College Prep for All, Part II

Technical Appendices

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Appendix A Description of the Data and Construction of Student Cohorts

The data used in this report consist of annual student-level records of courses completed and grades received, along with data on various student characteristics such as demographics, English Learner (EL) status and participation in special education.

This study is a *cohort* analysis, meaning we organize students into groups based on timing. Specifically we group students based on the first school year in which they enter grade 9. Following district policy, we assign each student to a graduating "class of" based on the year in which they are expected to graduate. For instance, a student first observed in grade 9 during the 2011-12 school year is expected to graduate in June 2015, and is included in the class of 2015. In line with district policy, if a student repeats a grade in high school, his or her "class of" does not change.

After assigning students in this way, we follow students' progress and compare outcomes across cohorts. These outcomes are typically measured up through a particular grade level to allow for a fair and relevant comparison.

When comparing students' a-g course and subject completions by grade, we use the first time they enroll in grade 9 as their grade 9 year, and the following 3 school years we label as grades 10, 11 and 12 respectively. These are really "expected grades." This may sometimes differ from how schools or SDUSD perceives students' grade levels. For instance, in some of SDUSD's internal record-keeping, the convention is that students must complete a given number of credits to be labeled as having advanced to the next grade in high school.

For our analysis, however, it was crucial to compare students in different cohorts based on their *expected* grade level. Our rationale follows. Suppose that, before the new graduation requirement, students always advance from 9th to 10th grade within one year. Now suppose that the new graduation requirement greatly reduces the number of credits passed in grade 9, so that in the classes of 2016 and later, students all require two attempts at grade 9 (in the district databases) before advancing to grade 10. If we compared the number of a-g classes completed by the end of grade 9, we would really be comparing students in the classes of 2016 and later in their **second year** of high school to students in earlier classes in their **first year** of high school. This "apples and oranges" comparison would lead us to overestimate the impact of the graduation requirement on the gain in a-g courses completed.

What parents and district policymakers should really care about is whether the new college prep requirement has influenced the likelihood that a student will graduate four years after first entering grade 9. By using students' expected high school grade level when comparing course completion rates, we ask exactly that question.

When focusing on cohorts in this way, we do exclude certain students. SDUSD does not receive transcript data from most district charter schools and, further, charter schools have not implemented the same a-g graduation policy as district-managed schools. Therefore, students who were enrolled in charter schools in grade 9 are excluded. Similarly, a very small number of grade 9 students face severe learning disabilities and are not on a high school graduation pathway. For this reason we exclude students who were enrolled in the Transition Resources for Adult Community Education program (TRACE) in grade 9. We also exclude a small number of students who lack transcript data for any year in which they were enrolled in the district from grade 7 forward, as we rely on transcript data for course counts.

Further, our focus in this cohort study is to compare the academic progress of students throughout their

high school careers. We want to study whether a student facing the new graduation requirement makes faster or slower progress as he/she progresses through high school. For this reason, we exclude students who arrive in the district during 10th grade or later. Just as it would be unfair to credit the district for the success of a student arriving in the district in grade 11 with his or her a-g courses fully completed, it would be unfair to blame the district for a student who arrives in the district in grade 10 or 11 who had yet to take his or her first a-g course.

We also address various ways in which students may exit our data. One way is by dropping out of school. For students that SDUSD indicates as dropouts, we keep these students in our data up through their expected 12th grade year. For the years after they drop out, we maintain their a-g course counts at the last observed level.

For students who leave the district or who stay in the district but switch to charter schools, we typically must drop these students from all subsequent-grade outcomes, since we will no longer receive transcript data (except for a small number of cases where students later return). Our exclusion of these students could skew findings if the a-g policy itself caused some of them to leave. Now, when comparing students who *remain* up through a given grade, the type of student who remains may be different across cohorts, making again for an "apples to oranges" comparison. For this reason, we explicitly model the likelihood that students leave the district altogether or switch to charter schools. As described in the main text and below, we found no evidence that students in the classes of 2016 and later were more likely to switch to charter schools, and a very small but sometimes statistically significant increase in the probability of leaving the district. So while we do lose these students from our data, we believe this has only a small effect on our results, since the rate of exit is relatively similar across cohorts.

Occasionally, these choices of data may affect external comparability. For example in the main text we report the official 2013-14 SDUSD graduation rate, which includes not only students who begin 9th grade in the district but those who arrive later. We compare that to our predicted a-g completion rate for the class of 2016, from which we exclude latecomers to the district. As another example, because we exclude students who start high school in charter schools, our total sample size will be smaller than official district enrollment. But our approach has the important virtue of answering the question: for those students who start grade 9 in non-charter and non-TRACE programs, how has a-g course-taking changed for the classes affected by the new college prep requirement?

Appendix B
Detailed Results

This appendix presents results that underpin statements made in the main text. We use the same section headings as in the main text to help readers pinpoint related results. The first section, "Students Are Taking More College Prep Courses" describes the overall procedure in greatest detail, and may prove helpful even to readers interested in other outcomes.

When not stated otherwise, all counts of a-g semester courses or subject areas completed are with grades of D or better.

Students Are Taking More College Prep Courses

For each of grades 9, 10, and 11, we calculated the number of a-g courses completed with grades of D or higher up through that (expected) grade level for students in the class of 2010 onward. We then estimated regressions that model the number of courses completed by each student as a function of a linear time trend and indicators for the classes of 2016 and later. Depending on the grade level of the outcome, we include up through the latest cohort expected to have completed that grade by June 2015.

Thus, outcomes through grade 9 include the classes of 2010 to 2018; outcomes through grade 10 include the classes of 2010 to 2017; and outcomes through grade 11 include the classes of 2010 to 2016.

In our regressions, the coefficient on graduation year reports a linear trend based on the classes of 2010-2015. Later cohorts do not affect the slope of this trend (since they all have separate indicators), but the trend itself is extended through to the later cohorts to predict outcomes supposing no change in policy had occurred. The coefficients on dummies for classes of 2016 and later report the estimated break from trend for each of these cohorts. These are the key coefficients of interest. When significantly different from zero, it indicates that a-g course completion for these cohorts can be statistically distinguished from a continuation of past trends.

Our procedure when looking at the number of subject areas completed is the same, except for the outcome. All models also cluster standard errors by the current school attended (or the most recent school attended for those who have dropped out).

An additional explanatory variable in some specifications is the predicted likelihood that a student eventually completes the a-g requirements (with grades of D or higher) based on 6th grade characteristics. This likelihood is unavailable for some students (e.g. those entering the district later than 6th grade), so we also include a separate indicator for when this variable is missing, while setting original predicted likelihood at zero in such cases.

Controlling for predicted likelihood helps prevent changing *academic potential* across cohorts from driving any estimated breaks from trend, which might otherwise be interpreted as policy effects. We prefer these models because any improvement in academic performance observed by grade 6 is unlikely to be caused by the new graduation policy, but may help explain outcomes of interest. (Very few students take a-g courses as early as grade 6. Students most commonly begin in grades 7 or 8, often with world language courses.)

Tables B1 through B3 show the linear regression models of the number of a-g courses and subject areas completed as of grades 9, 10 and 11. Tables B4-B6 and B7-B9 are the same, except that they model courses completed with grades of 'C or better' and 'F or better' (for coursework attempted) respectively. For the grade 9 and 10 models, where more than one cohort is subject to the new graduation requirement, the bottom of the table reports the p-value from a test that the coefficients on dummy variables for affected cohorts jointly equal zero.

In the main text, statements about the size and significance of any breaks from trend come from the models in columns (2) and (4) that include controls for predicted likelihood of completing the a-g sequence. Table B10 shows the results of the probit model used to estimate this likelihood using grade 6 characteristics.

TABLE B1

Main Outcomes Through Grade 9 (D or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.581**	0.534**	0.006	-0.004
	(0.195)	(0.139)	(0.044)	(0.040)
Class of 2017	0.700**	0.560**	0.024	0.001
	(0.256)	(0.185)	(0.061)	(0.056)
Class of 2018	0.603	0.378	0.015	-0.019
	(0.325)	(0.239)	(0.074)	(0.066)
Graduation Year (Minus 2016)	0.226**	0.028	0.075**	0.050**
	(0.058)	(0.050)	(0.014)	(0.013)
Predicted Probability of Completing A-G		11.236**		1.366**
		(0.334)		(0.163)
Predicted Probability Unavailable		3.934**		0.411**
		(0.310)		(0.067)
Constant	9.776**	3.726**	1.291**	0.577**
	(0.452)	(0.338)	(0.082)	(0.105)
Observations	73,588	73,588	73,588	73,588
R-squared	0.031	0.400	0.040	0.173
P-value on F Test of Joint Significance	0.002	0.000	0.943	0.948

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B2

Main Outcomes Through Grade 10 (D or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.709**	0.725**	0.222**	0.234**
	(0.266)	(0.222)	(0.067)	(0.054)
Class of 2017	0.796*	0.718*	0.234*	0.227**
	(0.393)	(0.308)	(0.103)	(0.081)
Graduation Year (Minus 2016)	0.318**	0.009	0.077**	0.008
	(0.080)	(0.068)	(0.023)	(0.019)
Predicted Probability of Completing A-G		16.875**		3.983**
		(0.520)		(0.108)
Predicted Probability Unavailable		6.469**		1.687**
		(0.454)		(0.127)
Constant	18.489**	8.970**	2.836**	0.540**
	(0.684)	(0.623)	(0.161)	(0.113)
Observations	60,418	60,418	60,418	60,418
R-squared	0.019	0.354	0.023	0.349
P-value on F Test of Joint Significance	0.034	0.007	0.005	0.000

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B3

Main Outcomes Through Grade 11 (D or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.922*	1.042**	0.174*	0.204**
	(0.357)	(0.322)	(0.070)	(0.059)
Graduation Year (Minus 2016)	0.519**	0.100	0.103**	0.027
	(0.133)	(0.106)	(0.025)	(0.020)
Predicted Probability of Completing A-G		21.250**		4.071**
		(0.799)		(0.179)
Predicted Probability Unavailable		8.476**		1.796**
		(0.633)		(0.132)
Constant	28.657**	16.194**	4.639**	2.202**
	(0.900)	(0.892)	(0.153)	(0.168)
Observations	49,067	49,067	49,067	49,067
R-squared	0.017	0.308	0.017	0.269
P-value on F Test of Joint Significance	0.012	0.002	0.016	0.001

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B4

Main Outcomes Through Grade 9 (C or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.577**	0.552**	0.013	0.006
	(0.186)	(0.129)	(0.042)	(0.038)
Class of 2017	0.619*	0.501**	0.028	0.008
	(0.254)	(0.177)	(0.060)	(0.055)
Class of 2018	0.563	0.353	0.023	-0.010
	(0.323)	(0.230)	(0.074)	(0.065)
Graduation Year (Minus 2016)	0.248**	0.026	0.073**	0.045**
	(0.057)	(0.048)	(0.013)	(0.012)
Predicted Probability of Completing A-G		13.069**		1.578**
		(0.368)		(0.157)
Predicted Probability Unavailable		5.049**		0.543**
		(0.394)		(0.067)
Constant	8.781**	1.587**	1.164**	0.318**
	(0.492)	(0.348)	(0.085)	(0.099)
Observations	73,588	73,588	73,588	73,588
R-squared	0.029	0.436	0.039	0.203
P-value on F Test of Joint Significance	0.002	0.000	0.960	0.958

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B5

Main Outcomes Through Grade 10 (C or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.622*	0.678**	0.165*	0.180**
	(0.269)	(0.223)	(0.064)	(0.050)
Class of 2017	0.604	0.563	0.172	0.169*
	(0.401)	(0.303)	(0.098)	(0.076)
Graduation Year (Minus 2016)	0.390**	0.030	0.091**	0.018
	(0.076)	(0.064)	(0.020)	(0.016)
Predicted Probability of Completing A-G		20.411**		4.245**
		(0.458)		(0.127)
Predicted Probability Unavailable		8.516**		1.845**
		(0.606)		(0.156)
Constant	16.731**	5.005**	2.586**	0.125
	(0.768)	(0.626)	(0.163)	(0.119)
Observations	60,418	60,418	60,418	60,418
R-squared	0.019	0.400	0.023	0.360
P-value on F Test of Joint Significance	0.067	0.012	0.038	0.002

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B6

Main Outcomes Through Grade 11 (C or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.797*	0.983**	0.163*	0.202**
	(0.373)	(0.333)	(0.080)	(0.064)
Graduation Year (Minus 2016)	0.623**	0.119	0.116**	0.025
	(0.125)	(0.100)	(0.024)	(0.019)
Predicted Probability of Completing A-G		26.532**		4.905**
		(0.654)		(0.158)
Predicted Probability Unavailable		11.503**		2.244**
		(0.804)		(0.160)
Constant	26.196**	10.372**	4.224**	1.265**
	(1.033)	(0.904)	(0.176)	(0.167)
Observations	49,064	49,064	49,064	49,064
R-squared	0.018	0.364	0.017	0.315
P-value on F Test of Joint Significance	0.036	0.004	0.045	0.002

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B7

Main Outcomes Through Grade 9 (F or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.661**	0.577**	-0.042	-0.058
	(0.208)	(0.167)	(0.056)	(0.055)
Class of 2017	0.819**	0.653**	-0.008	-0.036
	(0.257)	(0.210)	(0.071)	(0.070)
Class of 2018	0.747*	0.514	-0.050	-0.087
	(0.336)	(0.275)	(0.079)	(0.074)
Graduation Year (Minus 2016)	0.194**	0.058	0.082**	0.065**
	(0.056)	(0.051)	(0.015)	(0.014)
Predicted Probability of Completing A-G		6.734**		0.762**
		(0.322)		(0.171)
Predicted Probability Unavailable		1.466**		0.065
		(0.281)		(0.076)
Constant	11.082**	7.752**	1.504**	1.161**
	(0.350)	(0.309)	(0.076)	(0.116)
Observations	73,599	73,599	73,599	73,599
R-squared	0.044	0.300	0.043	0.110
P-value on F Test of Joint Significance	0.000	0.000	0.321	0.169

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B8

Main Outcomes Through Grade 10 (F or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	0.851**	0.782**	0.312**	0.315**
	(0.278)	(0.255)	(0.073)	(0.062)
Class of 2017	1.157**	1.004**	0.359**	0.345**
	(0.353)	(0.313)	(0.104)	(0.087)
Graduation Year (Minus 2016)	0.193*	0.013	0.050*	-0.006
	(0.077)	(0.070)	(0.023)	(0.020)
Predicted Probability of Completing A-G		8.248**		3.047**
		(0.370)		(0.099)
Predicted Probability Unavailable		1.683**		1.166**
		(0.346)		(0.115)
Constant	20.821**	16.620**	3.115**	1.397**
	(0.518)	(0.528)	(0.149)	(0.129)
Observations	60,417	60,417	60,417	60,417
R-squared	0.022	0.221	0.026	0.291
P-value on F Test of Joint Significance	0.006	0.007	0.000	0.000

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B9

Main Outcomes Through Grade 11 (F or Better)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Class of 2016	1.237**	1.214**	0.198**	0.207**
	(0.360)	(0.340)	(0.060)	(0.054)
Graduation Year (Minus 2016)	0.305**	0.068	0.070**	0.021
	(0.110)	(0.097)	(0.022)	(0.019)
Predicted Probability of Completing A-G		10.079**		2.368**
		(0.588)		(0.171)
Predicted Probability Unavailable		2.175**		0.865**
		(0.527)		(0.120)
Constant	31.440**	26.059**	5.098**	3.732**
	(0.685)	(0.767)	(0.104)	(0.149)
Observations	49,081	49,081	49,081	49,081
R-squared	0.016	0.173	0.016	0.168
P-value on F Test of Joint Significance	0.001	0.001	0.001	0.000

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B10

Probit Coefficients for Eventually Completing A-G Requirements with D or Better Based on 6th Grade Characteristics (Classes of 2011-2013)

Female	0.077*
	(0.035)
English Learner	-0.287**
	(0.053)
Fluent English Proficient	-0.149**
	(0.045)
Special Education	-0.273**
	(0.060)
Percentage of Time Absent	-0.026**
	(0.005)
GPA in 6th Grade	0.579**
	(0.040)
CST Performance Score, Math	0.185**
	(0.023)
CST Performance Score, Reading	0.127**
	(0.028)
CST Performance Score Unavailable, Math	-1.421**
	(0.368)
CST Performance Score Unavailable, Reading	0.064
	(0.602)
CST Performance Score, Science (5th Grade)	0.016
	(0.024)
CST Performance Score Unavailable, Science	-0.280*
	(0.113)
Not in District for Grade 5	0.163
	(0.112)
Constant	-2.358**
	(0.131)
Observations	12,687
Pseudo R-squared	0.254

Robust standard errors, clustered by school, are in parentheses.
** p<0.01, * p<0.05

As seen in Tables B1-B6, students in the class of 2016 and later appear to be completing more a-g coursework than students of past cohorts, on average. In Tables B7-B9, it can be seen that students are also *attempting* more a-g courses than before, with the increase in attempted a-g coursework being slightly larger than the increase in actual completion. However, since many earlier students did not actually complete the a-g sequence, improvement alone does not ensure that students in the later cohorts are now on track to meet the new requirements. Here, it may be helpful to compare against successful past completers of the a-g sequence.

Table B11 shows the historical trajectory of all students and successful a-g completers from the classes of 2011-2013. For comparison, Table B12 shows the trajectory of courses completed by all students in the classes of 2016 and later. Bold cells indicate grades by which the average student had completed the required coursework

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TABLE B11

The average number of a-g semester courses completed by subject area and grade among all students and successful completers in the classes of 2011-2013

All Students

End of Grade:	Social Sciences	English	Math	Science	Languages	VPA	Part g	Total
9	0.4	1.7	3.3	0.9	2.0	0.8	0.8	10.0
10	1.9	3.6	5.0	2.7	3.2	1.4	1.0	18.7
11	3.7	5.4	**6.4**	**4.4**	**4.1**	**2.3**	1.5	27.9
12	**4.6**	**7.3**	7.5	5.4	4.4	3.8	**3.0**	36.1

Successful Completers

End of Grade:	Social Sciences	English	Math	Science	Languages	VPA	Part g	Total
9	0.5	2.0	3.9	1.3	2.7	0.9	0.7	12.0
10	2.2	4.1	5.9	3.3	**4.3**	1.5	0.9	22.1
11	**4.3**	6.1	**7.7**	**5.4**	5.3	**2.6**	1.4	32.8
12	5.2	**8.2**	9.1	6.5	5.8	4.2	**3.2**	42.1

SOURCES: Authors' calculations.

NOTES: Each cell shows the average number of semester courses completed with grades of D or higher by the end of the specified period. Cells in bold indicate that on average students had completed the graduation requirements in the given subject area by the end of the given grade. Table imposes the same sample restrictions as used for the classes of 2016 and later.

TABLE B12

The number of a-g semester courses completed by subject area and grade for the classes of 2016 to 2018

Class of 2016

End of Grade:	Social Sciences	English	Math	Science	Languages	VPA	Part g	Total
9	0.4	1.7	3.3	1.1	2.3	1.1	0.6	10.5
10	2.0	3.5	5.0	2.8	3.6	1.7	0.7	19.3
11	3.8	5.4	**6.7**	**4.8**	**4.6**	**2.8**	1.5	29.6
11 + Summer School 2015	3.9	5.5	6.8	4.9	4.6	2.8	1.5	29.9

Class of 2017

End of Grade:	Social Sciences	English	Math	Science	Languages	VPA	Part g	Total
9	0.4	1.7	3.3	1.1	2.6	1.2	0.6	10.8
10	1.9	3.5	5.0	2.9	3.9	1.8	0.8	19.6
10 + Summer School 2015	2.0	3.5	5.1	2.9	3.9	1.8	0.8	19.9

Class of 2018

End of Grade:	Social Sciences	English	Math	Science	Languages	VPA	Part g	Total
9	0.4	1.6	3.2	1.3	2.6	1.2	0.5	10.8
9 + Summer School 2015	0.4	1.7	3.3	1.3	2.6	1.2	0.5	11.1

SOURCES: Authors' calculations.

NOTES: Each cell shows the average number of semester courses completed with grades of D or higher by the end of the specified period. Cells in bold indicate that on average students had completed the graduation requirements in the given subject area by the end of the given grade.

Comparing these numbers across the two tables, one sees that students in the classes of 2016 to 2018 are behind the average pace of past successful completers. This gap also appears to widen in later grade levels, as students progress through high school. So despite overall improvement, this comparison suggests many students in the class of 2016 still will not meet the a-g requirements.

One caveat to note is that successful past completers took far more than the minimum 30 semester courses needed to complete the a-g sequence, completing instead about 42 courses on average. This comparison may thus overstate the degree to which students in the affected cohorts are truly behind the needed pace for completion.

But this comparison yields another valuable insight: that the minimum 30 semester courses understates the total amount of coursework that students (at least in the past) typically accumulate on their way to completing the a-g requirements. Historically, few students have completed the overall a-g sequence with just 30 semester courses (or slightly more) of a-g credit. Only about 10 percent of completers from the classes of 2011-2013 finished with 36 or fewer course credits.

Further, students also sometimes accumulate 30+ semesters of credit but nevertheless fail to complete the a-g sequence, depending on how these credits are distributed by subject. For this reason, readers should not confuse the fact that the average student in the class of 2016 has completed nearly 30 semester courses as meaning those students have met the overall requirement. The section titled "How Far Off Track Are Students in the Class of 2016?" provides additional detail.

Table B12 also provides important information about the role that summer school has recently played. The final row in each panel shows that, in summer 2015, students in the classes of 2016 to 2018 earned an extra 0.3 credits on average. The additional credits are largely concentrated in English, math, and science.

Which Students Are Responding Most Strongly?

To test whether students have responded differentially based on their prior likelihood of completing the a-g requirement, we first estimated this baseline likelihood using characteristics observed in 6th grade (see Table B10). We next estimated models in which the pre-existing time trend and subsequent deviation from this trend are allowed to vary by baseline likelihood of a-g completion.

Tables B13 through B15 below show the results. In these tables, 'post' is a dummy for being in a cohort subject to the new requirement (2016 or later). The key coefficient in these tables is on the interaction term between 'post' and predicted probability of a-g completion, indicating whether there has been a heterogeneous break from trend.

The results show that, not initially but over time, students appear to increase their a-g coursework by more when they had a lower baseline likelihood of completing a-g. In grade 9, the estimated break from trend does not vary substantially by baseline probability of completion. By grade 10, the key interaction coefficient takes on a much larger negative value, but remains statistically insignificant. By grade 11, the key interaction coefficient is significantly negative for course semesters completed.

TABLE B13

Heterogeneity by Baseline Probability of Completing A-G (Outcomes Through Grade 9)

VARIABLES	(1) Course Semesters	(2) Subject Areas
Predicted Probability * Post	-0.042	0.092
	(0.318)	(0.123)
Predicted Probability * Graduation Year	-0.059	0.020
	(0.083)	(0.031)
Predicted Probability of Completing A-G	11.153**	1.384**
	(0.387)	(0.173)
Post	0.445	-0.068
	(0.233)	(0.059)
Graduation Year (Minus 2016)	0.051	0.036*
	(0.061)	(0.014)
Constant	3.783**	0.562**
	(0.352)	(0.092)
Observations	47,765	47,765
R-squared	0.534	0.177
P-value on F Test of Equal Deviations from Trend	0.896	0.456
P-value on F Test of Equal Time Trends	0.482	0.514

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B14

Heterogeneity by Baseline Probability of Completing A-G (Outcomes Through Grade 10)

VARIABLES	(1) Course Semesters	(2) Subject Areas
Predicted Probability * Post	-0.574	-0.085
	(0.575)	(0.145)
Predicted Probability * Graduation Year	-0.168	-0.025
	(0.106)	(0.028)
Predicted Probability of Completing A-G	16.633**	3.952**
	(0.602)	(0.165)
Post	1.148*	0.314**
	(0.519)	(0.114)
Graduation Year (Minus 2016)	0.050	0.007
	(0.093)	(0.021)
Constant	8.968**	0.517**
	(0.676)	(0.116)
Observations	39,586	39,586
R-squared	0.515	0.490
P-value on F Test of Equal Deviations from Trend	0.322	0.559
P-value on F Test of Equal Time Trends	0.118	0.382

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

TABLE B15

Heterogeneity by Baseline Probability of Completing A-G (Outcomes Through Grade 11)

VARIABLES	(1) Course Semesters	(2) Subject Areas
Predicted Probability * Post	-1.564*	-0.251
	(0.699)	(0.186)
Predicted Probability * Graduation Year	-0.347	-0.148**
	(0.183)	(0.036)
Predicted Probability of Completing A-G	20.470**	3.666**
	(1.056)	(0.231)
Post	2.159**	0.402*
	(0.619)	(0.158)
Graduation Year (Minus 2016)	0.221	0.094*
	(0.178)	(0.036)
Constant	16.415**	2.388**
	(1.066)	(0.209)
Observations	32,096	32,096
R-squared	0.473	0.423
P-value on F Test of Equal Deviations from Trend	0.029	0.182
P-value on F Test of Equal Time Trends	0.063	0.000

Robust standard errors, clustered by school, are in parentheses. ** p<0.01, * p<0.05

We also estimated models that allow for different linear trends and break from trend for subgroups defined by race/ethnicity, English Learner status, and participation in special education. In all cases we used the classification as recorded in 9th grade. These analyses did not show clear patterns of differences in break from trend for the cohorts facing the new graduation requirement. Tables B16-B18 show results through 10th grade using these subgroups. Results through grades 9 and 11 are omitted for brevity, since they are mostly similar, but these results are available by request.

TABLE B16

Heterogeneity by Ethnicity (Outcomes Through Grade 10)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Post * White	0.680**	0.566**	0.218**	0.200**
	(0.218)	(0.144)	(0.078)	(0.064)
Post * African-American	1.063*	0.693	0.278**	0.207*
	(0.464)	(0.394)	(0.097)	(0.088)
Post * Asian/Pacific Islander	1.078**	1.072**	0.310**	0.318**
	(0.341)	(0.281)	(0.096)	(0.084)
Post * Hispanic	0.611	0.699	0.188	0.218*
	(0.478)	(0.411)	(0.101)	(0.083)
Graduation Year * White	0.202*	-0.125	0.047	-0.026
	(0.079)	(0.068)	(0.024)	(0.017)
Graduation Year * African-American	0.336**	0.119	0.082**	0.037
	(0.112)	(0.100)	(0.024)	(0.023)
Graduation Year * Asian/Pacific Islander	0.163*	-0.167*	0.047	-0.025
	(0.071)	(0.071)	(0.032)	(0.019)
Graduation Year * Hispanic	0.381**	0.160	0.091**	0.041
	(0.104)	(0.093)	(0.023)	(0.021)
African-American	-4.490**	-1.255**	-1.173**	-0.440**
	(0.639)	(0.441)	(0.156)	(0.112)
Asian/Pacific Islander	-0.913	-0.400	-0.211	-0.090
	(0.531)	(0.340)	(0.139)	(0.122)
Hispanic	-4.832**	-1.572**	-1.172**	-0.426**
	(0.651)	(0.532)	(0.148)	(0.112)
Predicted Probability of Completing A-G		15.082**		3.508**
		(0.461)		(0.102)
Predicted Probability Unavailable		5.510**		1.443**
		(0.378)		(0.112)
Constant	21.265**	10.948**	3.518**	1.077**
	(0.449)	(0.378)	(0.152)	(0.113)
Observations	59,955	59,955	59,955	59,955
R-squared	0.139	0.375	0.157	0.376
P-value on F Test of Equal Deviations from Trend	0.642	0.439	0.668	0.195
P-value on F Test of Equal Time Trends	0.113	0.007	0.141	0.000

Robust standard errors, clustered by school, are in parentheses.

** p<0.01, * p<0.05

TABLE B17

Heterogeneity by English Learner Status (Outcomes Through Grade 10)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Post * Non-EL	0.618*	0.628**	0.212**	0.220**
	(0.247)	(0.216)	(0.076)	(0.065)
Post * EL	0.538	0.992*	0.108	0.250**
	(0.453)	(0.411)	(0.069)	(0.062)
Graduation Year * Non-EL	0.261**	0.000	0.067**	0.006
	(0.073)	(0.068)	(0.022)	(0.018)
Graduation Year * EL	0.127	0.044	0.037*	0.014
	(0.083)	(0.084)	(0.017)	(0.019)
EL Status in Grade 9	-8.273**	-4.168**	-1.636**	-0.661**
	(0.414)	(0.388)	(0.111)	(0.081)
Predicted Probability of Completing A-G		14.378**		3.581**
		(0.461)		(0.106)
Predicted Probability Unavailable		5.436**		1.521**
		(0.405)		(0.118)
Constant	19.643**	10.968**	3.064**	0.860**
	(0.560)	(0.590)	(0.142)	(0.115)
Observations	60,418	60,418	60,418	60,418
R-squared	0.187	0.395	0.145	0.369
P-value on F Test of Equal Deviations from Trend	0.841	0.312	0.157	0.663
P-value on F Test of Equal Time Trends	0.135	0.639	0.113	0.631

Robust standard errors, clustered by school, are in parentheses.

** p<0.01, * p<0.05

TABLE B18

Heterogeneity by Special Education Status (Outcomes Through Grade 10)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Post * Not in Special Ed	0.778**	0.748**	0.243**	0.244**
	(0.289)	(0.232)	(0.077)	(0.062)
Post * Special Ed	0.831	0.689	0.175*	0.166*
	(0.433)	(0.394)	(0.074)	(0.066)
Graduation Year * Not in Special Ed	0.334**	0.030	0.082**	0.011
	(0.080)	(0.068)	(0.022)	(0.018)
Graduation Year * Special Ed	0.109	0.051	0.027	0.012
	(0.109)	(0.110)	(0.021)	(0.024)
Special Ed Status in Grade 9	-8.262**	-4.157**	-1.633**	-0.668**
	(0.342)	(0.322)	(0.098)	(0.070)
Predicted Probability of Completing A-G		15.127**		3.697**
		(0.617)		(0.115)
Predicted Probability Unavailable		5.698**		1.562**
		(0.459)		(0.119)
Constant	19.427**	10.453**	3.021**	0.781**
	(0.644)	(0.709)	(0.157)	(0.128)
Observations	60,418	60,418	60,418	60,418
R-squared	0.140	0.387	0.110	0.365
P-value on F Test of Equal Deviations from Trend	0.885	0.854	0.273	0.181
P-value on F Test of Equal Time Trends	0.016	0.809	0.004	0.971

Robust standard errors, clustered by school, are in parentheses.

** p<0.01, * p<0.05

The main text also mentions variations by parental education. Tables B19 through B21 show results of these models for grades 9, 10 and 11 respectively.

Looking first at semester courses completed, the hypothesis of an equal break from trend for all parental education groups is strongly rejected regardless of grade level. Students whose parents have less than a college education (either "some college," "high school diploma," or "less than a high school diploma") typically appear to have responded most. Students whose parents have college degrees (but no graduate school) nearly always appear to have responded least, showing no significant break from trend in any of these models.

These tables also show the break from trend in the number of *subject areas* completed. No break from trend emerges in grade 9, but in grades 10 and 11 breaks from trend differ by parental education in a pattern similar to what we found for courses completed: students whose parents had not graduated from college showed the biggest break from trend. But the differences were significant in grade 10 only, once controlling for baseline likelihood of completing a-g.

TABLE B19

Heterogeneity by Parental Education (Outcomes Through Grade 9)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Post * LT High School	0.727**	0.907**	0.010	0.026
	(0.258)	(0.216)	(0.071)	(0.071)
Post * High School Graduate	0.530*	0.568*	-0.036	-0.035
	(0.255)	(0.230)	(0.059)	(0.059)
Post * Some College	0.719**	0.594**	-0.009	-0.029
	(0.195)	(0.167)	(0.051)	(0.051)
Post * College Graduate	0.126	0.193	-0.053	-0.048
	(0.205)	(0.176)	(0.070)	(0.061)
Post * Graduate School	0.805**	0.529**	0.082	0.042
	(0.197)	(0.127)	(0.062)	(0.045)
Graduation Year * LT High School	0.106	-0.001	0.062**	0.049**
	(0.066)	(0.057)	(0.013)	(0.012)
Graduation Year * High School Graduate	0.136*	0.022	0.072**	0.057**
	(0.058)	(0.051)	(0.012)	(0.012)
Graduation Year * Some College	0.030	-0.054	0.059**	0.047**
	(0.043)	(0.046)	(0.013)	(0.014)
Graduation Year * College Graduate	0.226**	-0.001	0.089**	0.059**
	(0.051)	(0.058)	(0.017)	(0.016)
Graduation Year * Graduate School	0.079	-0.103*	0.059**	0.034
	(0.053)	(0.050)	(0.022)	(0.019)
High School Graduate	1.037**	0.646**	0.120**	0.070*
	(0.223)	(0.210)	(0.036)	(0.035)
Some College	2.224**	1.227**	0.233**	0.106
	(0.300)	(0.320)	(0.048)	(0.054)
College Graduate	4.149**	1.973**	0.468**	0.190*
	(0.365)	(0.345)	(0.073)	(0.071)
Graduate School	4.672**	2.136**	0.550**	0.226*
	(0.464)	(0.404)	(0.095)	(0.091)
Predicted Probability of Completing A-G		9.994**		1.249**
		(0.273)		(0.151)
Predicted Probability Unavailable		3.753**		0.409**
		(0.247)		(0.065)
Constant	7.688**	3.251**	1.066**	0.533**
	(0.462)	(0.403)	(0.086)	(0.106)
Observations	56,713	56,713	56,713	56,713
R-squared	0.156	0.427	0.075	0.169
P-value on F Test of Equal Deviations from Trend	0.041	0.034	0.159	0.188
P-value on F Test of Equal Time Trends	0.001	0.020	0.004	0.032

Robust standard errors, clustered by school, are in parentheses.
** p<0.01, * p<0.05

TABLE B20

Heterogeneity by Parental Education (Outcomes Through Grade 10)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Post * LT High School	1.183*	1.567**	0.237**	0.343**
	(0.502)	(0.447)	(0.086)	(0.074)
Post * High School Graduate	0.855	0.951*	0.258**	0.288**
	(0.449)	(0.395)	(0.096)	(0.084)
Post * Some College	1.099**	1.009**	0.276**	0.266**
	(0.242)	(0.211)	(0.083)	(0.077)
Post * College Graduate	0.020	0.268	0.076	0.142*
	(0.271)	(0.243)	(0.087)	(0.067)
Post * Graduate School	0.938**	0.629**	0.285**	0.220**
	(0.234)	(0.194)	(0.057)	(0.048)
Graduation Year * LT High School	0.102	-0.055	0.046*	0.007
	(0.110)	(0.096)	(0.023)	(0.019)
Graduation Year * High School Graduate	0.126	-0.051	0.038	-0.003
	(0.090)	(0.084)	(0.022)	(0.020)
Graduation Year * Some College	0.015	-0.114	0.017	-0.012
	(0.070)	(0.067)	(0.024)	(0.020)
Graduation Year * College Graduate	0.268**	-0.056	0.062**	-0.011
	(0.070)	(0.074)	(0.019)	(0.017)
Graduation Year * Graduate School	0.079	-0.165*	0.012	-0.044**
	(0.071)	(0.065)	(0.018)	(0.010)
High School Graduate	1.691**	1.044**	0.264**	0.111
	(0.371)	(0.338)	(0.069)	(0.069)
Some College	3.666**	2.133**	0.734**	0.369**
	(0.502)	(0.485)	(0.106)	(0.103)
College Graduate	6.325**	3.115**	1.402**	0.641**
	(0.620)	(0.553)	(0.137)	(0.119)
Graduate School	6.880**	3.209**	1.535**	0.664**
	(0.707)	(0.602)	(0.158)	(0.113)
Predicted Probability of Completing A-G		14.651**		3.552**
		(0.437)		(0.086)
Predicted Probability Unavailable		5.888**		1.583**
		(0.321)		(0.102)
Constant	15.021**	8.290**	2.113**	0.426**
	(0.818)	(0.786)	(0.153)	(0.129)
Observations	46,425	46,425	46,425	46,425
R-squared	0.137	0.380	0.141	0.371
P-value on F Test of Equal Deviations from Trend	0.009	0.012	0.030	0.022
P-value on F Test of Equal Time Trends	0.005	0.237	0.012	0.049

Robust standard errors, clustered by school, are in parentheses.
** p<0.01, * p<0.05

TABLE B21

Heterogeneity by Parental Education (Outcomes Through Grade 11)

VARIABLES	(1) Course Semesters	(2) Course Semesters	(3) Subject Areas	(4) Subject Areas
Post * LT High School	1.270	1.840**	0.204	0.321**
	(0.690)	(0.672)	(0.121)	(0.120)
Post * High School Graduate	1.033*	1.291**	0.188	0.239*
	(0.485)	(0.466)	(0.102)	(0.094)
Post * Some College	1.482**	1.552**	0.224**	0.246**
	(0.350)	(0.317)	(0.066)	(0.063)
Post * College Graduate	0.067	0.454	0.049	0.126*
	(0.348)	(0.283)	(0.074)	(0.060)
Post * Graduate School	0.998*	0.838*	0.253**	0.229**
	(0.412)	(0.346)	(0.076)	(0.072)
Graduation Year * LT High School	0.247	0.026	0.058	0.016
	(0.176)	(0.164)	(0.031)	(0.030)
Graduation Year * High School Graduate	0.254	0.023	0.062*	0.020
	(0.150)	(0.132)	(0.029)	(0.026)
Graduation Year * Some College	0.100	-0.075	0.045	0.013
	(0.112)	(0.102)	(0.022)	(0.019)
Graduation Year * College Graduate	0.413**	-0.004	0.071**	-0.004
	(0.108)	(0.098)	(0.022)	(0.019)
Graduation Year * Graduate School	0.238*	-0.079	0.017	-0.040*
	(0.110)	(0.095)	(0.019)	(0.018)
High School Graduate	1.937**	1.150*	0.351**	0.206*
	(0.511)	(0.443)	(0.092)	(0.081)
Some College	4.297**	2.356**	0.881**	0.517**
	(0.762)	(0.705)	(0.129)	(0.113)
College Graduate	7.429**	3.441**	1.388**	0.645**
	(0.871)	(0.748)	(0.150)	(0.114)
Graduate School	8.200**	3.643**	1.404**	0.554**
	(0.994)	(0.825)	(0.169)	(0.122)
Predicted Probability of Completing A-G		18.194**		3.469**
		(0.753)		(0.180)
Predicted Probability Unavailable		7.615**		1.611**
		(0.471)		(0.102)
Constant	24.437**	15.746**	3.854**	2.143**
	(1.142)	(1.186)	(0.175)	(0.215)
Observations	37,239	37,239	37,239	37,239
R-squared	0.115	0.326	0.106	0.282
P-value on F Test of Equal Deviations from Trend	0.001	0.000	0.002	0.118
P-value on F Test of Equal Time Trends	0.001	0.723	0.008	0.105

Robust standard errors, clustered by school, are in parentheses.
** p<0.01, * p<0.05

The Graduation Rate for the Class of 2016 is Likely to Fall Below Recent Rates

We next estimate what share of the class of 2016 is likely to graduate on time. We classify each student as being "on track" or "off track" based on how many a-g courses he or she has remaining (as of August 2015) and how many can feasibly be taken in a single school year.

We deem that students are on track if they have 12 or fewer overall a-g semester credits to go, and no more than two credits to go in any one subject area. These judgments are based on students typically taking a maximum of 12 semester courses per year. Further, due to one course being a prerequisite for the next course within each subject, we assume that students can complete at most two semester courses in a given subject area between September 2015 and June 2016.

As stated in the text, we find 73% of students in the class of 2016 to be on track using this method, and 27% of students to be off track. We next cross-tabulate students' on track status with whether their cumulative high school GPA is at least 2.0. To do this, we compute cumulative GPA figures from raw transcript data. To the best of our ability, we include all courses that count toward a student's cumulative high school GPA, including classes taken during summer school or relevant coursework at community colleges, while also adding bonus points for Advanced Placement courses and replicating the school district's policies on grade suppression and replacement for failing grades[1]. Once overlaying the GPA requirement, our overall estimate of the percentage of students on track to graduate in June 2016 is 72%.

The vast majority of students who are on track by a-g coursework are also meeting the district's 2.0 GPA requirement. However, many students who are *off* track by a-g coursework are also struggling with cumulative high school GPA. By our calculations, about half of these students currently have cumulative GPA below 2.0. Roughly 13% of the class of 2016 thus faces "double jeopardy" in being off track by both a-g coursework and GPA.

How Far Off Track Are Students in the Class of 2016?

In this section, we provide additional details on exactly how much coursework students in the class of 2016 have remaining to fulfill the a-g requirements. Figure 7 in the text shows a histogram of how many subject areas students have more than one year's worth of credits still to complete, while Figure 8 provides a breakdown by the number of semester credits remaining in each subject.

Figure 8 also allows readers to see the percentage of students off track in each subject area. This can be seen in tabular form in Table B22. For comparison, this table also shows the historical completion rate by subject for students in the classes of 2011-2013.

[1] San Diego Unified Administrative Procedure number 4770.

TABLE B22

	Social Sciences	English	Math	Science	World Language	VPA	Part g
Percent Off Track, Class of 2016	7.5	23.1	11.7	8.2	9.4	0.0	0.0
Percent On Track, Class of 2016	92.5	76.9	88.3	91.8	90.6	100.0	100.0
Percent Completing, Classes of 2011-2013	83.0	74.3	75.5	87.6	75.5	88.9	95.2

SOURCES: Authors' calculations.

NOTES: Students are deemed off track in a given subject if they have 3 or more semester credits remaining as of August 2015. The domain for the classes of 2011-2013 imposes the same restrictions as used for the class of 2016.

As stated in the text, English and math currently have the largest shares of students off track. This is not surprising, given that English, math, and world language had the lowest historical completion rates. What is interesting is that improvement in these subjects has not been uniform. While the on track rates for math and world language are noticeably above their historical completion rates, this is not the case for English.

Table B23 provides additional detail about observed improvement by subject area. Here, the coefficients on 'class of 2016' show the change in the number of semester credits completed, by subject, through grade 11 relative to past trends. Echoing the earlier statement, math and world language have shown greater improvement in terms of semester credits than has English. In fact, of all the a-g subjects, English trails only the elective requirement (part g) in its estimated improvement.

TABLE B23

Course Semesters Completed by Subject (Outcomes Through Grade 11)

VARIABLES	(1) Social Studies	(2) English	(3) Math	(4) Science	(5) World Language	(6) VPA	(7) Part g
Class of 2016	0.200*	0.167**	0.284**	0.341**	0.280**	0.185*	-0.415**
	(0.085)	(0.062)	(0.104)	(0.077)	(0.090)	(0.085)	(0.089)
Graduation Year (Minus 2016)	-0.010	-0.033	-0.014	-0.039	0.019	0.045	0.133**
	(0.019)	(0.017)	(0.031)	(0.031)	(0.032)	(0.023)	(0.019)
Predicted Probability of Completing A-G	2.455**	2.564**	5.907**	4.407**	5.464**	0.798**	-0.346
	(0.152)	(0.172)	(0.206)	(0.138)	(0.207)	(0.267)	(0.186)
Predicted Probability Unavailable	1.064**	0.967**	2.421**	1.965**	2.121**	0.229	-0.291*
	(0.115)	(0.102)	(0.163)	(0.142)	(0.201)	(0.152)	(0.116)
Constant	2.193**	3.768**	3.015**	1.830**	1.138**	2.134**	2.116**
	(0.116)	(0.166)	(0.210)	(0.149)	(0.241)	(0.236)	(0.168)
Observations	49,067	49,067	49,067	49,067	49,067	49,067	49,067
R-squared	0.160	0.133	0.304	0.249	0.280	0.014	0.022

Robust standard errors, clustered by school, are in parentheses.
** p<0.01, * p<0.05

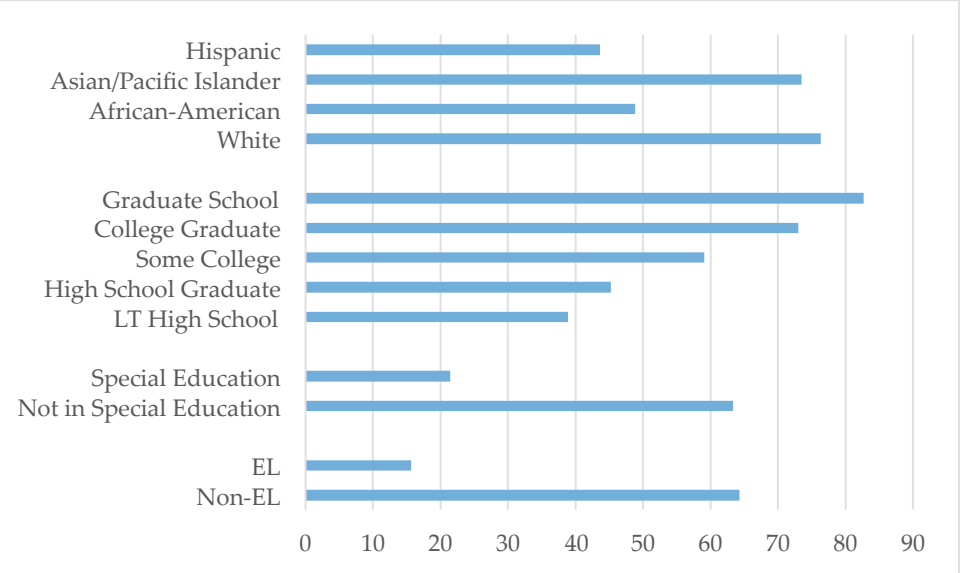
The Class of 2016: How Many Are Likely to Become Eligible to Attend CSU or UC?

Earlier, we found 73% of students in the class of 2016 to be on track to complete the a-g requirements by June 2016 with grades of D or better. Conducting a similar exercise with grades of C or better gives an "on track for UC/CSU" rate of 59%. We caveat that this estimate may be slightly too optimistic, since the method assumes students actually take and pass all remaining courses. Estimating a probit model based on coursework through grade 11 produces an alternative estimate of 55% on track. It is encouraging, however, that both 55% and 59% are above the rates recently observed of SDUSD graduates completing the a-g sequence with grades of C or better (47.9% for the class of 2014),.

As with the 'D or better' case, we again find that on track status varies substantially across subgroups and that students vary in the exact amount of coursework remaining. Figures B1 through B3 below show information similar to Figures 6-8 of the main text, but for grades of C or better.

FIGURE B1

The percentage of students in the class of 2016 who are on track to complete the a-g coursework with grades of C or better by June 2016 varies dramatically by student group

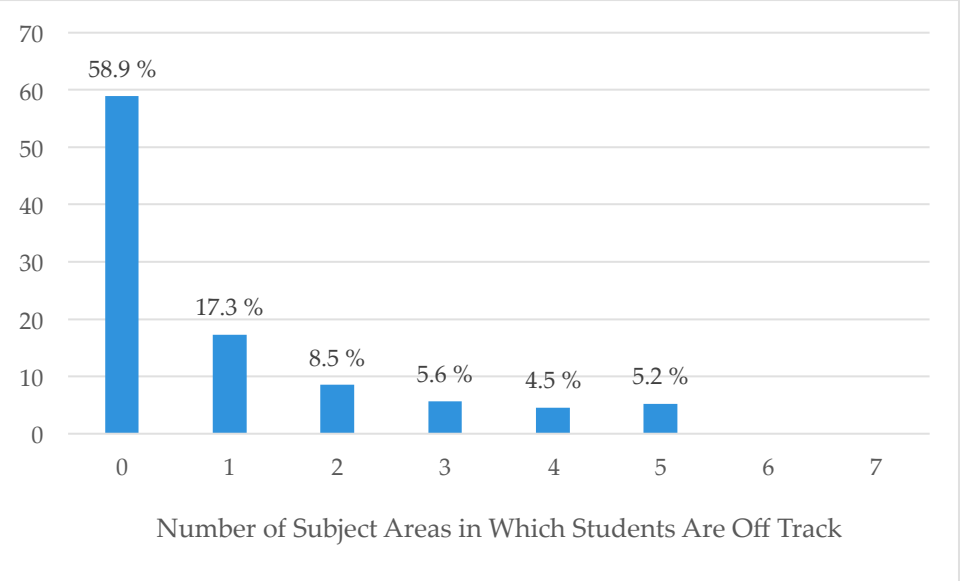


SOURCE: Authors' calculations based on student administrative records.

NOTE: The bar shows, for students in the stated subgroup of the class of 2016, the percentage who are on track to complete the a-g coursework with grades of C or better in time to graduate in June.

FIGURE B2

The percentage of students in the class of 2016 by the number of subject areas in which they have more than a year of material to complete in grade 12 with grades of C or better

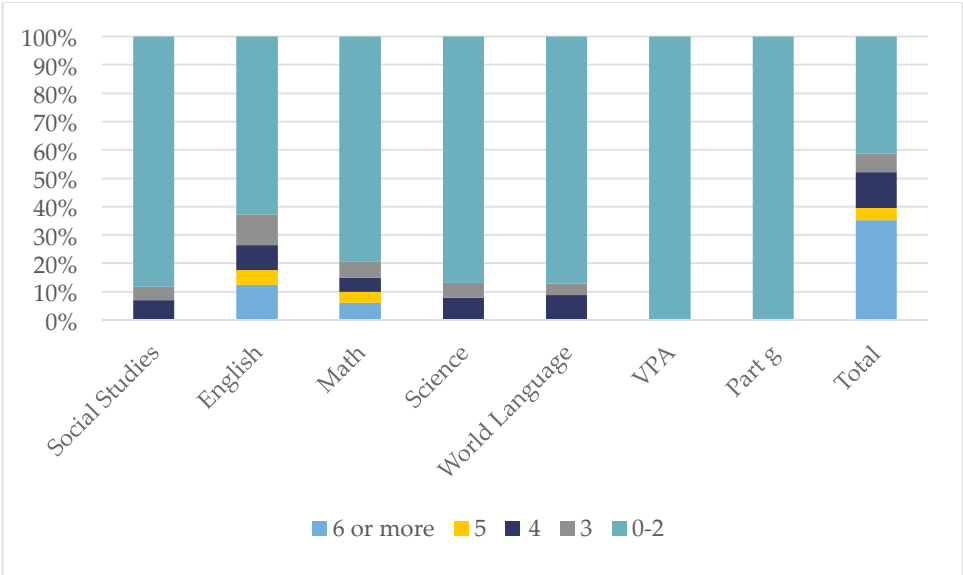


SOURCE: Authors' calculations based on student administrative records

NOTE: The bar shows, for students in the class of 2016, the distribution of the number of subject areas in which they have more than a year's worth of work (more than 2 semester courses) yet to complete during grade 12 with grades of C or better.

FIGURE B3

A breakdown of the class of 2016 by the number of semester courses yet to complete in grade 12 by each a-g subject area with grades of C or better



SOURCE: Authors' calculations based on student administrative records.

NOTE: The bar shows, in the class of 2016, the percentage of students by the number of courses yet to complete in a given subject area with grades of C or better during grade 12.

Unintended Consequences?

For each unintended consequence mentioned in the main text, we estimated a linear regression model that mimicked the main models for course completion, changing only the dependent variable. Each model included a linear time trend to allow for linear differences across cohorts, plus a dummy variable for each class facing the new graduation requirement.

In a second version of each model we additionally controlled for the predicted likelihood that each student eventually completes the a-g coursework, based on grade 6 characteristics, plus a dummy variable indicating whether this variable was missing. Our motivation here was the same as before: academic readiness as of grade 6 is unlikely to be caused by the a-g policy itself, but could explain some of these side effect outcomes (such as the likelihood of missing school in grades 9, 10, or 11).

Tables B24 to B26 show models of the following outcomes: percentage of days absent in the given year; GPA in the given year; cumulative high school GPA (up through the given year); whether cumulative GPA was at least 2.0; and the cumulative number of Career and Technical Education (CTE) courses completed (here measured in year-long courses, rather than semesters).

We find virtually no evidence of any adverse breaks from trend for these outcomes for the affected graduating classes (2016-2018). The lone exception is that the class of 2018 may have a higher rate of absences in grade 9 compared to past trends.

TABLE B24

Unintended Consequences (Outcomes Through Grade 9)

VARIABLES	(1) Absent Pct	(2) Absent Pct	(3) GPA That Year	(4) GPA That Year	(5) Cum. HS GPA	(6) Cum. HS GPA	(7) Cum. HS GPA >= 2.0	(8) Cum. HS GPA >= 2.0	(9) Cumulative CTE	(10) Cumulative CTE
Class of 2016	-0.066	-0.050	0.034	0.051	0.038	0.053*	0.009	0.015	0.049	0.042
	(0.233)	(0.225)	(0.026)	(0.026)	(0.026)	(0.025)	(0.010)	(0.010)	(0.040)	(0.040)
Class of 2017	0.715	0.784	0.003	0.009	0.008	0.013	0.002	0.004	0.050	0.039
	(0.636)	(0.636)	(0.037)	(0.032)	(0.037)	(0.033)	(0.017)	(0.016)	(0.050)	(0.050)
Class of 2018	1.126	1.246*	-0.013	-0.018	0.006	-0.001	-0.012	-0.014	0.010	-0.003
	(0.633)	(0.619)	(0.044)	(0.036)	(0.044)	(0.038)	(0.017)	(0.015)	(0.059)	(0.059)
Graduation Year (Minus 2016)	-0.264**	-0.141*	0.045**	0.007	0.045**	0.008	0.015**	0.002	-0.009	-0.013
	(0.071)	(0.062)	(0.009)	(0.008)	(0.009)	(0.008)	(0.004)	(0.003)	(0.011)	(0.011)
Predicted Probability of Completing A-G		-7.261**		2.570**		2.567**		0.902**		0.110
		(0.481)		(0.066)		(0.062)		(0.025)		(0.091)
Predicted Probability Unavailable		-2.771**		1.314**		1.314**		0.464**		-0.063
		(0.276)		(0.066)		(0.066)		(0.021)		(0.054)
Constant	4.265**	8.251**	2.625**	1.102**	2.613**	1.093**	0.742**	0.207**	0.504**	0.478**
	(0.351)	(0.380)	(0.090)	(0.065)	(0.090)	(0.061)	(0.033)	(0.029)	(0.052)	(0.081)
Observations	73,606	73,606	73,060	73,060	73,157	73,157	73,157	73,157	73,548	73,548
R-squared	0.004	0.050	0.012	0.325	0.013	0.331	0.007	0.210	0.001	0.010
Mean from Classes of 2011-2013	5.353	5.353	2.442	2.442	2.426	2.426	0.681	0.681	0.522	0.522

Robust standard errors, clustered by school, are in parentheses.

** p<0.01, * p<0.05

TABLE B25

Unintended Consequences (Outcomes Through Grade 10)

VARIABLES	(1) Absent Pct	(2) Absent Pct	(3) GPA That Year	(4) GPA That Year	(5) Cum. HS GPA	(6) Cum. HS GPA	(7) Cum. HS GPA >= 2.0	(8) Cum. HS GPA >= 2.0	(9) Cumulative CTE	(10) Cumulative CTE
Class of 2016	0.534	0.508	0.021	0.041	0.026	0.048*	0.004	0.012	0.083	0.076
	(0.566)	(0.564)	(0.029)	(0.027)	(0.025)	(0.021)	(0.011)	(0.010)	(0.049)	(0.048)
Class of 2017	1.046	1.051	0.009	0.023	-0.000	0.016	-0.007	-0.001	0.084	0.074
	(0.614)	(0.612)	(0.037)	(0.033)	(0.030)	(0.025)	(0.014)	(0.011)	(0.065)	(0.064)
Graduation Year (Minus 2016)	-0.250**	-0.123*	0.041**	0.003	0.042**	0.003	0.014**	0.001	-0.025	-0.027
	(0.063)	(0.058)	(0.007)	(0.007)	(0.007)	(0.006)	(0.003)	(0.002)	(0.017)	(0.018)
Predicted Probability of Completing A-G		-7.333**		2.498**		2.554**		0.874**		0.015
		(0.510)		(0.053)		(0.056)		(0.028)		(0.117)
Predicted Probability Unavailable		-3.174**		1.316**		1.343**		0.464**		-0.119
		(0.331)		(0.073)		(0.073)		(0.022)		(0.076)
Constant	4.423**	8.674**	2.617**	1.096**	2.732**	1.178**	0.780**	0.247**	0.774**	0.804**
	(0.317)	(0.397)	(0.087)	(0.050)	(0.086)	(0.049)	(0.029)	(0.030)	(0.085)	(0.122)
Observations	60,194	60,194	59,580	59,580	59,981	59,981	59,981	59,981	60,164	60,164
R-squared	0.002	0.043	0.009	0.309	0.010	0.364	0.005	0.209	0.002	0.006
Mean from Classes of 2011-2013	5.727	5.727	2.442	2.442	2.556	2.556	0.720	0.720	0.854	0.854

Robust standard errors, clustered by school, are in parentheses.
** p<0.01, * p<0.05

TABLE B26

Unintended Consequences (Outcomes Through Grade 11)

VARIABLES	(1) Absent Pct	(2) Absent Pct	(3) GPA That Year	(4) GPA That Year	(5) Cum. HS GPA	(6) Cum. HS GPA	(7) Cum. HS GPA >= 2.0	(8) Cum. HS GPA >= 2.0	(9) Cumulative CTE	(10) Cumulative CTE
Class of 2016	0.238	0.181	0.029	0.052	0.021	0.050*	0.003	0.012	0.113	0.104
	(0.272)	(0.278)	(0.037)	(0.034)	(0.027)	(0.023)	(0.011)	(0.011)	(0.066)	(0.065)
Graduation Year (Minus 2016)	-0.164	-0.050	0.035**	-0.002	0.047**	0.005	0.014**	0.001	-0.026	-0.029
	(0.099)	(0.099)	(0.006)	(0.006)	(0.009)	(0.006)	(0.003)	(0.003)	(0.029)	(0.029)
Predicted Probability of Completing A-G		-6.301**		2.157**		2.463**		0.761**		-0.030
		(0.624)		(0.056)		(0.056)		(0.036)		(0.155)
Predicted Probability Unavailable		-2.981**		1.130**		1.316**		0.412**		-0.200
		(0.392)		(0.067)		(0.072)		(0.021)		(0.101)
Constant	4.723**	8.560**	2.741**	1.394**	2.924**	1.381**	0.839**	0.361**	1.398**	1.470**
	(0.462)	(0.577)	(0.081)	(0.059)	(0.083)	(0.045)	(0.026)	(0.034)	(0.144)	(0.195)
Observations	48,678	48,678	48,011	48,011	48,419	48,419	48,419	48,419	48,582	48,582
R-squared	0.001	0.029	0.006	0.270	0.012	0.379	0.005	0.184	0.001	0.005
Mean from Classes of 2011-2013	5.390	5.390	2.587	2.587	2.729	2.729	0.782	0.782	1.476	1.476

Robust standard errors, clustered by school, are in parentheses.
** p<0.01, * p<0.05

Our interest in CTE coursework comes from the fact that these courses are popular among students but typically do not qualify for a-g credit. Because of this, it is possible that CTE course-taking might decline once students are required to take more a-g courses. This does not appear to have happened.

We also explored the possibility that students might take a larger number of overall courses per year. This could allow students to take more a-g courses while maintaining past levels of CTE coursework. For this, we estimated models of the *total number of credits* attempted, both annually and cumulatively in high school. We found no significant break from trend for cohorts subject to the new requirements in any of grades 9, 10, and 11. Results of those models are not included but are available upon request.

Finally, we explored whether the new graduation requirements have affected the rates of exit from regular district schools. If the new requirements prove difficult for some students, they may decide to transfer to either to district charter schools (which do not impose the a-g requirement) or out of the district entirely. Table B27 below shows results for exiting to charter schools, while Table B28 shows results for exiting the district.

In these tables, a column heading of '8-10' means the exit variable is defined as whether a student exited by 10th grade given that they

attended a traditional public school in SDUSD for 8th grade. The bottom of Tables B27 and B28 also displays the prior levels of each of these exit rates, based on the classes of 2011-2013. As stated in the main text, we find no evidence of increased exit to SDUSD charter schools. We find occasional evidence of increased exit from SDUSD entirely, but with small magnitudes.

TABLE B27

Exit to SDUSD Charter Schools

	(1)	(2)	(4)	(5)	(7)	(8)	(10)	(11)	(13)	(14)
VARIABLES	8-9	8-9	8-10	8-10	8-11	8-11	9-10	9-10	9-11	9-11
Graduation Year (Minus 2016)	0.003	0.004	0.003	0.004	-0.006	-0.004	-0.000	0.001	-0.007	-0.005
	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.004)	(0.001)	(0.001)	(0.005)	(0.004)
Class of 2016	-0.002	-0.002	-0.042	-0.043	-0.035	-0.035	-0.017	-0.017	-0.022	-0.022
	(0.004)	(0.004)	(0.027)	(0.027)	(0.026)	(0.026)	(0.021)	(0.020)	(0.023)	(0.023)
Class of 2017	-0.026	-0.026	-0.043	-0.044			-0.023	-0.023		
	(0.018)	(0.018)	(0.028)	(0.028)			(0.019)	(0.019)		
Class of 2018	-0.030	-0.030								
	(0.019)	(0.019)								
Predicted Probability of Completing A-G		-0.035		-0.065		-0.120		-0.046		-0.105
		(0.018)		(0.036)		(0.069)		(0.028)		(0.066)
Predicted Probability Unavailable		-0.013		-0.030		-0.059		-0.021		-0.053
		(0.010)		(0.018)		(0.033)		(0.013)		(0.032)
Constant	0.041*	0.060*	0.061*	0.100*	0.054	0.127	0.030	0.057	0.036	0.100
	(0.017)	(0.025)	(0.029)	(0.047)	(0.028)	(0.067)	(0.020)	(0.035)	(0.023)	(0.061)
Observations	63,496	63,496	53,564	53,564	44,463	44,463	61,876	61,876	51,308	51,308
R-squared	0.002	0.005	0.005	0.011	0.007	0.020	0.003	0.007	0.007	0.018
Mean Exit Rate for Classes of 2011-2013	0.025	0.025	0.048	0.048	0.081	0.081	0.030	0.030	0.067	0.067

Robust standard errors, clustered by school, are in parentheses.

** p<0.01, * p<0.05

TABLE B28

Exit from SDUSD

	(1)	(2)	(4)	(5)	(7)	(8)	(10)	(11)	(13)	(14)
VARIABLES	8-9	8-9	8-10	8-10	8-11	8-11	9-10	9-10	9-11	9-11
Graduation Year (Minus 2016)	-0.002**	-0.002**	-0.003**	-0.002**	-0.003**	-0.003**	-0.001**	-0.001**	-0.002**	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Class of 2016	0.002*	0.002*	0.003*	0.004*	0.004*	0.004*	0.003**	0.003**	0.002	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Class of 2017	0.005**	0.005**	0.005*	0.005*			0.002	0.003*		
	(0.002)	(0.002)	(0.002)	(0.002)			(0.001)	(0.001)		
Class of 2018	0.006**	0.007**								
	(0.002)	(0.002)								
Predicted Probability of Completing A-G		-0.001		-0.005**		-0.016**		-0.003*		-0.015**
		(0.001)		(0.002)		(0.003)		(0.001)		(0.003)
Predicted Probability Unavailable		0.006*		0.009*		0.006		0.004**		0.002
		(0.003)		(0.004)		(0.005)		(0.001)		(0.002)
Constant	-0.002*	-0.003*	-0.001	-0.001	0.000	0.007*	-0.000	-0.000	0.002	0.008**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.002)
Observations	63,741	63,741	53,916	53,916	44,930	44,930	62,099	62,099	51,726	51,726
R-squared	0.004	0.006	0.004	0.008	0.003	0.009	0.001	0.004	0.001	0.006
Mean Exit Rate for Classes of 2011-2013	0.089	0.089	0.142	0.142	0.190	0.190	0.079	0.079	0.146	0.146

Robust standard errors, clustered by school, are in parentheses.

** p<0.01, * p<0.05