content areas.

How similar is the content measured by the CST subject tests to that of the analogous SAT assessment? In general, the SAT uses fewer items to measure a more generalized set of content domains. In cases where content does clearly overlap, the CST subject tests consistently evaluate a deeper level of understanding. There are also proportional differences in the weights given to various content areas. While broadly similar, Agronow and Horn note that there are a multitude of small (and potentially consequential) content differences between CSTs and the SAT. Their goal is to better understand whether this state-mandated test that is required of all high school juniors in the state of California and measures the state’s content standards might be useful for admissions purposes at the University of California (and perhaps elsewhere).



the United States, yet these two broad-based policy initiatives are curiously disconnected. Despite increased policy focus on college readiness, states now assess students' performance on K-12 standards with no apparent bearing on students' postsecondary careers. The only tests that seem to matter for higher education are those administered nationally by the College Board or ACT.

There has been growing interest in the possibility that seemingly disparate educational systems of secondary and postsecondary schooling might be better connected, particularly through the assessment process. The rationale for improving the alignment of exams across the secondary and postsecondary levels is that in taking courses and assessments that build toward college-level academic work, high school students can become better informed about and better prepared for the requirements of college (Callan et al., 2006, p. 8). Vi-Nhuan Le (2002) analyzed the alignment of various exams administered to secondary school students and entering college freshmen in five states. She found that much overlap exists in what is measured across the various tests, and that the many small differences relate primarily to the variation in test purpose.

### Data Analysis and Results

Agronow and Horn obtained data for the CSTs from the California Department of Education (CDE) for students applying for admission to the University of California (UC) in the 2006-07 academic year. CDE matched

UC applicant information to student test scores using students' names, birth dates, various demographic variables, and school of attendance. CST scores are available only for students who attended California public high schools.<sup>3</sup> The analysis includes CST scores for 11th grade English, the higher score on Algebra II or Summative Math in 11th Grade<sup>4</sup>, the higher score on U.S. History or World History, and the highest score on Biology, Chemistry, or Physics. Selection of the "highest" of these scores mirrors the process used by UC as well as by most admissions professionals in choosing SAT/ACT scores (i.e., the highest SAT or ACT scores taken at one sitting). They also consider three components of the SAT Reasoning Exam (Critical Reading, Math, and Writing) as well as two SAT subject tests.<sup>5</sup>

Data available in the UC database and used in the analyses include scores on SAT exams; weighted-capped high school grade point average<sup>6</sup>; Academic Performance Index (API) of the high school; and self-reported demographic variables like parent income, parent education, first language spoken at home, gender and racial/ethnic group. All of these measures, save racial/ethnic group, are used in the UC admissions process. Agronow and Horn include race/ethnicity in these analyses to maximize predictive validity controlling for as many relevant observable factors as possible.

How related are the CSTs and the SATs? Utilizing a standard measure of association, a correlation coefficient where

0 suggests no association and 1.0 suggests a perfect association, Agronow and Horn note the correlation between the CST score in English and the SAT Critical Reading score is 0.71. The CST score in English correlates at 0.64 with the SAT Writing; and the correlation of the CST score in Math with the SAT Math is 0.77. By all conventional standards these correlations are substantial, but they also suggest that the CSTs and SATs either measure slightly different constructs or have different error properties.

To further examine the correspondence between these two tests, Agronow and Horn look at the overlap in scores on the SAT and CSTs. They divide the population of 33,360 UC applicants who took both the SAT and CST into quintiles based on their combined SAT math and critical reading scores and cross classify them by their combined scores on the CST English and Summative Math tests. In other words, how does doing well on one test relate to doing well on the other? Table 1 shows the relationship between the sum of SAT Critical Reading and Math and the sum of CST English and Summative Math for UC freshman applicants who have both. The overall correlation between these scores is 0.80. Just under half of all students represented in this table achieved scores in the same combined CST quintile as they did in the combined SAT quintile. About equal shares of students scored one quintile higher on the CST than they did on the SAT (20.5 percent) and one quintile lower on the CST than they did on the SAT (19.6 percent).

**TABLE 1:** The Relationship between California Standards Test (CST) English and Summative Math Scores and SAT Critical Reading and Math Scores for 2006-07 UC Freshmen Applicants

SAT reading and math							
		400-1040	1050-1150	1160-1240	1250-1340	1350-1600	Total
Sum of CST English and summative math	Less than 690	13.2%	4.4%	1.4%	0.4%	0.1%	19.6%
	691-741	4.8%	7.5%	4.9%	1.9%	0.3%	19.4%
	742-788	1.2%	5.2%	7.3%	5.1%	1.6%	20.4%
	789-846	0.3%	2.0%	5.2%	7.7%	5.2%	20.4%
	847 or more	0.0%	0.3%	1.6%	5.3%	13.0%	20.2%
<b>Total</b>		<b>19.6%</b>	<b>19.4%</b>	<b>20.4%</b>	<b>20.4%</b>	<b>20.2%</b>	<b>100.0%</b>

When Agronow and Horn compare characteristics of students scoring in each of the top three quintiles of the SAT to those scoring in the corresponding quintile on the CST English and Math (combined) they find that, in general, top scorers on the CST English and Math are slightly more likely to be from underrepresented minority groups (African American, or Chicano/Latino), low performing high schools, and first-generation and low-income families than are top scorers on the SAT. This suggests that the top end of the CST distribution more closely mirrors the population of high school students in California than does the top end of the SAT distribution.

The primary purpose of the SAT as an admissions tool is to predict college success, typically as evidenced by first year grades and persistence in college. To determine how well the CSTs fare as a predictor of college success Agronow and Horn fit a variety of multiple regression models to predict UC GPA after one year of enrollment and persistence into the second year at UC. They utilize different speci-

cations and control for a variety of variables from students' application files, including gender, race/ethnicity, first language, citizenship, parental income, parental education and the Academic Performance Index (API) of the student's high school of origin as a measure of secondary school quality. This allows Agronow and Horn to better understand how well each of these tests predicts student success, holding constant important demographic characteristics.

With only test scores and high school GPA in their models, Agronow and Horn find that the SAT model explains about 28.6 percent of the variation in freshmen GPAs at UC and the CST model explains about 26.7 percent of the variation in freshmen GPAs at UC. This suggests that the SAT may be a slightly better predictor of first year grades than the CST, though the difference may not be of great substantive importance. However, upon controlling for additional student and school characteristics, the gap in explanatory power is narrowed to *0.001*, an insig-

nificant difference. See Table 2 for more detailed results.

Turning to prediction of persistence into a second year at UC in 'good standing' (with a UC GPA of 2.0 or above), Agronow and Horn find that neither the SAT nor the CST is a very effective predictor. Importantly, the difference in the predictive power between the CST and SAT for persistence measures is negligible. Of course UC students are a selective group and have very high persistence rates. An analysis of students attending less selective public institutions (such as the CSUs) may find more evidence for divergent predictive power across these different tests.

In sum, the analysis suggests that CST exam scores are no better or worse at predicting freshman year GPA at UC than are the SATs. Why might this be the case? One reason may be that the CST exams measure depth of subject matter knowledge across a variety of exams. While there is some content overlap between what is measured on the SAT and what is measured on the CSTs, the more comprehensive subject-

**TABLE 2:** Comparison of SAT Reasoning with California State Standards Exams (CSTs) in prediction of UC GPA after one year of matriculation (standard errors in parentheses)

	All Applicants		Applicants with SAT History and Science	
	Reduced	Full	Reduced	Full
<b>SAT Reasoning Test Models</b>				
Critical Reading	0.083 *** (0.006)	0.066 *** (0.006)	0.008 (0.025)	-0.009 (0.025)
Math	0.012 * (0.005)	0.010 (0.006)	0.019 (0.022)	0.015 (0.022)
Writing	0.110 *** (0.006)	0.077 *** (0.007)	0.081 *** (0.023)	0.058 * (0.023)
History			0.043 (0.025)	0.049 * (0.025)
Science			0.077 ** (0.026)	0.077 ** (0.026)
Weighted, Capped HS GPA	0.193 *** (0.004)	0.200 *** (0.004)	0.169 *** (0.017)	0.177 *** (0.019)
<b>R-Squared</b>	<b>0.286</b>	<b>0.312</b>	<b>0.282</b>	<b>0.312</b>
<b>California Standards Test (CST) Models</b>				
English/Language Arts	0.082 *** (0.005)	0.045 *** (0.005)	0.068 *** (0.019)	0.050 * (0.019)
Math <sup>1</sup>	0.034 *** (0.005)	0.033 *** (0.005)	0.059 ** (0.019)	0.052 * (0.020)
History <sup>2</sup>	0.063 *** (0.005)	0.070 *** (0.005)	0.041 * (0.019)	0.047 * (0.020)
Science <sup>3</sup>	0.033 *** (0.006)	0.019 *** (0.005)	0.050 * (0.020)	0.035 (0.020)
Weighted, Capped HS GPA	0.191 *** (0.004)	0.190 *** (0.004)	0.186 *** (0.017)	0.192 *** (0.018)
<b>R-Squared</b>	<b>0.267</b>	<b>0.311</b>	<b>0.264</b>	<b>0.304</b>
N	18,029	18,029	1,154	1,154

**NOTES:**

<sup>1</sup>Best of Algebra 2 or Summative Math

<sup>2</sup>Best of World History or US History

<sup>3</sup>Best of Biology, Chemistry or Physics

\* p <.05, \*\* p<.01, \*\*\* p<.001

Reduced Models include only weighted, capped high school GPA and the SAT or CST scores respectively.

Full models add sex, race/ethnicity, first language, citizenship, parental income, parental education, and the high school Academic Performance Index or API.

Coefficients are standardized on the independent variables and can be interpreted as the change in GPA for a one standard deviation change in x. One possible critique of these findings is that the comparisons are not fair because SAT Subject Tests are not considered in the model, while CST subject exams in science and history are included. UC currently requires two subject exams, though typically between 62 percent and 65 percent of students choose the subject exam in math. We show a comparison of predictive validity of the SAT with CST for the same subject area tests (history and science) for a greatly reduced sample of students (N = 1,154) on the right-hand side of table 1. When we add the SAT Subject Tests in history and math to SAT I and high school GPA, the multiple R-square was 0.282, compared to a multiple R-square of 0.264 for the CST exams. However, when we include all of the control variables, the difference in the multiple R-square narrows to 0.008, 0.312 for the full SAT model, and 0.304 for the full CST model.

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specific information gathered by the CST might allow for a richer understanding of student performance helpful in anticipating college classroom performance. A second related reason may be the burgeoning relationship between the K-12 and UC communities that has fueled a steady improvement in the alignment of curricular expectations for college entry (e.g., a-g courses; partnerships between campuses across levels). To the extent that CST exams are a good measure of whether or not students have met these expectations, it is not surprising that they also would be reasonable predictors of college success. Despite some discrepancies, the content measured by SAT exams compared with the most closely analogous CST exams is not markedly different.

The SAT Writing component remains the most important predictor of first year GPA among the SAT exams in the general population of UC enrollees. Agronow and Horn argue that adding an assessment of writing to the CST may bolster the CSTs ability to predict UC grade point average. Although not included in their analysis, the 11th grade CST does in fact include an optional writing component. Scores on the essay section of the Early Assessment Program (EAP)<sup>7</sup> might enhance the predictive power of the CSTs for undergraduate grades and persistence. The EAP is designed primarily to assess whether or not potential CSU students are at risk of needing to complete remedial coursework should they apply to, and attend, a CSU. Regardless of the predictive validity of the EAP writing assessment for grades and persistence

at the University of California, however, the fact that in 2010 84 percent of students eligible to participate in the English EAP did so is strong evidence of the feasibility of administering a state-wide writing assessment.<sup>8</sup>

### **Implications for Policy**

Most colleges and universities continue to use student scores on standardized tests to inform their understanding of the academic strengths of applicants with a broad range of secondary school experiences. In an increasingly K-16 policy environment, it is important to consider whether and how tests used to monitor the progress of students through secondary education might serve as a substitute for college entrance exams in the college admissions process. This analysis provides important evidence for reconsidering the decision to privilege SAT college entrance exams over state mandated standardized exams for purposes of college admissions at public universities. Agronow and Horn's analysis reveals that the CST exam (required for all California high school students in the 11th grade) offers remarkably similar levels of predictive power in determining college performance, and persistence at UC, to that of the SAT. This is particularly true when CSTs are combined with a writing component.

### ***Strengthening the Ties between K-12 and Postsecondary Schooling***

Mandatory state achievement tests are closely aligned with state K-12 standards. The CSTs are designed to assess student mastery of the academic standards agreed to by educators and

policy makers in the state of California (Educational Testing Service, 2008), so they are more closely aligned with state standards than the SAT. To the extent that these standards are also aligned with the expectations of postsecondary success, public colleges and universities should reward students who meet and exceed the standards set by the state Board of Education, not merely those set by testing agencies such as the College Board, ETS, or ACT. Perhaps the most important reason for considering the adoption of high school exams like the CST for the purposes of postsecondary admission is to better align the need of the K-12 community to evaluate its high schools with the need of the university community to evaluate its applicants for admission. Colleges and universities should work with K-12 to align expectations so that students receive clear signals about college preparedness without experiencing testing overload. Students believe that if they do well in high schools (earn good grades, pass necessary exams, etc.) then they will get into a good college and succeed there, but that is often not the case. High rates of remediation across all non-selective public colleges and universities suggest that students often receive inconsistent messages from their high schools and from colleges. As states seek to strengthen alignment between K-12 schools and postsecondary education, standards taught and tested in the K-12 years should provide the necessary information to evaluate college readiness and success. Using exams like the CST is a first step down the road to a stronger connection between the public secondary and



postsecondary systems, in which it may no longer be necessary for the SAT to play such a dominant role.

### ***Reducing Costs***

In addition to improving the alignment between K-12 and postsecondary schooling that this approach affords, substituting scores on the state standards test would also offer significant cost savings to citizens of the state. The CSTs are taken free of charge (to the individual) and during the regular school day by virtually all elementary and secondary students attending public schools in California. Taxpayers already pay a lot of money to develop, maintain and administer tests of academic achievement. At 45 dollars apiece, the total cost for taking the SAT to the 114,400 students who were eligible, based on grades and coursework, to attend a California State University campus in 2007 would have been over 5 million dollars; the cost to the 46,400 UC eligible students would have been 2.1 million dollars.<sup>9</sup> In a time of such tight individual and state budgetary constraints, all consumers (students, their parents, and members of both the K-12 and higher education community) would hope that the relationship between high school education and university curricular demands be more seamless in order to further reduce costs.

### ***Efficiency***

Consumers might ask why it is necessary for students to take the SATs and other exams external to the high school curriculum. State tests are mandatory; every student attending public school

in California automatically has a score on the state standardized tests. Similar to the College Search Service offered by the College Board, public colleges and universities could use these test scores to reach out to students urging them to use their senior year of high school to better prepare for college. Unlike the College Board's service, however, they could do so at almost no cost (save the added administrative burden of reporting test scores to colleges and universities). Finally, removing the SAT requirement would eliminate yet another hurdle that stands between disadvantaged and first-generation college students and college attendance.

### ***Increasing Diversity***

Relying on state achievement tests rather than the SAT could also increase the diversity of UC and CSU applicant and admission pools with respect to race/ethnicity and socioeconomic origin. Those whose test scores placed them in one of the upper three quintiles of the CST were more diverse in terms of ethnicity (higher percentages from Chicano-Latino, African American and Asian/Pacific Islander groups), had lower incomes, were from less educated families and were more likely to come from low API high schools than those who earned test scores in the corresponding quintile of the SAT. The CST, in other words, appears to be less affected by the socio-economic background of the test takers than the SAT, a fact that is also borne out by the simple correlations of these socio-economic measures with SAT and CST scores. The educational advantages afforded by higher socio-economic status exert

less of an influence on the CST than they do on the SAT.

### ***Cautions and Conclusions***

The empirical work summarized in this brief shows that the 11th grade California Standards Tests (CSTs) perform quite similarly to the SAT in predicting students' academic success in college. The one exception is in writing, where the essay component of the SAT still offers important explanatory power above and beyond the other components of the test. However, recent additions to the state standardized test as part of the voluntary California Early Assessment Program include a writing component, which should be further assessed as a tool for enhancing the predictive power of these publicly funded assessments.

Substituting state standardized tests for the SAT is a very attractive option but several important questions remain unanswered. The CSTs were not designed for the purpose of college admission, and as such we really don't know how they would perform when, or if, implemented with this in mind. Increasing the stakes of the CSTs would lead more secondary schools to teach to the test, an outcome that would be desirable if the test effectively captures the skills and knowledge outlined in the state standards, but regrettable if the instruction were reduced to test taking strategies rather than subject matter. Moreover, using the CSTs in university admissions makes them more "high stakes" for students (as opposed to using them primarily in K-12 schools) who would thereby



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transfer their stress about SAT performance to CST performance. But in our opinion, when the CST is used responsibly by both educational communities, its benefits greatly outweigh any and all shortcomings.

A recent brief by Achieve suggests that one of the key strategies for improving K-12 and postsecondary alignment, is in “building anchor assessments that have credibility and utility with higher education.”<sup>10</sup> Existing state assessments in K-12 may have some distance to go to obtain the necessary credibility among the higher education community, but we believe their great utility in meeting the fundamental demands of colleges and universities to determine who to admit has been regrettably overlooked. The research we summarize here suggests that, at minimum, the SAT could become an optional component of the UC admissions process. Not all of the students whom UC would like to enroll take the 11th grade CSTs. Making submission of SAT scores optional would reduce the burden on many students, while still allowing students to submit SAT/ACT scores if they prefer.

The state currently spends substantial public dollars to evaluate its public education systems; shouldn't we demand more from those assessments? Moreover, utilizing required state assessments for college entry may further efforts to better align K-12 with higher education by sending stronger signals to students and public schools, easing also the burden of college

entrance protocols on students and their families.

## Endnotes

- <sup>1</sup> For additional information see: [www.corestandards.org](http://www.corestandards.org).
- <sup>2</sup> The biology exam assesses student knowledge in five content areas, with genetics representing almost one-third of the tested material. The chemistry exam covers a broad range of content areas within the domain and fairly evenly distributes measurement of those areas. Finally, the CST physics test measures proficiency in: motion and forces, conservation of energy, and three additional areas.
- <sup>3</sup> Agronow and Horn were able to match 47,147 of the 59,458 California public high school applicants to the applicants' CST scores for a match rate of 79.3 percent. Of the 30,457 students from California Public High Schools who enrolled at UC in 2006-07, 23,369 (76.7 percent) had CST scores in 11th Grade English. Of these 23,769, 18,029 also completed one year at UC (the group studied in the regression analyses). Less than five percent of UC Applicants who took the CST also took the SAT Subject Exams in both History and Science.
- <sup>4</sup> Though CST exams in Algebra I and Geometry were available to the authors, only the CST exams in Algebra II and Summative Math (in eleventh grade) were employed in the analysis.
- <sup>5</sup> At the University of California only the two highest scoring SAT subject tests a student takes are used in admission decisions. The most commonly submitted SAT subject tests are in Mathematics (Level 2), and in U.S. History.
- <sup>6</sup> Weighted-capped high school GPA adds an extra grade point for up to 8 semesters of UC approved honors, AP, IB, or college level courses with grades of C or better. Typically the highest value of this GPA is 4.40.
- <sup>7</sup> In 2004, the California State University, in conjunction with the California Department of Education and the State Board of Education, introduced the Early Assessment Program, which aims to identify students' need for remediation at CSU based on their performance on a set of items included in the 11th grade CST in conjunction with an additional 15 test items for math and an additional essay for English/language arts. All 11th grade students are eligible to take the English EAP, while the math EAP is limited to students who are enrolled in or have completed Algebra II.
- <sup>8</sup> Public Affairs, California State University. 2010. "Record Number of High School Juniors Take College-Ready Assessment Test." 2011. Long Beach: California State University. Available at:

<http://www.calstate.edu/pa/News/2010/release/EAP.shtml>.

- <sup>9</sup> California Postsecondary Education Commission Data. Available at: <http://www.cpec.ca.gov/>.
- <sup>10</sup> Strategies for K-12 and Postsecondary Alignment, Achieve June 2010. Available at: <http://www.achieve.org/files/StrategiesforK-12andPostsecondaryAlignment.pdf>.

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Policy Analysis for California Education  
School of Education, Stanford University  
520 Galvez Mall  
CERAS Rm. 401  
Stanford, CA 94305-3084  
(650) 724-2832

<http://www.edpolicyinca.org>

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