Assessing the Promise of California's Early Assessment Program for Community Colleges

By
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This article focuses on California's efforts to improve the alignment between K–12 and postsecondary schooling through the Early Assessment Program (EAP). Implemented in 2004, the EAP was designed to give high school students information about their academic preparedness for postsecondary education and to encourage teachers to teach for college readiness. I describe the EAP and its evolution and presence at California's community colleges. I then match EAP and other test score data for California high school juniors to administrative data from California community colleges to investigate the extent to which high school student participation in the EAP predicts their college course placement and influences their academic performance. I find that very few students enter the California community college system ready for college-level work based on the EAP exam, but that the EAP can better serve community college campuses in their efforts to place students in developmental coursework.

Keywords: K–12; postsecondary alignment; community college; college readiness

The discrepancy between students' K–12 academic preparation and the demands of postsecondary schooling has been well documented (as described in Perna and Armijo, this volume), and is at the heart of the Common Core State Standards movement. Federal

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funding under Race to the Top created two consortia to organize states in their attempts to improve K–12 and higher education alignment through clear standards and new assessments. Currently, forty-six states have adopted these common standards and are working on implementing them.

Responsibility for improving college readiness falls primarily at the state level. Many states have implemented initiatives to improve students' pathways from K–12 into and through higher education (National Center for Public Policy and Higher Education 2009). For example, several states have raised curricular standards of high schools to better align with postsecondary entrance requirements. Venezia and Jaeger (2013) report that by 2015 nearly half of all states and the District of Columbia will have a default high school curriculum that includes four years of English and math; and at least three years of science, social science, or both. Michigan, for example, in 2006 adopted a comprehensive set of high school graduation requirements known as the Michigan Merit Curriculum. These requirements were designed to increase the rigor of high school course-taking and better prepare Michigan students for postsecondary success (Dynarski et al. 2012).[1] Evaluating the evidence from existing efforts is critical, particularly in light of the implementation of Common Core State Standards.

This study focuses on California's efforts to improve college readiness through the Early Assessment Program (EAP). The EAP is an intervention designed to increase the quality of information about academic preparedness available to high school students. The purpose of this analysis is to understand how an increase in information about college readiness while in high school affects outcomes for students enrolled in California's 112 community colleges. The study addresses the following two research questions: Is EAP participation associated with improved outcomes among students enrolled at community colleges? and Is EAP participation predictive, above and beyond existing state standardized tests, of how high school juniors will fare at community college in terms of course placements and academic performance?

Research and Policy Context

Given the high number of students who require remediation upon college entry, it is clear that the U.S. secondary school system does not align well with the expectations of colleges and universities (Hoffman, Vargas, and Venezia 2007; Kirst and Venezia 2004).[2] Why? Some fault the "wasted" senior year, during which many students experience less rather than more rigor in their academic program (Kirst 2000; National Commission on the High School Senior Year 2001). Others suggest that state performance standards are different from those required of students in higher education (Venezia et al. 2005). Still others point out that the current K–12 accountability regime has focused on meeting basic competency, for example in high school exit exams, perhaps at the expense of meeting the expectations of postsecondary schooling (Strong American Schools 2008; Achieve Inc. 2004). Recent policy efforts, such as Common Core State

Standards, aim to more explicitly address the misalignment between K–12 and postsecondary schooling.

Another explanation for the misalignment between high school and college may be the limited information students possess regarding what will be required of them to succeed in college (Conley 2010). A majority of high school students—regardless of their academic performance—report that they will attend college. In fact, academic performance accounts for little of the variation in students' expected levels of educational attainment, suggesting that students' actual grades in school often do not correlate with their educational expectations (Reynolds et al. 2006). Despite a "college for all" culture, students, particularly those who would be the first in their family to attend college (that is, first-generation college students), often have little understanding of what it takes to succeed in higher education (Venezia and Jaeger 2013; Settersten and Ray 2010; Rosenbaum 2001; Deil-Amen and Rosenbaum 2002; Conley 2005; Venezia, Kirst, and Antonio 2004). Moreover, standards for academic success can vary widely between high school and college, and across colleges. This variation poses a significant challenge to students and policy-makers, the consequence of which is a great deal of confusion and even ignorance among students about the academic demands of college.

The consequences of misalignment are largely borne by individual students who may experience discouragement from college placement exams and the additional developmental coursework necessary to catch up to college-level courses (Deil-Amen and Rosenbaum 2002; Person, Rosenbaum, and Deil-Amen 2006). However, there are also important consequences for the public, who subsidizes these developmental courses, and for the institutions that have to provide and monitor college readiness assessments, developmental coursework, and other supports (Phipps 1998; Strong American Schools 2008). Moreover, weak alignment between K–12 and postsecondary schooling likely contributes to poor institutional outcomes, such as low retention and graduation rates. In sum, misalignment in college readiness creates inefficiencies for students, institutions, and the public.

Most colleges use a variety of approaches to determine student proficiency for college-level work. At four-year institutions, students can typically demonstrate proficiency using college entrance exams such as the SAT or ACT, or by meeting Advanced Placement (AP) thresholds. When entrance exam scores do not meet proficiency thresholds, students may be given assessments in math and English (reading and writing) to determine course placement (at some campuses these exams are given in addition to entrance exams). Such assessments and placement procedures are standardized in some public higher education systems but are institution- (or even department-) specific at others. Colleges use different assessments and different cutoffs for determining proficiency and the level of remediation necessary (Merisotis and Phipps 2000; Bettinger and Long 2009). At most four-year colleges, remediation takes the form of a one- or two-course sequence in math or English, respectively. At community colleges, however, students may be referred to developmental courses that may be three levels below college-level work (Bailey 2009; Grubb 2001).

Students are often not well informed about the assessment tests and their consequences (Venezia, Bracco, and Nodine 2010). In addition, for a variety of

reasons, many students referred to developmental courses do not complete them. First, some institutions do not force enrollment in developmental courses or make these courses a prerequisite for college-level courses, even for students who are directed into these courses following assessment. Evaluating data from the community colleges participating in Achieving the Dream, Bailey (2009) finds that 21 percent of students referred to developmental math and 33 percent referred to developmental reading do not enroll in these courses within three years of first registration. Second, some institutions, particularly community colleges and other institutions with great demand for developmental courses, do not offer enough sections of developmental skills courses to accommodate all students who need them. Finally, many students who enroll in developmental courses fail to complete them (Jenkins and Boswell 2002).

Assessing college readiness is not easy, and the standardized assessments typically used to place students in remediation have recently come under scrutiny (Scott-Clayton 2012; Scott-Clayton, Crosta, and Belfield 2012). Scott-Clayton, Crosta, and Belfield (2012) find that, although some students placed directly into college-level courses do not have the necessary skills to complete them, many students placed into math remediation could have earned at least a C or B in a college-level math course. Moreover, a growing number of remediation evaluation studies suggest that students placed in remedial/developmental courses rather than college-level courses do no better in performance or attainment (and at times fare slightly worse) than their counterparts doing college-level work (Bettinger, Boatman, and Long 2013; Kurlaender and Howell 2012). The absence of consistent positive outcomes for students just above the proficiency cutoff compared with students just below the proficiency cutoff implies that the assessments used for identifying remediation may not be useful or sufficiently nuanced to measure college readiness (Scott-Clayton 2012).

Common Core State Standards promises to better align high school curriculum with the expectations of college. Much earlier than this recent effort, though, California took strides in 2004 to better align K–12 to one segment of the postsecondary system—the California State University system—through the EAP. With robust political support, several years later the program was extended to the state's community colleges. The program has received much attention in the national conversation about college readiness. Its explicit goals are to improve the extent to which high school students, parents, and teachers are informed about students' college readiness; and to improve the academic alignment of the state's K–12 schools and its public postsecondary institutions, specifically the twenty-three campuses of the California State University system and the California community colleges.

California's Early Assessment Program[3]

The EAP is an academic preparation program developed by the California Department of Education (CDE), State Board of Education, and California State University (CSU); the latter of which is the state's twenty-three-campus,

broad-access four-year public higher education system. The development of EAP was motivated by a desire to increase the English and math proficiency of entering freshmen at CSU campuses, thereby reducing high system-wide remedial course-taking rates.

The three explicit goals of the EAP are to: (1) identify high school students *before* their senior year who need additional coursework or preparation in English and/or mathematics to succeed at a CSU; (2) provide high school students, parents, teachers, and administrators with information about students' college readiness, and then partner to increase the quality of academic preparation; and (3) motivate high school students to take steps in their senior year to achieve readiness for college-level work. The program has three components: testing in the eleventh grade to identify academic preparation; a professional development component to aid high school teachers in facilitating improved college readiness among their students; and supplemental preparation for students in their senior year. All three components of the program are voluntary.

The primary component of the program (and the primary focus of this analysis) is an early assessment of English and math skills for eleventh graders that began in spring 2004. The EAP test consists of fifteen optional multiple-choice questions on the mandatory California Standards Tests (CST) in eleventh grade English and mathematics (and a separate essay in English). These additional test items were developed jointly by CSU and K–12 faculty to reflect both California high school standards and CSU placement standards. Composite scores from the exam are computed based on a subset of forty-five to fifty-five of the existing CST questions augmented with the fifteen additional EAP items and an essay.

Students who elect to complete the additional test items receive a letter the summer before their senior year in high school with one of two main messages in English and math, respectively. If their scores exceed an upper threshold, they are exempt from assessment for remedial coursework at CSU. Students whose scores fall below a lower threshold are considered nonexempt from the remediation placement exams when they arrive as freshmen. (The EAP is not the only way to gain exemption from the CSU placement exam and/or avoid remedial coursework; exemption may alternatively be earned through sufficiently high SAT, ACT, or relevant AP test scores.) While there is only one threshold in English to distinguish the exempt and nonexempt outcomes, the mathematics EAP also includes a middle-range for scores that yields an outcome of exempt conditional on completing certain courses during the senior year in high school with a grade of "C" or higher. (Recent revisions to the EAP have added a conditional exempt set of courses in English that were applied to high school juniors starting in 2012.) Students who do not meet the exemption threshold are advised about what courses to take in their senior year and can access additional resources provided by CSU to improve their readiness for college-level coursework following high school graduation.[4]

What is the evidence on the effectiveness of the EAP on student outcomes? Howell, Kurlaender, and Grodsky (2010) find that the introduction of the EAP reduced English remediation rates of first-time freshmen by about 6 percentage points and by about 4 percentage points in math for participating students at one

CSU campus. More recent evidence exploring EAP effects statewide suggests a similar, albeit more modest, reduction in remediation rates overall, finding a 2 to 3 percentage point decline in remediation (Kurlaender et al. 2013). Additional work on the EAP is investigating the potential mechanisms for these reductions (Jackson 2013), and the impacts of other components of the program. One current study is examining the professional development component focused on expository reading and writing with California high school English teachers. This program component may be particularly important, given that teachers (often under pressure to teach to high school standards) may also be out of touch with college expectations and/or lack the supports to better align their content and instruction to the expectations of college.[5]

In 2008, Governor Arnold Schwarzenegger signed Senate Bill 946, which allowed California's community colleges to implement the EAP.[6] As of January 2013, seventy-one community colleges have indicated that they will accept EAP test results, agreeing to waive local assessment tests for exempt students who score "college ready" on the EAP.[7] At the time of this writing, several other community colleges are in active discussion with their faculty about accepting EAP test results.

The EAP's expansion to community colleges was not seamless (Policy Analysis for California Education 2012). Different public postsecondary systems (such as the CSU and California community college system) are often not well aligned in their expectations or assessments of college readiness. Despite the 2008 Senate bill, EAP take-up at the community colleges has been fragmented, with some colleges adopting the EAP assessments early and others still not accepting them. Moreover, math and English departments across adopting community colleges often handle developmental assessments and coursework differently and have varying levels of support for the CSU-initiated metric for college readiness (Policy Analysis for California Education 2012). Although it may be too early to determine the overall effects of adopting the EAP on the need for remediation at the community colleges, this analysis takes advantage of data on those who participated in EAP as juniors and who ultimately enrolled at community colleges to tease out the potential impacts of the program for the community college system.

Research Design

This analysis employs detailed individual-level administrative data from the California Community College Chancellor's Office and the CDE. Specifically, I match EAP and other standardized test score data for California high school juniors (made available from the CDE) to detailed data about first-year course-taking behavior across the 112 California community colleges (made available by the California Community College Chancellor's Office). Although the EAP was not applied to community colleges until 2010 via State Senate Bill 946, I can observe students' EAP test participation in prior years, and, as such, can assess

the extent to which participation in EAP and EAP test results are associated with students' later postsecondary outcomes.

The analytic sample is constructed through the following steps. First, I limit the sample to students ages 17 to 19 who completed high school. Next, I restrict the sample to those enrolled in two or more nonoccupational courses at the community college. Finally, since California does not have an individual identifier that follows students from K–12 to postsecondary schooling, I match each of the community college records to the CDE dataset of the census of California's high school juniors based on last name, first name, date of birth, high school attended, and cohort, obtaining roughly a 73 percent match rate (consistent with similar studies conducted by the California Community College Chancellor's Office matched to K–12 data). I repeat these procedures for fall freshmen cohorts in academic years 2004/05 through 2008/09. I observe students in their first two terms on the measures described below.

Measures

I examine the influence of the EAP in two ways: participation in EAP in English and math, respectively, and actual EAP exemption status. I also include a set of control variables, including student demographics (e.g., race/ethnicity, gender, and first-generation college student) and prior academic achievement on California's state standardized tests available from the CDE. I also control for cohort affiliation to capture any other temporal dimensions in both EAP participation and community college outcomes.[8]

I explore the potential influence of the EAP on two broad outcomes: course placement and performance. I capture course placement in a multitude of ways: whether units/courses attempted are degree applicable, UC and CSU transferable (i.e., transferable to California's four-year public university systems), and identified as "basic skills" by the Chancellor's Office (i.e., developmental courses in English and math).[9] Academic performance is measured by grade point average (GPA).[10] Table 1 includes the summary statistics (means and standard deviations) for the outcomes explored.

As detailed above, the analytic sample includes five cohorts of first-time freshmen at community colleges that were matched from their junior-year attendance at a California public high school. Students in the sample enrolled in an average of nine courses across their first two terms, and five to six of the courses are UC and/or CSU transferable. Looking at course placement as a percentage of total courses, 69.5 percent and 59.7 percent of courses students enrolled in were CSU and UC transferable, respectively. Overall, about 4 percent of the courses first-time freshmen were enrolled in at California's community colleges are deemed Math Basic Skills and 7 percent are designated English Basic Skills. These relatively low rates of basic skills course-taking do not necessarily suggest that students are, on average, not required to take developmental coursework when they arrive at community college; the percentages also reflect variability in developmental course offerings and compliance across California's 112 community colleges. Students' average first year GPA was 2.21 and was not different for UC/

TABLE 1
Descriptive Statistics of Outcome Measures for Analytic Sample (n = 364,368)

	Mean	Standard Deviation
Total classes		
Overall	9.10	2.58
UC-transferable	5.40	2.66
CSU-transferable	6.31	2.67
Nondegree	1.23	1.68
Math Basic Skills	0.38	0.71
English Basic Skills	0.59	1.04
Percent classes		
CSU-transferable	69.49	23.02
UC-transferable	59.68	24.98
Math Basic Skills	4.45	8.48
English Basic Skills	6.75	11.94
Percent units		
CSU-transferable	69.71	24.38
UC-transferable	60.68	26.11
Math Basic Skills	5.23	10.08
English Basic Skills	7.60	13.28
Grade point average		
Overall GPA	2.21	0.97
UC-transferable GPA	2.24	1.07
CSU-transferable GPA	2.25	1.04
Math Basic Skills GPA	1.91	1.257
English Basic Skills GPA	1.70	1.267

CSU-transferable courses. GPA is, on average, quite a bit lower in courses that are deemed Basic Skills (1.91 for math basic skills).

Analytic strategy

To answer the first research question, I first investigate how many community college freshmen took the EAP as high school juniors, and among those who participated in the EAP, how many reached exemption status in English and math. Next, I present a series of cross tabulations investigating whether the outcome measures differ by EAP participation for math and English.

To assess the extent to which EAP participation may be associated with community college success (the second research question), I fit a series of regression models that predict a host of placement and performance outcomes as a function of EAP participation in math and English, respectively, controlling for students' demographic characteristics, prior achievement, and high school cohort affiliation. Specifically, I fit the following model using ordinary least squares (OLS)

regression, testing the basic relationship between EAP participation and first-year college behavior:

$$Y_i = \beta_1 EAP\_Participate_i + \gamma Z_i + \varepsilon_i \quad (1)$$

where Y_i is the outcome of interest (course enrollment and performance) for student i, $EAP\_Participate_i$ is a binary variable indicating whether a student participated in EAP (in English and math respectively), γZ_i represents a vector of control variables (e.g., students' demographic characteristics, prior achievement, and high school cohort affiliation) for student i, and ε_i is the error term for student i.

Finally, I assess the extent to which EAP test results may provide valuable information for course placements and performance among community college freshmen. I fit a series of models that regress the same course enrollment and performance measures on students' EAP exemption status in math and English, respectively, again controlling for students' demographic characteristics, prior achievement, and high school cohort affiliation, using the following model:

$$Y_i = \beta_1 EAP\_Exempt_i + \gamma Z_i + \varepsilon_i \quad (2)$$

where, Y_i is the same outcome of interest (course enrollment and performance) for student i, now EAP_Exempt_i is a binary variable indicating whether a student got a "college-ready" signal on the EAP assessment in English and math, respectively. For math, I employ a second dummy variable to distinguish between exempt, conditionally exempt, and not exempt. γZ_i represents the same vector of control variables for student i, and ε_i is the error term for student i. This unique dataset, which tracks California students from the K–12 to the postsecondary system, allows me to evaluate the extent to which prior high school achievement tests (in particular EAP, which is validated to identify college readiness) predict academic success at community college.

Findings

EAP participation and exemption outcomes across California's community colleges

Table 2 details the EAP participation and performance outcomes among community college students for each cohort. The table shows that EAP participation in English increased from 46 percent in the first year (2005) of the program to 86 percent by the fifth year of the program. Although the rate of English exemption on the EAP declined some in the early years of the program, EAP participation also nearly doubled over this period and has become more universally adopted among high schools in recent years, thereby attenuating the selection effect of participation.[11]

TABLE 2
EAP Participation and Performance among First-Time Freshmen Attending California Community Colleges

	2005		2006		2007		2008		2009	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Participate in English EAP	26,688	45.94%	34,995	52.18%	42,686	58.58%	67,111	82.02%	72,312	85.55%
Exempt on English EAP	3,973	14.89%	5,804	16.59%	6,912	16.19%	8,318	12.39%	9,849	13.62%
Qualified to take math	26,187	45.08%	31,447	46.89%	35,589	48.84%	41,927	51.24%	45,733	54.10%
Participate in math EAP	18,737	71.55%	21,328	67.82%	25,475	71.58%	29,087	69.38%	31,594	69.08%
Conditional exempt on math	6,835	36.48%	8,211	38.50%	9,451	37.10%	10,918	37.52%	12,395	39.16%
Exempt on math	869	4.64%	1,055	4.95%	1,308	5.13%	1,710	5.88%	2,016	6.37%

In math, students have to meet a level of course-taking in high school to be eligible even to take the EAP exam, and roughly half of all California high school juniors qualify to do so. The percentage of students attending community colleges who were eligible to participate in the math EAP has increased gradually, suggesting that the average, traditional-age first-time freshmen attending a California community college has had increasingly more rigorous math coursework while in high school. Despite increased eligibility, the rates of EAP math participation among community college students have not increased in the first five years of the EAP, fluctuating between 68 percent and 71 percent.

How do EAP math takers do on the exam? Among community college students who were eligible for and took the math portion, between 36 percent and 39 percent obtained a conditional exempt and only 5 to 6 percent obtained an exempt status. In fact, in the entire community college system, very few students enter college with the designation of college ready based on the EAP—about 1,000 in the early years and about 2,000 in more recent years.

EAP participation and student outcomes

To evaluate the extent to which EAP participation is associated with higher-level course placements and performance, I fit a series of regression models for freshmen cohorts 2005–2007, controlling for a variety of student demographic characteristics and high school academic performance. Tables 3 and 4 summarize the results from these models.[12] Each column represents a separate outcome. The top panel looks at the difference in the fraction of courses taken at a community college between those who participate in EAP as juniors and those who do not. The bottom panel looks at differences in first-year GPA at community college associated with EAP participation. To illustrate the "average effect" of participating in the EAP on type of course enrollment, I divide the coefficient by the average sample means, to provide a percentage change at the mean. These are the standardized average differences in each outcome (i.e., the fraction of courses that are UC transferable) by EAP participation at the mean (or for the average student). For GPA, the average effect is best illustrated by comparing the coefficients to their respective standard deviations.

The first panel of Table 3 shows that, compared with those who do not take the English EAP, the average community college student who takes the English EAP has fewer courses that are nondegree applicable (–7.6 percent); more CSU-transferable courses (1.97 percent); more UC-transferable courses (2.54 percent); and fewer English Basic Skills courses (–6.98 percent), controlling for student demographic characteristics and eleventh grade standardized test scores. The second panel of Table 3 shows that students who participate in the English EAP, when compared with those who do not, have, on average, a .06 higher grade point average in nondegree applicable courses, CSU-transferable courses, and UC-transferable courses. These differences, although statistically significant, are very small in magnitude—about one-twentieth of a standard deviation. In English Basic Skills courses, the difference in GPA between EAP test-takers and non-test-takers (about .03) was not statistically significant after controlling for

TABLE 3
Effect of English EAP Participation on Course Placement and Grades

	A. EAP Participation Effect on Fraction of Classes That Are:			
	Nondegree	CSU Transfer	UC Transfer	English Basic Skills
OLS coefficient	–.0109***	.0135***	.0149***	–.0047***
Standard errors	(0.0022)	(0.0022)	(0.0025)	(0.0013)
Average values of outcomes	0.14	0.69	0.59	0.07
Percent change at the mean	**–7.60%**	**1.97%**	**2.54%**	**–6.98%**
Number of students	138,422	138,422	138,422	138,422
R-squared	.223	.227	.218	.149
	B. EAP Participation Effect on Grade Point Average:			
	Nondegree	CSU Transfer	UC Transfer	English Basic Skills
OLS coefficient	**.0583*** **	**.0614*** **	**.0573*** **	**.0257**
Standard errors	(0.0125)	(0.0078)	(0.0082)	(0.0220)
Average values of outcomes	2.12	2.22	2.21	1.69
Standard deviation	1.17	1.04	1.07	1.24
Number of students	48,685	134,767	131,902	45,333
R-squared	.063	.078	.076	.048

NOTE: Control variables: California standardized test scores (CST), CST-squared, gender, race/ethnicity (African American/black, Latino, white, Asian, Other), first-generation college student, cohort fixed effects.
***$p < .001$.

student demographic characteristics and eleventh grade standardized test scores.

Table 4 summarizes the results for EAP participation in math. The first panel shows that the average community college student who takes the math EAP looks similar in course participation to the average student who does not, when controlling for high school characteristics, eleventh grade standardized test scores, and math EAP eligibility. Only one difference is statistically significant: EAP takers enroll in fewer UC-transferable courses (though the difference is less than –1 percent). The second panel of Table 4 illustrates that students who participate in the math EAP, when compared with those who do not, have, on average, higher grades in all types of courses, but these differences—controlling for students background characteristics, prior test scores, and eligibility to take the math EAP—are trivial. This finding may not be surprising given the high threshold necessary even to be eligible to take the math portion of the EAP exam.

The EAP college-ready signal at community colleges

I next evaluate the effect of obtaining a college-ready signal on the EAP (among test-takers) on course-taking and achievement outcomes. Essentially I

TABLE 4
Effect of Math EAP Participation on Course Placement and Grades

	A. EAP Participation Effect on Fraction of Classes That Are:			
	Nondegree	CSU Transfer	UC Transfer	Math Basic Skills
OLS coefficient	.0013	–.0026	–.0062**	.0003
Standard errors	(0.0021)	(0.0025)	(0.0029)	(0.0008)
Average values of outcomes	0.09	0.75	0.66	0.02
Percent change at the mean	**1.47%**	**–0.35%**	**–0.93%**	**1.23%**
Number of students	67,191	67,191	67,191	67,191
R-squared	.160	.194	.170	.099
	B. EAP Participation Effect on Grade Point Average:			
	Nondegree	CSU Transfer	UC Transfer	Math Basic Skills
OLS coefficient	**.0390***	**.0218****	**.0215****	**.0349**
Standard errors	(0.0200)	(0.0100)	(0.0102)	(0.0343)
Average values of outcomes	2.44	2.43	2.42	2.25
Standard deviation	1.13	0.98	1.01	1.23
Number of students	16,908	66,141	65,451	6,504
R-squared	.063	.081	.079	.074

NOTE: Control variables: California standardized test scores (CST), CST-squared, type of math CST taken, gender, race/ethnicity (African American/black, Latino, white, Asian, Other), first-generation college student, cohort fixed effects.
*$p < .05$. **$p < .01$.

compare whether outcomes between EAP test-takers who obtain an exempt score differ from those who receive a nonexempt score. I conduct the comparison for English and math, and in math, also compare those who obtain a conditional exempt score. All models control for students' demographic characteristics and prior academic achievement, as measured by eleventh grade CST scores. The latter control tests whether the EAP exemption offers useful information in predicting course placement and grades, above and beyond California's mandatory test for accountability under No Child Left Behind. Findings from this analysis are summarized in Tables 5 and 6, for English and math, respectively.

In panel A of Table 5, I compare the outcomes of English EAP test-takers who score exempt with those who do not (controlling for demographic characteristics and eleventh grade CST scores). Community college students who obtain an exempt on the EAP as high school juniors have different course-taking patterns than their peers who do not obtain an exempt on the English EAP even when controlling for high school CST scores. Students who obtain an exempt on the English EAP are less likely to enroll in nondegree classes (–7.84 percent) and English basic skills classes (–6 percent) and more likely to enroll in CSU-transferable courses (5.07 percent) and UC-transferable courses (7.26 percent). Panel B shows that students who obtain an exempt on the English EAP, when

TABLE 5
Effect of English EAP Exemption Status (College-Ready Signal) on Course Placement and Grades

A. EAP Exemption Effect on Fraction of Classes That Are:

	Nondegree	CSU Transfer	UC Transfer	English Basic Skills
OLS coefficient	−.0099***	.0360***	.0446***	−.0038***
Standard errors	(0.0010)	(0.0015)	(0.0018)	(0.0006)
Average values of outcomes	0.13	0.71	0.61	0.06
Percent change at the mean	**−7.84%**	**5.07%**	**7.26%**	**−6.00%**
Number of students	175,778	175,778	175,778	175,778
R-squared	.213	.224	.214	.155

B. EAP Exemption Effect on Grade Point Average:

	Nondegree	CSU Transfer	UC Transfer	English Basic Skills
OLS coefficient	**.0258**	**.1760*** **	**.1810*** **	**.0433**
Standard errors	(0.0303)	(0.0083)	(0.0084)	(0.0426)
Average values of outcomes	2.22	2.30	2.29	1.76
Standard deviation	1.16	1.02	1.05	1.25
Number of students	57,936	172,705	169,936	53,256
R-squared	.058	.094	.092	.044

NOTE: Control variables: California standardized test scores (CST), CST-squared, gender, race/ethnicity (African American/black, Latino, white, Asian, Other), first-generation college student, cohort fixed effects.
***$p < .001$.

compared with those who are not exempt, have, on average higher grades in CSU- and UC-transferable courses (about 0.18 higher, or the equivalent of about one-sixth of a standard deviation), controlling for student demographic characteristics and eleventh grade standardized test scores.

In math, I compare nonexempt students on the EAP to both exempt students and conditionally exempt students (Table 6). EAP exemption in math is associated with slightly higher rates of CSU transfer (2.66 percent) and UC transfer (2.52 percent) courses, lower (but not statistically significant) rates of nondegree course-taking (−1.02 percent), and much lower rates of Math Basic Skills course-taking (−12.49 percent) compared with EAP nonexempt students and controlling for demographic characteristics and other measures of academic ability. However, students who obtain an exempt on the math EAP, on average, have grades that are comparable to those of nonexempt students.

Panel C of Table 6 shows differences in course-taking between conditionally exempt and nonexempt students on the math EAP. Conditionally exempt students average higher rates of CSU and UC transfer courses (about 3.0 percent) and lower rates of nondegree course-taking (−3.18 percent) and Math Basic Skills

TABLE 6
Effect of Math EAP Exemption Status on Course Placement and Grades

6A: EAP Exemption Effect on Fraction of Classes That Are:

	Nondegree	CSU Transfer	UC Transfer	Math Basic Skills
OLS coefficient	–.0009	.0202***	.0168***	–.0028***
Standard errors	(0.0024)	(0.0041)	(0.0048)	(0.0009)
Average values of outcomes	0.09	0.76	0.67	0.02
Percent change at the mean	**–1.02%**	**2.66%**	**2.52%**	**–12.49%**
Number of students	91,220	91,220	91,220	91,220
R-squared	.161	.201	.177	.107

6B: EAP Exemption Effect on Grade Point Average:

	Nondegree	CSU Transfer	UC Transfer	Math Basic Skills
OLS coefficient	**–.04**	**.04**	**.03**	**–.54***
Standard errors	(0.08)	(0.02)	(0.02)	(0.32)
Average values of outcomes	2.50	2.48	2.47	2.29
Standard deviation	1.12	0.97	1.00	1.22
Number of students	22,357	90,094	89,192	9,031
R-squared	.066	.091	.089	.082

6C: EAP Conditional Exemption Effect on Fraction of Classes That Are:

	Nondegree	CSU Transfer	UC Transfer	Math Basic Skills
OLS coefficient	–.0028*	.0228***	.0206***	–.0017**
Standard errors	(0.0015)	(0.0024)	(0.0027)	(0.0007)
Average values of outcomes	0.09	0.76	0.67	0.02
Percent change at the mean	**–3.18%**	**3.01%**	**3.09%**	**–7.73%**
Number of students	91,220	91,220	91,220	91,220
R-squared	.161	.201	.177	.107

6D:EAP Conditional Exemption Effect on Grade Point Average:

	Nondegree	CSU Transfer	UC Transfer	Math Basic Skills
OLS coefficient	**.02**	**.01**	**.01**	**.01**
Standard errors	(0.03)	(0.01)	(0.01)	(0.05)
Average values of outcomes	2.50	2.48	2.47	2.29
Standard deviation	1.12	0.97	1.00	1.22
Number of students	22,357	90,094	89,192	9,031
R-squared	.066	.091	.089	.082

NOTE: Control variables: California standardized test scores (CST), CST-squared, type of math CST taken, gender, race/ethnicity (African American/black, Latino, white, Asian, Other), first-generation college student, cohort fixed effects.
*$p < .05$. **$p < .01$. ***$p < .001$.

courses (–7.73 percent) compared with EAP nonexempt students and controlling for demographic characteristics and other measures of academic ability. Differences in grade performance between conditionally exempt and nonexempt students were not statistically significant.

The analyses have several important limitations. First, these results are not causal; I can only conclude that the EAP is associated with these outcomes at community colleges, not that EAP participation or exemption status causes the outcomes. The EAP remains a voluntary program, and as such a host of unobserved differences at the individual and school levels may be associated with EAP participation and the outcomes I measure. In more recent years, however, participation in the EAP has become nearly universal across the majority of California's high schools (with statewide participation rates at over 90 percent), suggesting that the voluntary nature of the program may not be such a critical issue.

Second, given the varied ways that California community colleges assess and assign students to courses, I am unable to determine the appropriateness of students' developmental course placements. I also only evaluate students in their first year at college. Some students may require developmental courses but are unable to enroll in them in the first year because they are not available. Some community colleges may have rules similar to the CSU that prevent students from taking any transfer-level courses until all developmental course needs are met, while others offer flexibility. Nevertheless, because I analyze years prior to the implementation of the EAP at community colleges, this lack of standardization in course placements across the community college system is unlikely to be systematically different for EAP test-takers than non-test-takers or for those who are EAP exempt and nonexempt.

Conclusion

The results of this analysis reveal that community college students have participated in the EAP in relatively large numbers, and that, controlling for a variety of factors, participation in EAP is associated with better first-year outcomes, specifically lower rates of developmental coursework, higher rates of transfer-level course enrollment, and higher grades. On average, students who obtain an EAP score that identifies them as college ready in English fare better in course placements and grades than similar students who do not obtain an English EAP exemption score. The analysis suggests that the EAP offers useful information about students' college readiness, above and beyond academic performance on California's high school standardized tests. Moreover, the information about college readiness offered by the EAP may be similar to what community colleges are obtaining through their own internal assessments. As such, community colleges stand to gain considerable utility (and perhaps efficiency) in implementing the EAP for purposes of remediation assessment and course placement.

The evidence in math is less clear. Because students must be eligible to participate in the math portion of the EAP, the sample of math test-takers is quite different from the sample of English test-takers. Students who take the math

EAP have enrolled in more rigorous courses during high school and are largely college bound. The analyses do not show a difference in course-taking patterns between math EAP eligible students who participate and those who do not, but they do show some positive effects of participation on grades. These findings suggest some selection effects, with more motivated students participating in the EAP. However, the investigation of the effects of exemption status on course-taking also show statistically significant differences in the types of first-year courses in which students enroll based on their math exemption status. Given that many community colleges currently do not take into account any high school academic performance measures (e.g., high school courses, grades, or test scores) in course assignment, utilizing the EAP (even eligibility for the math EAP test taking) may be very useful in course placement and assessing students' developmental needs.

This study has several important implications that merit further discussion and investigation. First, the findings indicate that well-aligned assessments of college readiness at the high school level offer significant predictive power at the postsecondary level, a result that the Partnership for Assessment of Readiness for College and Careers and Smarter Balanced Assessment Consortium are moving toward with the implementation of the Common Core State Standards (see for example: ACT 2010).

Second, the analyses demonstrate that the EAP is both relevant and potentially useful to California community colleges in identifying students' academic needs when entering college either in lieu of college-specific exams, or at least as an additional indicator for course placement. Placement tests are often high stakes for students and as such should be implemented with great care. Recent research has highlighted the weak predictive power of college placement tests for purposes of remedial placement and suggests that the cutoff for compulsory remediation may be too high and should be adjusted to reduce overplacement into developmental coursework (Hughes and Scott-Clayton 2011; Scott-Clayton 2012). Moreover, researchers and policy-makers have devoted considerable attention to the use of multiple measures in developmental course placement at community colleges to remove potential obstacles in students' pathways to a college degree or certificate (Jackson and Kurlaender 2013; Scott-Clayton, Crosta, and Belfield 2012; Saxon, Levine-Brown, and Boylan 2008).[13]

A third potentially important policy implication is that providing alternative routes from K–12 to demonstrate college readiness proficiency may lead to greater efficiencies for both students and institutions in facilitating degree progress. Of course, reaching consensus over what constitutes college readiness is not without challenge, as evidenced by the fact that quite a few California community colleges have not (yet) adopted the EAP and continue to favor their own homegrown or alternative assessments. A related implication is the great difficulty in assessing the impacts of programs such as EAP on student- and institutional-level outcomes, given data limitations and a lack of cooperation between K–12 and postsecondary systems of education.

Last, very few students who enter California community colleges are identified as college ready based on these eleventh grade assessments. California's

experience with the EAP offers a unique perspective of what might lie ahead for the nation's broad-access institutions with the implementation of Common Core State Standards. More specifically, the findings suggest that informing students of their college readiness while they are still in high school may improve their transition to college. However, California's experience with the EAP also suggests that simply raising the academic standards of what it means to be college ready while in high school (without other significant reforms) is unlikely to result in a greater number of students entering community colleges ready for college-level work. In short, the findings here suggest that community colleges and other broad-access institutions will need to continue to partner with K–12 education in addressing the sizable gaps in college readiness. The promise of Common Core State Standards for improving college readiness may only be fully realized by improving students' postsecondary success.

Notes

1. Researchers are currently evaluating the impact of the Michigan Merit Curriculum as part of the Michigan Consortium for Educational Research; see http://michiganconsortium.org/.

2. Some scholars and educators prefer to use the term "developmental" education, rather than "remedial." The former avoids creating a deficit framework of what students do not know, instead favoring a developmental approach that suggests a continuum of learning. I use the terms *remedial* and *developmental* education interchangeably here.

3. Much of the description of the Early Assessment Program here comes from Howell, Kurlaender, and Grodsky (2009).

4. For additional information, see CSU-developed online resources to help students and their families make sense of their EAP results and what to do to prepare for CSU: http://www.csusuccess.org.

5. This program is currently being evaluated; the California State University was awarded an i3 innovation grant from the Institute for Educational Sciences to evaluate the Expository Reading and Writing Curriculum (ERWC), which is a key component of the EAP program. The evaluation should offer important lessons for the professional development efforts upon which the success of the Common Core State Standards hinges.

6. See www.cccco.edu/Portals/4/SS/EAP/TrngEAP/EAP101/ch1/sb_946_bill_20080928_chaptered%5B1%5D.pdf.

7. See http://www.cccco.edu.

8. I also do additional analysis to capture any potential unobserved differences in these outcomes by community college campuses; results do not differ substantially with fixed effects at the campus level. Results may be obtained from the author upon request.

9. The California Community College Chancellor's Office categorizes all developmental coursework as either "Basic" (defined using the indicator CB08 "Course Basic Skills Status"), or "Remedial" (defined using the indicator CB21 "Course Prior to College Level"). These courses are below transfer-level courses.

10. All GPA variables are calculated using first-year classes where both units are attempted and a letter grade is given.Units attempted are defined by the variable "SX_UNITS_ATTEMPTED" and grade points are assigned using the standard A=4, B=3, C=2, D=1, F=0 and assigned using "SX_GRADE"; "Pass," "No Pass," "Ungraded," "Withdrew," and so on are all excluded from the calculation of both grade points *and* units attempted. Grades marked only as "Incomplete" are excluded, while grades marked as "Incomplete" with a default grade to be received if not completed are given the default grade. All GPA calculations are weighted by the number of units attempted. Therefore total GPA is calculated as the unit-weighted grade point total value divided by the number of units. Subgroup GPAs (e.g., UC transferable, CSU transferable, Basic Skills) are calculated only within that particular subgroup. Both the total grade points and the units attempted must fall within the subgroup to be included in the calculation. For example, the calculation of

UC-transferable GPA will only take into account the grades that were received and the units attempted in UC-transferable classes. The calculations are done by calculating the grade points and multiplying by the units attempted *for each class*, then, for each student, summing up the grade points and the units (within subgroup only, if necessary) and diving the grade points by the units. In other words, GPA follows the calculation below, where "*i*" is a student and "*c*" represents all the courses in the subgroup of interest.

$$GPA_i = \frac{\sum_c Grade\ Points_{ic} * Units\ Attempted_{ic}}{\sum_c Units\ Attempted_{ic}}$$

11. Statewide, exemption rates on the English EAP have gone up slightly, from 20 percent in 2009 to 21 percent in 2010 to 23 percent in 2011. In math, EAP exemption rates have stayed fairly stable at 15 percent, and 43 percent conditional exempt. See http://eap2011.ets.org/.

12. Full OLS models are available upon request from the author.

13. See for example, the Long Beach College Promise; http://lbcc.edu/promisepathways/.

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