

An Evaluation of California Partnership Academies

Charting the Path from High School to
Postsecondary Enrollment

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OVERVIEW

The transition from high school into postsecondary education and a career has become particularly challenging given today's complex, fast-moving, and highly technological economy. To combat this problem, one approach widely adopted in the United States is the career academy model, which combines a college-preparatory and career and technical curriculum with a career theme and is often structured as a small learning community within a larger high school. A landmark MDRC randomized controlled trial of career academies, starting in the mid-1990s, found sustained earnings gains for academy participants in the eight years after expected high school completion.

Shifts in the labor market, reforms to secondary education, and a growth in both high school graduation and postsecondary enrollment rates across the United States prompt new questions about how participating in career academies may affect current students' academic and labor outcomes. MDRC is currently conducting another long-term randomized controlled trial of career academies to help answer these questions. This study explores California Partnership Academies (CPAs), which are partially state-funded career academies within high schools across California. The study will follow participants for the eight years after expected high school graduation and look at the impacts on students' high school, postsecondary education, and employment and earnings outcomes.

This report explores the impacts of CPAs on students' high school graduation and college readiness at the end of high school as well as their college enrollment during the first year after graduation. It also examines the differences between the school experiences of the students who were offered a spot in a CPA (CPA group) and of those who were not offered a spot (non-CPA group), as well as some of the early effects of the program on teachers' attention to and expectations of students and on students' collaboration with each other, their perceived relevance of schoolwork, and their plans after high school. Key findings include:

- CPA group students had more experiences related to the three key components of CPAs than those in the non-CPA group, but these features were not exclusive to students in CPAs, and some non-CPA group students reported experiencing some similar types of activities. The three key components are the creation of a small learning community within the larger high school (also called a school within a school), the integration of college-preparatory core academic curricula with career and technical education, and employer partners and work-based learning opportunities.
- The CPAs in this study, along with all schools and districts across the country, were greatly affected by the COVID-19 pandemic and related school closures during the study period. This was especially true for work-based learning opportunities. Most CPA group students had work-based learning opportunities that were canceled, postponed, or changed due to the pandemic. These missed opportunities could dilute the effects of the program.
- Students assigned to CPAs reported more personalized attention from teachers, more collaboration with their classmates, and feeling more prepared for future college and career plans.
- Ninety-three percent of students in the study (both those in the CPA group and those in the non-CPA group) graduated high school on time. Being offered a spot in a CPA did not impact a student's likelihood of graduating. While the state requires half the students in CPAs to be at risk of not graduating high school when entering the program based on a set of indicators (for example, income level, academic proficiency), this graduation rate is quite a bit higher than the state average, which was 86 percent in 2023, suggesting that other factors, such as motivation (all students in the study applied to be in a CPA), may have played a role in the success of these students.
- There was no impact of the CPA model found on students' college readiness nor on their college enrollment in the first year after expected high school graduation—across all students in the

study. Sixty percent of the CPA group had passed the high school courses required for enrollment in a California public university (higher than the state average for high school graduates, which was 50 percent), 33 percent actually enrolled in a four-year institution after high school, and 69 percent enrolled in any college or trade school.

- The CPA model did have positive impacts on readiness for a California university for young women (by 12 percentage points) as well as for those students who were identified as both economically disadvantaged and struggling academically (by 13 percentage points).

This study will provide findings at two more intervals. A report on college completion and labor market outcomes four years after high school graduation will be published in 2028, and a final report, on labor market outcomes for the eight years after high school graduation, will be released in 2032.

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The transition from high school into postsecondary education and a career has become particularly challenging given today’s complex, fast-moving, and highly technological economy. Even as the national high school graduation rate has improved over the past two decades and many states have raised their graduation requirements, high school graduates without postsecondary credentials and career-specific skills lack work opportunities.¹ Many students—particularly students of color, students from lower-income backgrounds, and students who are the first in their families to go to college—struggle to attain the credentials needed to reach a comfortable living wage.² To combat this problem, one approach widely adopted in the United States is the career academy model, which combines a college-preparatory and career and technical curriculum with a career theme and is often structured as a small learning community within a larger high school. For over 50 years, career academies have aimed to blend academic rigor, a curriculum spanning college readiness and career skills, and engaging and relevant experience in the workplace to help prepare students for successful transitions to postsecondary education and, ultimately, to productive and gainful employment.

A landmark MDRC randomized controlled trial of career academies, starting in the mid-1990s, followed study participants for eight years after high school graduation.³ While the study did not find impacts of career academies on high school graduation and postsecondary degree attainment, researchers did find sustained earnings gains for academy participants, with these labor market impacts concentrated among young men.⁴ In the years since that study, career academies have proliferated from a few hundred to thousands across the United States, and a general movement of career and technical education (CTE) has taken hold, with other types of career-themed college preparatory programs intended to prepare students for both careers and a variety of postsecondary educational choices also flourishing.⁵ Over this period, there have been many other reforms to high school education, rates of high school graduation and participation in postsecondary education have increased, and much of the U.S. labor market has shifted substantially.⁶ These changes give rise to new questions about the current impacts of career academies. Do today’s career academies have impacts on high school completion and

1 National Center for Education Statistics (2024b); Gao (2021).

2 National Center for Education Statistics (2019, 2023a, 2024a); Glasmeier (2023).

3 In a randomized controlled trial, study enrollees are randomly assigned either to a program group that is eligible to participate in the intervention or to a control group that is not eligible to participate in the intervention. By comparing the outcomes of the two groups, a study can estimate the impact of the intervention.

4 Kemple (2008).

5 Aka (2024); Warner et al. (2016); Rosen et al. (2023).

6 Unterman, Corrin, and Price (2023); National Center for Education Statistics (2023b); Committee on Education and the Workforce (2023).

postsecondary enrollment and degree attainment in ways they did not at the time of the earlier study? Do today's career academies still have positive impacts on the employment outcomes for young people?

To explore these questions, MDRC is conducting a second long-term randomized controlled trial of career academies. The study explores California Partnership Academies (CPAs), which are partially state-funded career academies within high schools across California. This study was developed in conjunction with the California Department of Education (CDE) as well as the College and Career Academy Support Network, which greatly supported recruitment efforts and provided enhanced technical assistance to participating CPAs to ensure high levels of implementation. All this work has been funded through generous grants from Arnold Ventures.

There are hundreds of CPAs across California, as well as hundreds of other similar career-themed academy and pathway programs.⁷ Many high schools and some school districts (such as Oakland Unified and Long Beach Unified) require all high school students to participate in a pathway.⁸ Further, even in contexts that do not include these specific models, many schools and school districts have been expanding their portfolios of career-connected learning opportunities for all students, including providing access to applied course work, career advising, and work-based learning. As a result, the study team faced significant challenges in identifying contexts in which the CPA experience was likely to be as truly distinctive from the non-CPA experience as was the case for the earlier career academies study.⁹

This report explores the impacts of CPAs on high school graduation rates and college readiness at the end of high school as well as college enrollment the first year after graduation. The study investigates these findings across all students as well as for subgroups of students based on gender and levels of economic and academic disadvantage. The study also looks into outcomes for young men and women because career academies and other similar programs have seen some differences in outcomes by gender.¹⁰ Differences based on level of disadvantage are examined because California has explicitly designed CPAs to support disadvantaged pupils and requires half the students in each CPA to be identified as at risk of not graduating high school when they start the program.¹¹ The study also examines the differences in the school experiences of students who were and were not offered a spot in a CPA, as well as some of the early effects of the program on teachers' attention to and expectations of students and on students' collaboration with each other, perceived relevance of schoolwork, and plans after high school. For the remainder of this report, students offered a spot in a CPA will be referred to as the "CPA group," and those not offered a spot will be referred to as the "non-CPA group."¹²

7 California Department of Education (2024a); Linked Learning Alliance (n.d.).

8 Oakland Unified School District (n.d.); Long Beach Unified School District (n.d.).

9 Later in the report, in the Study Design section, the reader will find information about how to interpret the difference between the students in the CPA and non-CPA groups.

10 Kemple (2008); Rosen et al. (2023).

11 California Education Code (2023).

12 Not all students in the CPA group enrolled in a CPA (about 86 percent did, and 14 percent did not). Similarly, some students in the non-CPA group ended up in a CPA (about 9 percent). See Appendix Table A.14 for details.

Like MDRC’s earlier career academies study, this study will provide findings at three intervals. The next report, to be published in 2028, will share more findings on the impacts on college enrollment over the four years after expected high school graduation as well as college completion and labor market outcomes for those four years. The final report, which will be released in 2032, will explore impacts on labor market outcomes for the eight years after high school graduation.

WHAT ARE CALIFORNIA PARTNERSHIP ACADEMIES?

There are approximately 340 California Partnership Academies operating in high schools across the state of California. CPAs were established in the early 1980s and integrate the key features of career academies, which were first developed and implemented in Philadelphia in the late 1960s. They represent a high school reform movement that focuses on small learning communities centered around a career theme. CPAs are partially funded by state grants through the Career Technical Education Initiative and other funding initiatives. The school district and local companies also provide matching funds to keep the academies running.¹³

CPAs run from ninth or tenth grade through twelfth grade. A high school may have one or more CPAs, and students interested in participating apply the spring before ninth or tenth grade. The state requires that at least half the students in an academy meet the criteria for being what it calls “at promise,” that is potentially at risk, of not graduating high school.¹⁴ CPAs encompass a variety of career themes that live under one of 15 industry sectors sanctioned by the state, such as health science and medical technology, agriculture and natural resources, public service, engineering and architecture, and arts, media, and entertainment.¹⁵ Schools choose broad career themes for their academies based on the needs of the local labor market, focusing on industries as opposed to specific jobs.¹⁶

Career themes, size, and academic and work-based learning offerings vary, but all CPAs include three key components, as shown in the first row of Figure 1. First, all CPAs operate as a small school within the larger high school to offer students a small learning community with a close “family-like” atmosphere even within a large comprehensive high school.¹⁷ To accomplish this, a dedicated team of teachers provide instruction on different subject matter areas but work

13 California Department of Education (2024a).

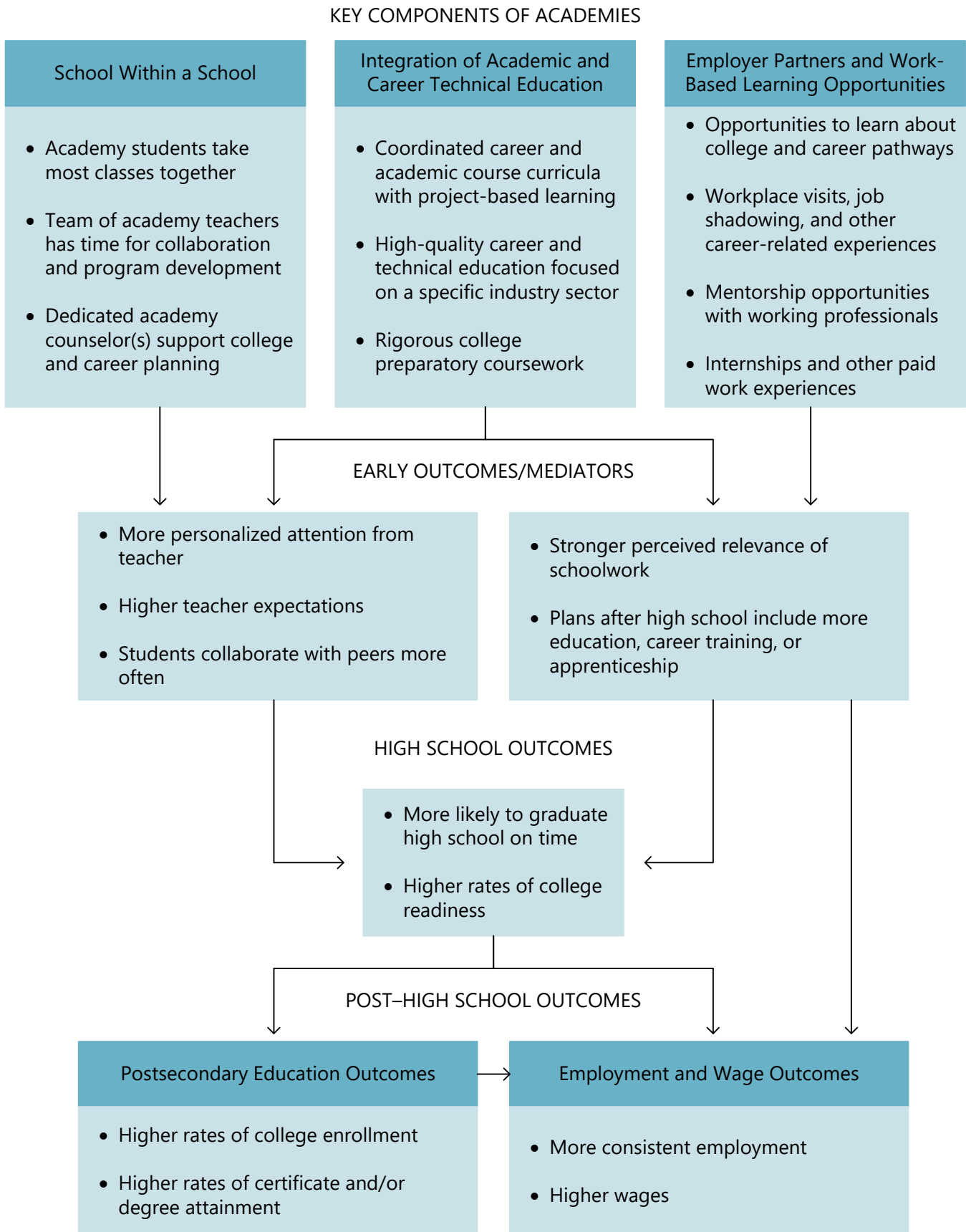
14 California law currently states: “‘at-promise pupil’ means a pupil enrolled in high school who is at risk of dropping out of school, as indicated by at least three of the following criteria: (1) Past record of irregular attendance. For purposes of this section, ‘irregular attendance’ means absence from school 20 percent or more of the school year. (2) Past record of underachievement in which the pupil is at least one-third of a year behind the coursework for the respective grade level, or as demonstrated by credits achieved. (3) Past record of low motivation or a disinterest in the regular school program. (4) Disadvantaged economically. (5) Scoring below basic or far below basic in mathematics or English language arts on the standardized test... (6) Maintaining a grade point average of 2.2 or below, or the equivalent of a C minus.” See California Education Code (2023).

15 California Education Code (2023).

16 California Department of Education (2024a).

17 California Department of Education (2024a).

FIGURE 1. How California Partnership Academies Intend to Improve Student Outcomes



together, with a common preparation time in their school day to collaborate on program development and student support. CPA students in the same grade are scheduled to take most of their courses together. A dedicated counselor who knows the CPA provides support for individual students around their specific college and career interests.

The second CPA component is the integration of academic and career technical curricula, with a focus on college preparation.¹⁸ Each CPA follows a coordinated curriculum for each grade level. These curricula combine rigorous college-preparatory courses in core subject matter (English, math, social science, and science) with sequenced high-quality career and technical education courses. Teachers often work together to provide multiple project-based learning opportunities that combine core subject matter with CTE, and they regularly connect students with industry and postsecondary-education partners to provide opportunities for learning outside the classroom. Emphasis is placed on student achievement and preparing students for positive postsecondary outcomes.

A third key component has each CPA partner with local employers, who provide program guidance as well as work-based learning opportunities, with employer representatives serving on the academy steering committee and helping to develop the career technical curriculum.¹⁹ Motivational activities with private-sector involvement include mentoring by career professionals, classroom speakers, field trips, and explorations of postsecondary education and career options. A central feature of the CPAs is the provision of direct workplace learning experiences, such as job shadowing and internships.

As shown in Figure 1, the CPA theory of change posits that these three key components will lead to more personalized attention from teachers, higher teacher expectations, and more collaboration between students, which will then lead to students having a stronger perceived relevance of schoolwork and better-defined plans after high school that include college and career training. The CPA components are further theorized to lead to more students graduating both on time and better prepared for college. Ultimately, CPAs are hypothesized to result in higher rates of postsecondary completion and stronger labor market outcomes (employment rates and wages).

As noted in the introduction, CPAs are one in a wide array of CTE reforms, and the findings from this study can inform a range of related strategies that incorporate some of the CPA principles and components. The National Career Academy Coalition and NAF (formerly the National Academy Foundation) are two organizations that support the creation and sustainability of thousands of career academies across the United States and promote very similar components to those seen in CPAs.²⁰ A reform popular in California is Linked Learning, an alliance that supports pathways that combine rigorous academics, CTE, work-based learning, and comprehensive support services, including counseling and supplemental instruction.²¹ While CPAs and Linked Learning pathways

18 California Department of Education (2024a).

19 California Department of Education (2024a).

20 National Career Academy Coalition (2024); NAF (n.d.).

21 Linked Learning Alliance (n.d.).

are similar, a significant area where they can diverge is that Linked Learning Alliance pathways do not require the school-within-a school model of CPAs, under which students take most core academic classes together. Still, many CPAs, including some in the study, serve simultaneously as Linked Learning Alliance pathways.

Another example of a growing CTE reform is P-TECH 9-14 schools. These schools enroll students from grade nine through two years of postsecondary education (six years total) and include a three-way partnership among a high school, a community college, and an employer.²² P-TECH schools are different from CPAs in their direct relationships with community colleges through dual enrollment programs that focus on associate's degree attainment for participating students, but they offer an example of a newer model coming out of the career academy movement.

STUDY DESIGN

This study utilizes a student-level random assignment design, which is the gold standard of rigorous program evaluation because it allows for the comparison of two similar groups of students where the only difference between the groups, on average, is whether they were randomly assigned to participate in the CPA. Recruitment of students happened over a three-year period, and the sample includes students entering CPAs in the fall of 2018, 2019, and 2020. Students applied to the academy the spring prior to their point of entry (during either their eighth- or ninth-grade year). All the CPAs in the study had more eligible students apply than the CPA could serve. To fairly assign eligible students to each CPA and to create a high-quality experimental study, students were randomly assigned via a lottery, with one group offered a spot and the other not.²³

The full study sample includes 1,125 students, where 884 students were offered a spot in a CPA and 241 students were not.²⁴ Some of the CPAs in the study ran for three years (tenth through

22 Rosen et al. (2023).

23 The estimates presented in this report are what are known as intent-to-treat (ITT) estimates; that is, each group is made up of students who were assigned to either the program (offered a spot in the CPA) or comparison (not offered a spot in the CPA) group by lottery. This does not mean that all students offered a spot in a CPA enrolled in the CPA, but, in this case, most students did comply with their intended lottery assignment. The reason for using the ITT is that it represents the groups as they were designated by the random assignment experiment. A two-stage least squares (2SLS) instrumental variable (IV) analysis was conducted as a sensitivity test to estimate the Local Average Treatment Effects (LATE), which are the estimates of the average effects of the treatment (enrolling in a CPA) for the "compliers." This test found similar results. (See Appendix A for a discussion of this sensitivity test and Table A.14 for the findings.)

24 Each CPA had a specific number of available spots for students each year. The number of students randomly assigned to not be offered a spot in the program depended on the number of students that applied to the CPA and was often quite a bit smaller than the number of students offered a spot, hence the different totals for the two groups. CPAs often identified a small group of students who were allowed to directly enter the CPA and did not go through the random assignment. These students are not included in the study sample along with those students who did not assent to participate or whose parents did not consent to study participation.

twelfth grade), while others ran for four years (ninth through twelfth grade), so the expected year of students' graduation depends on not only the year they were randomized but also what grade they were in at the time of randomization. There are four years when sample students were expected to graduate high school (2020-2021 through 2023-2024).²⁵

The study comprises a total of 15 CPAs. Most only participated in the recruiting and randomizing of students during a single school year, but two participated in randomization during two school years, and one participated in randomization during all three school years. Most CPAs had one random assignment lottery for a given school year, but in some cases, students within a CPA were randomly assigned in two separate lotteries. As noted earlier, the CDE requires 50 percent of each CPA's enrollment to be reserved for students who are what it calls "at promise," or at potential risk, of not graduating high school. Some CPAs utilized two separate lotteries to meet this requirement—one for students identified as "at promise" and one for the rest of the students who had applied to participate in the CPA. In total, there were 25 random assignment lotteries across all schools and cohorts, or groups of students who joined the CPA at the same time and moved through it together.²⁶

Schools in the Study

All schools recruited for the study were California public high schools containing at least one CPA. This study required that participating students not assigned to the CPA not end up in another CPA or similar pathway. This is because the students not assigned to a CPA act as the study's counterfactual or comparison group. Given this, high schools where all or most students attend a CPA or participate in a strong Linked Learning Alliance pathway program or other career academy were excluded from the study. As noted in the introduction, CPAs and other similar programs have become quite popular across the state. It was hard to identify schools that had only one or two CPAs, especially as many schools that had operated one or two successful CPAs in the past have decided to provide students with more options, creating additional CPAs, with different career themes, to extend similar programming to more of their students.

In some cases, all students at a school participate in a CPA or a Linked Learning Alliance pathway. These schools are often referred to as having "wall-to-wall" academies or pathways, and some entire districts, like Oakland Unified and Long Beach Unified, have moved toward the goal

25 See Appendix Table A.1 for more details on the cohorts of students, expected graduation years, and the sample of students in each analysis.

26 Power calculations (statistical tools that help compute the minimum detectable effect, or the smallest change in an outcome that the randomized controlled trial can detect) indicate that the study can statistically detect an effect size of approximately 0.16-0.17 on employment outcomes. The initial goal of the study was to recruit a large enough sample to detect an effect size of 0.15 or higher, but the study team was unable to recruit enough schools and students to meet this goal.

of offering all students such an experience. This limited the pool of schools that could participate in the study and means that those participating may not be representative of the current California landscape more broadly as there may be something different about the study schools (which are *not* “wall-to-wall” academies) that isn’t seen in schools with higher saturations of career academies and pathways.

The study team started the recruitment effort with a list of CPAs rated by the CDE as moderate to strong on implementing, based on the CDE’s annual assessment of these programs for funding purposes. The study team also confirmed with all CPAs being recruited that they were implementing all three of the key CPA components identified in Figure 1. Participating CPAs also needed to have oversubscription (that is, more students applying to the program than could be served) to allow for random assignment. Finding schools and CPAs willing to participate in the study that met these criteria was difficult because, over the years, many popular CPAs expanded to admit more students when they found they had too many applicants (instead of just one cohort of 25-30 students in a grade level participating in the CPA, some CPAs had 60 or even 90 students participating per grade level). Given this, many schools could not participate because they did not have any oversubscription, and the schools that did participate often had limited oversubscription, leading to comparison groups that were smaller than expected (79 percent of the students in the sample are in the CPA group).

Ultimately, the study team did find eligible high schools that represent a broad cross section of California, including large urban, smaller urban, and suburban school districts, largely in southern California but also in central (Bakersfield area) and northern (Sacramento area) California. All the schools include substantial populations of students from lower-income backgrounds. A variety of career themes were represented across the 15 CPAs. There were four health-themed academies; three art, design, and technology academies; two design and engineering academies; and one academy each for home engineering, business and technology, information technology, teacher preparation, public service, and culinary arts.

Students in the Study

As noted previously, 1,125 students were recruited to participate in the study over three years. The students in the study skew female (about 60 percent), unusual for CTE, which often attracts more male students.²⁷ This may be in part due to the combinations of career themes represented by the academies. The sample also includes a large percentage of Hispanic students (51 percent), not surprising for a program based in California, which has a large Hispanic population. Very few students in the study participate in special education.²⁸

27 Perkins Collaborative Research Network (2022).

28 In comparison, about 14 percent of students in California public school systems receive special education services. See National Center for Education Statistics (2024c).

Most students in the study were designated as economically disadvantaged by the California Department of Education (over 60 percent).²⁹ Among the sample of students with eighth-grade standardized test scores, 58 percent did not meet state standards for math, and 45 percent did not meet state standards for English Language Arts (ELA). Additionally, among the sample of students with available data, about 48 percent are economically disadvantaged and did not meet standards on one or both standardized assessments. Only 5 percent of the students are chronically absent (absent more than 10 percent of the school year), and very few are absent more than 20 percent of the school year.³⁰

Overall, the CPA group and non-CPA group were not significantly different from each other prior to participating in the program, suggesting that random assignment worked and created two very similar groups of students and that differences in outcomes can be attributed to the offer to enroll in a CPA and not to other differences between the two groups.³¹ As shown in Table 1, the only characteristic with a statistically significant difference (one that is unlikely to have occurred by chance alone) between the groups is special education status, but very few students across the sample are identified as participating in special education. The students in each group tended to comply with their random assignment group, with 86 percent of students offered a spot in a CPA participating in a CPA and only 9 percent of students not offered a spot in a CPA ever participating in a CPA (see Appendix Table A.14).

FINDINGS FROM THE STUDENT SURVEY

A survey was administered to students during the spring of their senior year of high school.³² To capture responses from all cohorts of students, the survey took place in the spring of 2021, 2022, and 2023. Survey items asked about students' high school experiences, and the data are used to measure *service contrast*, or the difference between the high school experiences (as related to the three key components of the CPA model shown in Figure 1) of the CPA group students and the non-CPA group students. Survey items also asked students about the early outcomes listed in Figure 1. These early outcomes are *mediators*, or mechanisms, such as having personalized

29 As defined by the California Department of Education, a student is considered economically disadvantaged if that student meets at least one of six criteria: (1) the student is eligible for or participating in the Free Meal program or Reduced-Price Meal program, (2) the student is eligible for or participating in the Title I Part C Migrant program, (3) the student is considered homeless, (4) the student is foster program eligible, (5) the student has direct certification, and (6) the student is identified as a tribal foster youth. See California Longitudinal Pupil Achievement Data System (n.d.).

30 See California Department of Education (n.d.-a) for more information about the chronic absenteeism indicator in California.

31 An overall test of the equivalency of the two groups produced a p-value, which measures the probability of obtaining the observed result, assuming that the null hypothesis is true, of 0.601. A p-value this large suggests that there is little likelihood the two groups were different, on average, before participation in the CPA.

32 In one school with two cohorts of students, students were surveyed during their junior rather than their senior year.

TABLE 1. Comparison of Baseline Characteristics for Full Sample

Characteristics (%)	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Male	41.4	39.9	1.6	0.644
Race/ethnicity ^a				
Black, non-Hispanic	4.8	5.9	-1.2	0.472
White, non-Hispanic	21.5	21.6	-0.1	0.962
Hispanic	51.3	51.0	0.3	0.910
Asian	17.0	17.7	-0.7	0.780
Other	5.4	3.8	1.7	0.319
Special education	0.6	1.8	-1.2 *	0.074
Absent for more than 10% of school year	4.9	4.6	0.4	0.825
Absent for more than 20% of school year	0.1	0.4	-0.3	0.383
Economically disadvantaged	61.7	59.2	2.6	0.382
Not meeting standards on state math assessment ^b	58.7	56.7	2.0	0.529
Not meeting standards on state English Language Arts assessment ^b	43.8	49.4	-5.6	0.107
Economically and academically disadvantaged ^b	48.3	48.0	0.2	0.944
Sample size (total = 1,125)	884	241		

SOURCE: MDRC calculations use California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A likelihood ratio test was used to determine whether there is a systematic difference between the two groups, with respect to the characteristics included in this table. The p-value for this test is not statistically significant (p-value = 0.601).

Estimated differences are regression-adjusted for the blocking of random assignment. Values for the CPA group are simple means for all students offered the CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in calculating differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Attendance is measured the school year before students joined the study (eighth or ninth grade). California Smarter Balanced English Language Arts and math test scores are measured in a student's eighth-grade year. All other characteristics are measured the year the student joined the study.

Students are flagged as being economically and academically disadvantaged at baseline if they met the following state criteria: (1) a student is economically disadvantaged, and (2) a student nearly met or did not meet standards on either the mathematics or English Language Arts eighth-grade standardized tests.

Distributions may not add to 100 percent because of rounding.

Sample sizes may vary for some characteristics due to missing values. Only characteristics with more than 5 percent of the sample missing are noted.

^aStudents who said they are Hispanic and chose a race are included only in the Hispanic category. Students who chose American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, or more than one race are also included in the Other category.

^bAbout 6 percent to 7 percent of the study sample are missing data for this characteristic.

relationships with teachers or collaborating with peers, which are theorized to lead to the target outcomes of high school graduation and college readiness.

A major issue with the survey administration was that, due to the COVID-19 pandemic, students were surveyed during a time when many schools were not operating in person or fully in person and a higher percentage of students than usual were not participating in or had left school. Despite these issues, the survey response rate was quite high, with 813 students completing more than 50 percent of the survey out of the 1,125 total students, a survey response rate of 72 percent.³³ One other issue with the survey is that students did not always respond to all survey items, so many items have higher levels of non-response than the overall survey response rate.³⁴ While these limitations suggest readers should interpret the findings with some caution, the survey still provides valuable information about CPA students' school experiences.

High School Experience

As illustrated in Figure 1, the California Department of Education identifies three key components of CPAs (school within a school, integration of academic and career technical education, and employer partners and work-based learning opportunities). The study explores the differences in students' experiences between the CPA and non-CPA groups for each component.

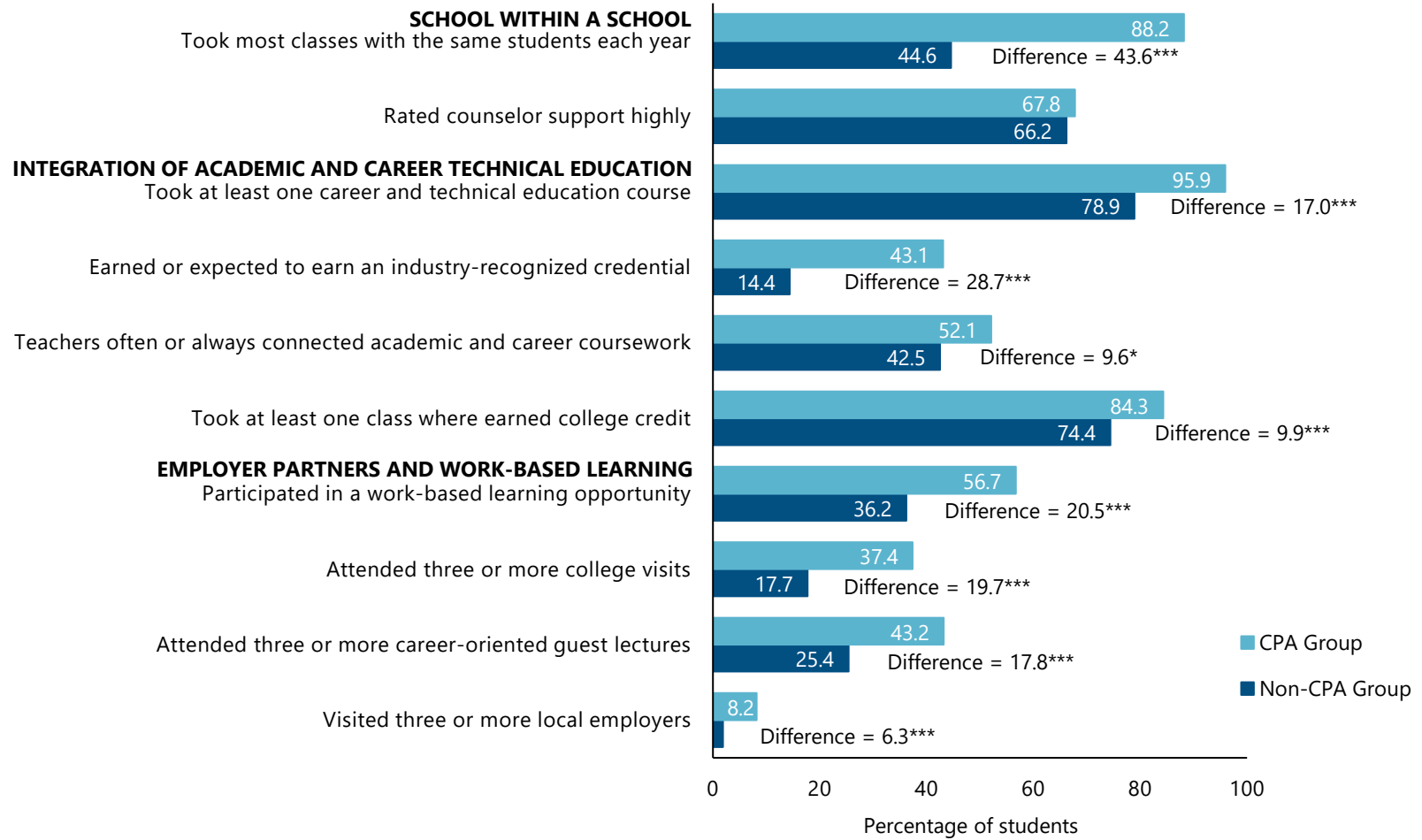
School Within a School

CPAs offer a small learning environment inside a larger high school by providing students in the academy with dedicated teachers across subject areas and a dedicated counselor, who all meet regularly to develop the academy program, plan collaborative activities, and ensure the support of individual students. Academy students also take most of their core and CTE classes together.

33 While the overall response rate was strong, it was particularly hard to find and survey some of the students who were not participating in a CPA. The school-within-a-school model (with its smaller community) made it easier to locate CPA students. Given this, the survey does suffer somewhat from a difference in survey response rates, with 75 percent of students in the CPA group responding and 64 percent of the non-CPA group responding, creating an 11 percentage point difference in response rates. This difference in response rates raises some questions about whether students who responded to the survey are comparable across the two research groups. The survey non-respondents (those who could not be located or refused to participate) were quite different from the survey respondents with respect to baseline characteristics, so the survey findings may not be generalizable to the full sample of students (see Appendix Table A.4). That said, a comparison of the CPA and non-CPA students who responded to the survey reveals that the CPA group students and non-CPA group students do not differ systematically on observable characteristics (see Appendix Table A.5), which lends confidence that comparisons between the CPA and non-CPA survey respondents can still be informative.

34 The study team did two checks on item non-response. First, baseline equivalence tests were run using the sample from the survey item with the smallest sample size (i.e., most missing data/non-response) in each table (Appendix Tables A.6 through A.10). CPA and non-CPA groups were found to be similar even with these more limited samples, providing confidence that even with additional survey item non-response, comparisons between CPA and non-CPA survey respondents can still be informative. Second, all the analyses in each table were run using the smallest sample identified in that table (the measure with the most missing data/non-response). Findings in these analyses were similar to those for analyses that included all respondents for each measure, suggesting that the sample of students with the most missing data/non-response was similar to the full sample of students who responded to at least 50 percent of the survey. These checks build confidence in the survey findings even for items where non-response is high. Still, for survey items with high levels of non-response, results are interpreted only among students who provided a valid response and cannot be generalized to the entire survey sample. See Appendix Tables A.6 through A.10 for more details on the survey items that had high non-response.

FIGURE 2. Students’ Reporting on Their High School Experiences Related to Key Components of California Partnership Academies



SOURCE: MDRC calculations from a survey of study participants during their senior year of high school.

NOTES: Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

As shown in Figure 2, 88 percent of CPA group students reported that they took most of their classes with the same group of peers during their sophomore, junior, and senior years, suggesting that CPAs strongly adhered to the school-within-a-school model. Far fewer, about 45 percent, of non-CPA group students reported taking most of their classes with the same group of peers. CPA group students were 13 percentage points more likely than non-CPA group students to take 2 or 3 classes with the same students and teachers during their senior year and 19 percentage points more likely to take 4 or more classes with the same students and teachers that year. Again, about half of non-CPA group students reported taking 2 or 3 classes with the same students and teacher during their senior year, but very few (only 7 percent) reported taking 4 or more classes with the same students and teacher that year (see Appendix Table A.6 for details).

There are multiple reasons why those in the non-CPA group might report taking more than one course with the same students. It is possible that schools offer other forms of small learning communities beyond CPAs, but it also could be that some of the schools are smaller, so that students may experience a small learning community even without an intentional reform. Academic tracking, where students are placed into courses by ability, could also lead more students to take the same courses together. This result could also be driven, especially in later years of high school, by students' course and teacher preferences. As students have more flexibility in their course schedules during the later years, they may choose courses with teachers they like or with students who have similar interests or both.

As shown in Figure 2, among the students providing answers to these survey items, CPA students were not more likely than non-CPA students to give a high overall rating of the support they received from their counselor. CPA group students did, however, report meeting with a counselor during their senior year about one more time on average than their non-CPA group peers (see Appendix Table A.6 for details).

Integration of Academic and Career Technical Education

CPA teachers coordinate the core academic (math, English, science, and social science) curricula with the CTE curricula and create projects for students that combine different disciplines and provide hands-on learning opportunities. CPAs include both rigorous college preparatory courses and sequenced high-quality CTE courses in a specific career field.

As shown in Figure 2, among the students providing answers for these survey items, CPA group students were more likely than their non-CPA counterparts to take at least one CTE course during high school, to earn an industry-recognized credential, and to have teachers who often or always connected academic and career course work. Not surprisingly, since CPAs require CTE courses each year, almost all the CPA group respondents reported taking at least one CTE course, but 79 percent of non-CPA group respondents also reported taking at least one. So CTE courses were popular across the study sample. On average, CPA students reported taking about four CTE courses, compared with an average of about two for students not assigned to a CPA (see Appendix Table A.7). CPA group students were also 29 percentage points more likely to report that they had earned or expected to earn an industry certification. Industry certifications depend on the career theme of the CPA. Examples include certificates for specific software and

technologies as well as skills certification for cardiopulmonary resuscitation and as an emergency medical technician.

Also shown in Figure 2, CPA group students who responded to these items on the survey were more likely than the non-CPA group to report taking at least one class where they earned or expected to earn college credits. Further, CPA group students were much more likely to report earning career/industry-focused college credits (see Appendix Table A.7 for more information).

Employer Partners and Work-Based Learning Opportunities

CPAs partner with industry leaders in their communities to provide students with a variety of work-based learning opportunities, including site visits, job shadowing, mentorships, internships, and guest speakers. They also partner with local colleges and universities to connect students with career pathway options in their fields of interest.

As shown in Figure 2, among the students responding to the survey item, CPA group students were more likely (by almost 21 percentage points) to participate in some type of work-based learning opportunity compared with non-CPA group students. In particular, they reported participating in almost twice as many job-shadowing experiences, almost nine times as many mentorships, and three times as many career-themed competitions. They were not more likely to participate in paid or unpaid internships, workplace visits, or career-themed summer camps or workshops (see Appendix Table A.8 for more details).

Still, it is worth noting that while CPA students were more likely to report participating in some types of work-based learning, 36 percent of non-CPA students did report participating in work-based learning activities, with job shadowing (11 percent), workplace visits (8 percent), and internships (19 percent) being the most popular types for this group (see Appendix Table A.8 for more details). As noted in the Study Design section, 9 percent of non-CPA students crossed over to participate in a CPA. While these students may account for some of the participation in work-based learning by non-CPA students, it seems the study schools are likely providing students with other work-based learning opportunities outside the CPAs. This level of participation by the non-CPA group may limit the impact found on employment outcomes in later reports. Research utilizing the data from MDRC's earlier career academies study suggests that exposure to work-related experiences during high school was likely a main contributing factor to the positive impacts on labor market outcomes in that study.³⁵

The students in this study experienced school closures during high school due to the COVID-19 pandemic, which drastically affected their ability to participate in in-person work-based learning activities. Most of them were in tenth or eleventh grade in March 2020, when the closures began. All the students experienced school closures, and many of their work-based learning activities were curtailed or canceled. Among those who answered this survey item, most CPA group students who had planned to participate in work-based learning opportunities reported that those experiences were canceled or they chose not to participate, and many others re-

35 Page (2012b).

ported that their opportunities had been changed or postponed (see Appendix Table A.9 for more details). Students who were expected to graduate in the spring of 2021 or 2022 faced the most cancellations of work-based learning since their later years of high school, when many work-based learning activities take place, were affected by closures, but even as schools went back to being in person, it took time for CPAs to rebuild their work-based learning activities and for employers to begin to allow students back in their offices and other workplaces. These findings suggest that work-based learning experiences for students participating in CPAs during the study period were likely much less numerous than they would have been if the pandemic had not happened. Unfortunately, the lack of work-based learning opportunities may influence the future employment impacts to be reported in later studies.

CPA group students reported that they experienced more college and career learning opportunities during their time in high school compared with their non-CPA group counterparts. In terms of college learning opportunities, as shown in Figure 2, CPA students were more likely to have gone on three or more college visits compared with their non-CPA counterparts. They were also more likely to have listened to three or more college-related guest speakers and more likely to have experienced three or more meetings with college representatives (see Appendix Table A.8 for more details). As for career learning experiences, as shown in Figure 2, CPA students were also more likely to report attending three or more talks by professional guest speakers and to visit three or more local employers. They were also more likely to participate in career fairs or meetings with employers (see Appendix Table A.8 for more details). As with the other findings, while CPA students had more of these experiences, some non-CPA students did participate in these types of activities as well.

Overall, the findings in this section suggest that there was a substantial contrast of received services between CPA and non-CPA students in the study. CPA group students reported experiencing more activities related to each of the key CPA components (school within a school, integration of academic and CTE coursework, and work-based learning opportunities). This is a promising result, especially given the impact of the COVID-19 pandemic on implementation. That said, these findings also show that non-CPA students were also participating in a considerable number of activities related to each of the key components of the CPA model. While some of this may be due to some non-CPA students crossing over to participate in a CPA, this did not happen often enough to reflect these findings, and it suggests that the schools in this study were likely providing students with other avenues for these types of experiences. The findings also reveal the influence of the pandemic—which left many CPA students unable to participate in planned work-based learning opportunities—on the experiences of those participating in this study.

Early or Mediating Outcomes

Survey items also asked students about the early outcomes listed in Figure 1. These early outcomes are mediators, or mechanisms, such as having personalized relationships with teachers or collaborating with peers, which are theorized to lead to the target outcomes of high school graduation and college readiness. This section discusses related survey findings.

It is hypothesized that the school-within-a-school approach and the integration of academic and career technical education would lead to students receiving more personalized attention from teachers, given the inclusion of a dedicated team of teachers who work with the same group of students and meet regularly to plan lessons and discuss individual student needs. As shown in Figure 3, among those who responded to these survey items, CPA group students were more likely to report (by about 8 percentage points) that they received personalized attention from most of or all their teachers, compared with their non-CPA counterparts. This finding aligns with MDRC's earlier study of career academies, where students were almost 9 percentage points more likely than their non-academy counterparts to report that they received personalized attention from most of or all their teachers.³⁶ Compared with their non-CPA group counterparts, CPA students were also more likely to agree or strongly agree that they had at least one adult mentor at school who can help them with school-related problems. Most CPA students, 88 percent, reported agreeing or strongly agreeing with this statement. While most students agreed or strongly agreed that they have at least one adult mentor who they trust to support them with personal issues (83 percent of CPA group students), the program did not have an effect on this measure, with CPA group and non-CPA group students reporting similarly (see Appendix Table A.10 for more detail).

The school-within-a-school approach and the integration of academic and career technical education are meant to lead to higher teacher expectations, given the focus on rigorous college preparatory courses and a dedicated team of teachers. Figure 3 shows that CPA group students were not more likely to report that most of or all their teachers had high expectations of them, with only 46 percent reporting that teachers had high expectations of them. In MDRC's earlier study of career academies, academy students were more likely than their non-academy counterparts to report that teachers had high expectations of students, with 72 percent giving a high rating to an overall measure of teacher expectations.³⁷

It was further hypothesized that the CPA components would lead to more collaboration among students, given the project-based learning and time spent together in multiple courses over multiple years. As shown in Figure 3, CPA group students were more likely to report that their classmates help each other and rely on each other to get through difficult assignments than non-CPA group students. The difference was almost 23 percentage points. In the earlier MDRC study, academy students were also more likely to report that they collaborated with their peers compared with their nonacademy counterparts (by 5 percentage points).³⁸

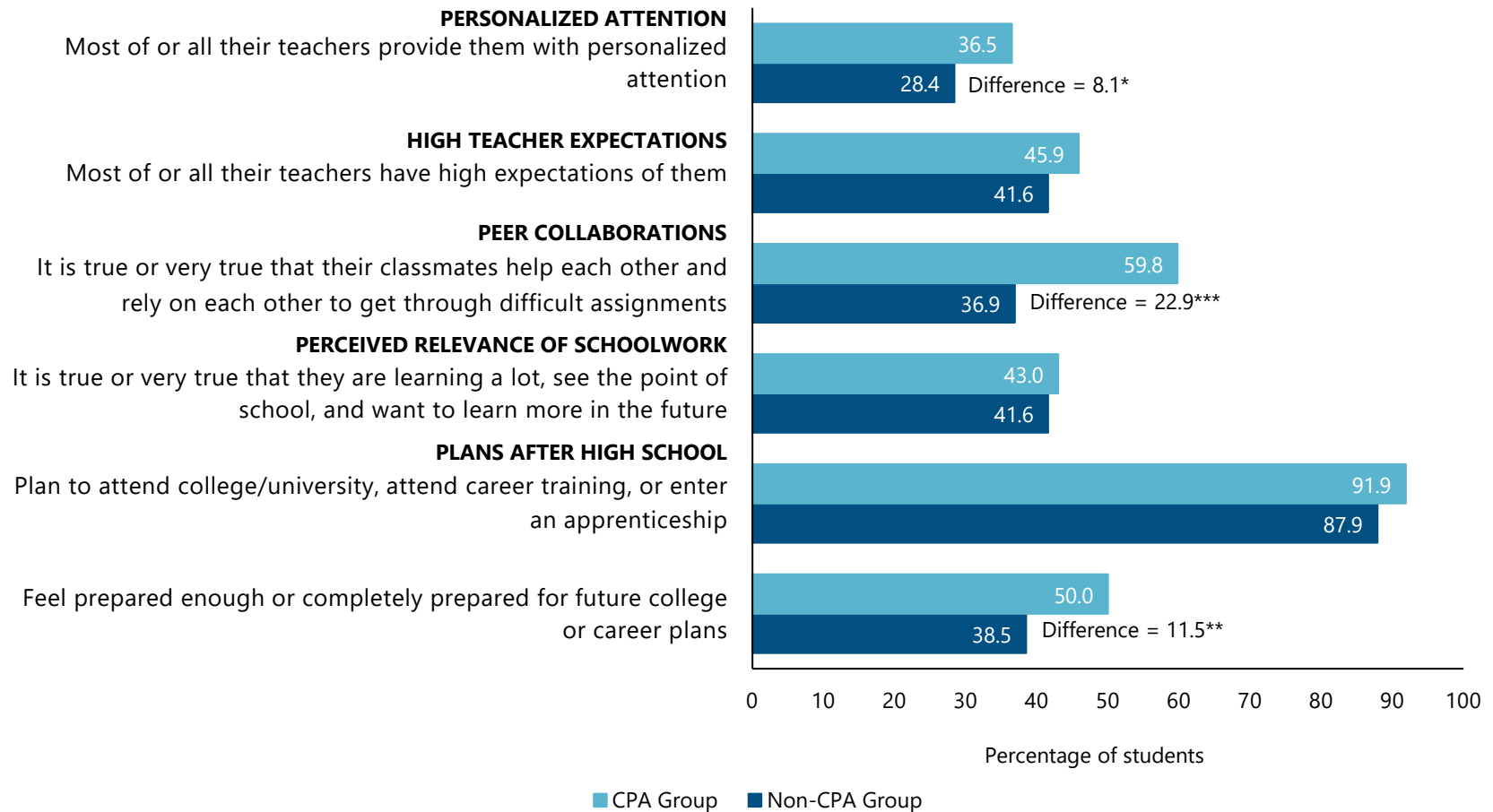
The integration of academic and career technical education and the employer partnerships and work-based learning activities are also meant to lead to students having a higher perceived relevance of their schoolwork, given the connection made between core academic learning and future careers, and to students being better prepared for and having stronger plans for postsecondary endeavors, given their opportunities to learn about college and career options

36 Kemple (1997).

37 Kemple (1997).

38 Kemple (1997).

FIGURE 3. Students’ Reporting on Early or Mediating Outcomes of California Partnership Academies



SOURCE: MDRC calculations from a survey of study participants during their senior year of high school.

NOTES: Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

during high school. As shown in Figure 3, CPA group students did not report a higher perceived relevance of their schoolwork than non-CPA group students, and the percentage of students reporting a high rating on the relevance of school work was low, with only 43 percent of students in CPAs saying it was true or very true that they feel they are learning a lot, see the point of school, and want to learn more in the future. In MDRC's earlier study, career academy students were more likely to give a high rating to their perception of the relevance of schoolwork than their non-academy peers (by 7 percentage points), and 70 percent of career academy students gave this measure a high rating.³⁹

Both CPA and non-CPA group students reported similar plans after high school, with almost all students across both groups planning to attend a four-year or two-year college after high school and many reporting also planning to work a part-time job (see Appendix Table A.10). As shown in Figure 3, CPA group students were not more likely than their non-CPA counterparts to report plans to participate in college, career training, or an apprenticeship, but CPA group students were more likely to report feeling prepared enough or completely prepared for future college or career plans (a difference of 12 percentage points).

In sum, CPA students reported some stronger effects than their non-CPA counterparts on personalized attention from teachers, peer collaboration, and feeling prepared for their future college or career plans. That said, differences were not found in students' reported perceptions of their teachers' expectations of them, their perceptions of the relevance of their schoolwork, or their college or career plans after high school. The lack of difference in these responses may be connected to the similar experiences of some non-CPA and CPA students for key program components. The fact that there were more consistent differences between academy and non-academy students in MDRC's earlier study on a similar set of measures may be in part because students not in the career academies back in the 1990s were not receiving similar types of educational interventions. Still, in this current study, students' ratings of their teachers' expectations of them and of their perceptions of the relevance of their schoolwork were low for both groups, with fewer than half of students rating these measures highly. This is much lower than ratings given on these measures by career academy students and their counterparts in the earlier study. It is possible some of the difference is due to the COVID-19 pandemic as schools closed and pivoted to online learning environments where students may have felt more disconnected from their teachers and less able to make connections between schoolwork and other facets of their lives than would have been the case during in-person school.

IMPACT FINDINGS

This section looks at the impacts of the CPA model on students' high school graduation, college readiness, and initial enrollment in college. The data for these outcome measures come from the CDE database of all K-12 public school students, which is called the California Longitudinal

39 Kemple (1997).

Pupil Achievement Data System. The study looks at on-time (within four years) graduation from a public high school in California.⁴⁰ It also looks at whether students graduated high school ready for college, with meeting the University of California and California State University course requirements referred to as “A-G course requirements” used as a proxy for college readiness.⁴¹ The sample for the analysis of high school graduation and career readiness outcomes includes all students from the full study sample of 1,125 students, with the exception of one cohort at one school where students had not yet graduated at the time of data collection (they were expected to graduate in the spring of 2024).⁴²

This section also includes a look at postsecondary enrollment during the first year after high school graduation.⁴³ This analysis required following students for an additional year, for a total of five years after they started high school. In addition to the cohort of students mentioned previously who had not yet graduated high school when data were collected, postsecondary records were not yet available for those students who graduated in the spring of 2023.⁴⁴

Impacts on High School Graduation, College Readiness, and College Enrollment

The study looks at on-time (within four years of the start of high school) graduation from a public high school in California. Almost all students in the study (both CPA and non-CPA group students) graduated on time. Ninety-three percent of students in both groups graduated within four years after starting high school, which is higher than the average rate across the state of California (86 percent in 2023), suggesting that while many in the study were identified as “at promise,” or at risk, of not graduating high school at the time of their entrance into the program, these students tended to be highly motivated and supported to graduate high school

40 Five-year graduation findings are included in the appendix.

41 The University of California and the California State University systems have established a uniform minimum set of courses required for admission as a freshman. To meet minimum admission requirements, students must complete 15 yearlong high school courses approved by the universities with a letter grade of “C” or better. These include courses in English, mathematics, social science, science, and world languages, as well as visual and performing arts and other electives. See California Department of Education (2024b) for more information.

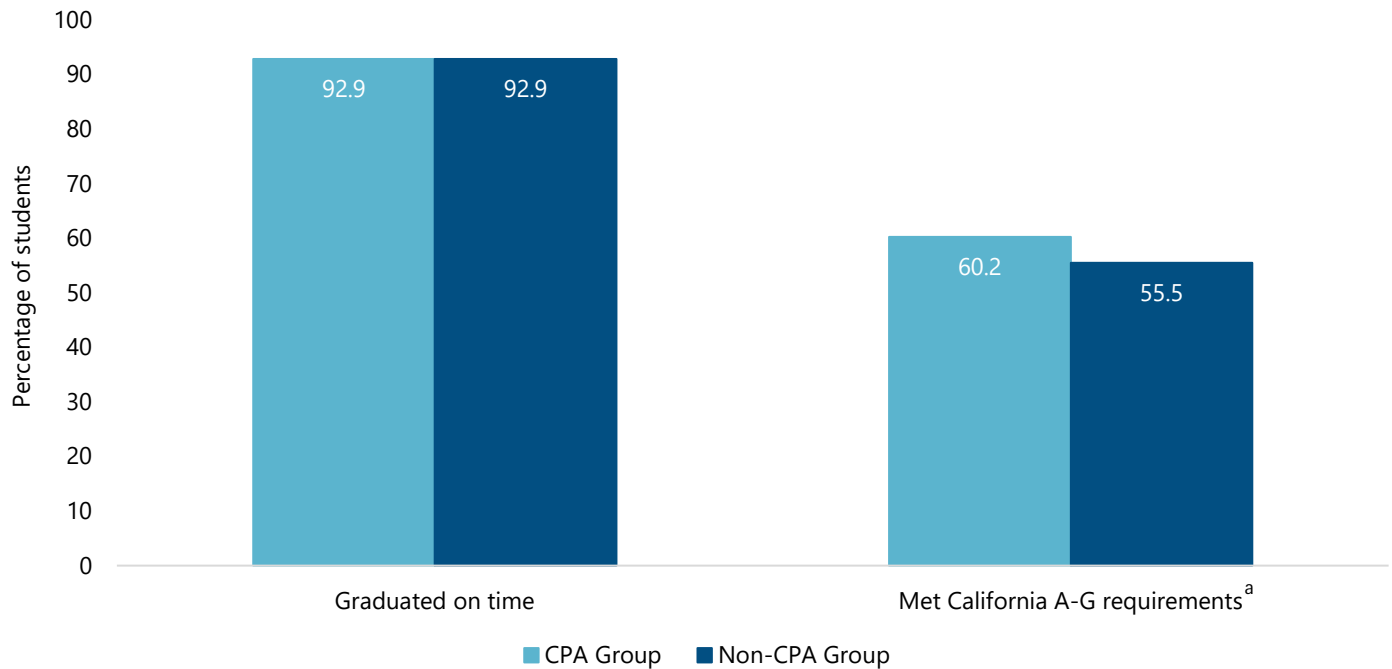
42 This cohort includes 36 students, and the total sample for these analyses is 1,089 students, or 97 percent of the full sample. Similar to the full sample shown in Table 1, the baseline comparison for this sample of students shows that the CPA group and non-CPA group were very similar prior to the start of the study (see Appendix Table A.2). Data from all 1,089 students were collected, and there were no missing outcomes data from the administrative records.

43 The California Department of Education collects National Student Clearinghouse data, which provides college enrollment data for more than 3,500 colleges and universities that enroll over 97 percent of all students in public and private U.S. institutions, for all former students (see National Student Clearinghouse, 2024).

44 The total sample for the analysis of postsecondary outcomes is 961 students. As with the full sample and the sample after four years, the CPA and non-CPA group students in this sample five years after random assignment were very similar on baseline characteristics (see Appendix Table A.3).

regardless of their CPA status.⁴⁵ As can be seen in Figure 4, there was no impact found on high school graduation.⁴⁶

FIGURE 4. Impacts of California Partnership Academies on On-Time High School Graduation and College Readiness, All Students



SOURCE: California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A two-tailed t-test was applied to each estimated impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

^aThe University of California and the California State University systems have established a uniform minimum set of courses required for admission as a freshman called A-G requirements. To meet minimum admission requirements, students must complete 15 yearlong high school courses approved by the universities with a letter grade of "C" or better. These include courses in English, mathematics, social science, science, and world languages, as well as visual and performing arts and other electives.

The study team also explored whether students graduated high school ready for college. To do this, researchers measured whether students met the University of California and California State University A-G course requirements. As shown in Figure 4, 60 percent of all CPA group students and 56 percent of all non-CPA group students met those requirements. The rate of college readiness for high school graduates across the state of California was 50 percent in 2023.⁴⁷ Similar

45 California Department of Education (2023).

46 This was still true one year after scheduled high school graduation. See Appendix Table A.11 for detailed findings on high school graduation four and five years after starting high school.

47 California Department of Education (2023).

to what we see with graduation rate, the students in this study are above average, especially as the study percentages are inclusive of all students regardless of graduation status, with the state percentage only including high school graduates. While there is a slightly higher percentage of CPA group students meeting A-G requirements compared with non-CPA group students, this measure is not statistically significant, and so the study cannot confirm that there is any impact of the CPA model on meeting A-G course requirements across all students.⁴⁸

While the next report will include a full analysis of impacts on college outcomes, the study team was able to collect college enrollment data during the first year after expected high school graduation from the CDE, and this report provides a first look at enrollment in colleges and universities. For the full sample of students for whom postsecondary enrollment data were available, the study did not detect an impact on postsecondary enrollment. While the percentage of CPA group students who enrolled in a four-year college is higher than the percentage of non-CPA group students, as shown in Figure 5, this difference is not statistically significant. It is worth noting that most students in this study were entering postsecondary education at the height of the COVID-19 pandemic or soon after, when college enrollments went down across the country, only beginning to recover in 2023.⁴⁹ (See Appendix Table A.11 for the detailed results of all the analyses for the full sample of students.)

Overall, no impacts were found on high school graduation, college readiness, or postsecondary enrollment for the full sample of students. These findings correspond to those seen in MDRC's earlier study of career academies, which found no impacts on high school graduation or college enrollment or success but did find impacts on employment outcomes after high school.⁵⁰

Impacts by Subgroups

The study team also looked at impacts on different groups of students by gender and by their level of academic and economic disadvantage. This section discusses the findings from these analyses. A limitation of these analyses is that the samples for the subgroups are small, approximately half the number of students in the full sample. As a result, the study may only be able to detect large subgroup impacts reliably.

Impact Findings by Gender

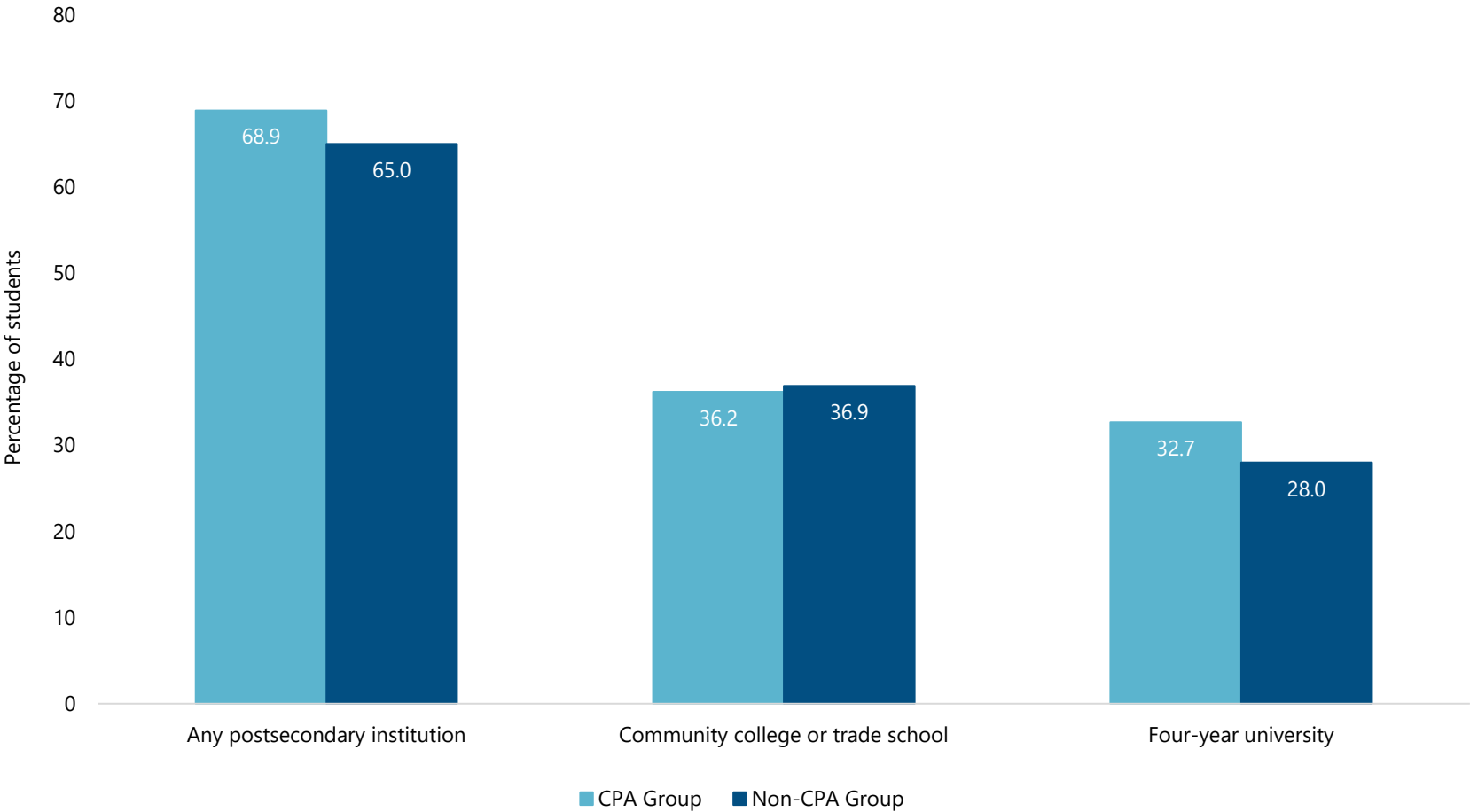
The study looks at impacts on high school graduation for young men and young women separately because the previous MDRC study of career academies found especially strong impacts on employment and wages for young men but not young women, although the earlier study did not find impacts on high school graduation or postsecondary degree attainment for either

48 The study team ran a LATE analysis to understand if comparing students who did and did not participate in CPAs had similar outcomes to comparing those who were offered and not offered a CPA spot. The findings were similar (see Appendix Table A.15).

49 National Student Clearinghouse Research Center (2023).

50 Kemple (2001, 2004, 2008).

FIGURE 5. Impacts of California Partnership Academies on Enrollment in Postsecondary Institutions One Year After Expected High School Graduation, All Students



SOURCE: California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A two-tailed t-test was applied to each estimated impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

young men or young women.⁵¹ Other recent studies of CTE have found impacts for young men. For instance, a study of the P-TECH model discussed earlier found impacts for young men on associate degree attainment while not finding impacts for young women on this or any measure of college success.⁵²

In this study, there were no effects found on four-year high school graduation for young men or women. Similar to what was found for the full sample, both young men and young women had high graduation rates of over 90 percent for both the CPA and non-CPA groups (see Appendix Table A.12).

As shown in Figure 6, young women who were in the CPA group were much more likely to graduate from high school meeting the course requirements to attend a public four-year university in the state of California than young women not in the CPA group. The impact on this college readiness measure for young women was 12 percentage points. This was not the case for young men, where the estimated impact was negative and the finding is not statistically significant, so it cannot be concluded that the actual impact is different from zero. There is a statistically significant difference between young men and young women, confirming an impact of the program specifically on young women and not young men. The strong impact on women, in this case, deviates from MDRC's earlier career academies study and the P-TECH study, which both found some impact on young men (albeit for different measures). Still, it is important to note that in California and across the country, young women have surpassed young men on college readiness and college completion.⁵³

To better understand these somewhat perplexing findings, the study team compared the baseline characteristics between all male and all female students as well as between non-CPA group male and female students. The findings from these analyses confirmed that the young men and young women participating in the study were different at baseline. A much larger percentage of young men did not meet standards on the English Language Arts state standardized test and when looking particularly at non-CPA students, young men were much less likely to meet standards on both math and ELA state assessments at baseline. The differences in the impacts on young men and women may be related to the fact that these groups of students entered the program at different levels of academic disadvantage.

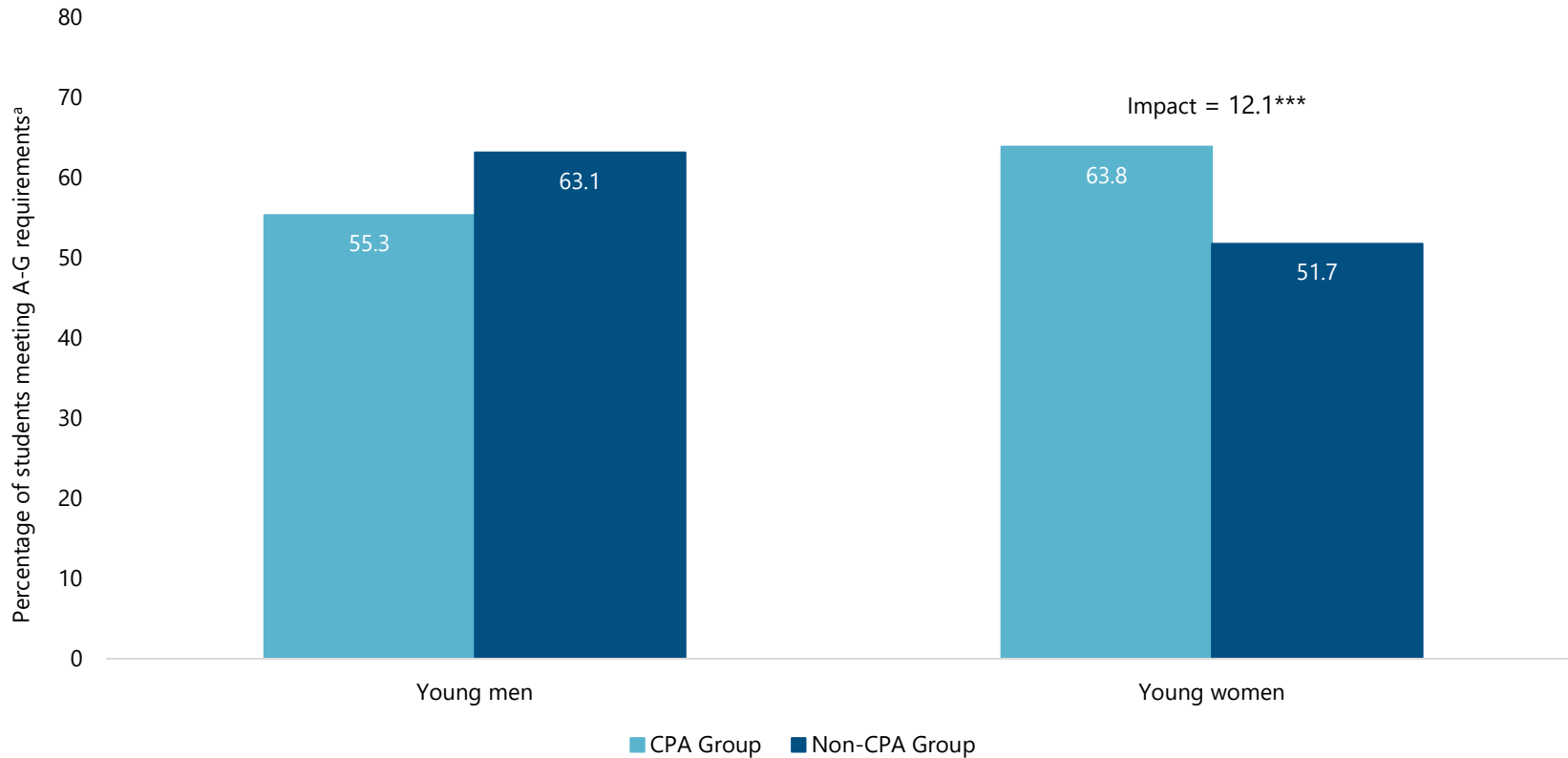
The study team also explored the differences between the effects of the program on high school experiences and early outcomes for the young men and young women participating in this study as measured on the survey. Participation in a CPA tended to have a stronger effect on young women's high school experiences compared with young men, including on taking most of their classes with the same students and teachers, taking at least one CTE class, and participating in college and career learning opportunities. Young women also reported a bigger effect of the program on collaboration with their classmates, but young men reported a bigger effect on their teachers' expectations of them. One reason for the strong positive impact on young women's

51 Kemple (2008).

52 Rosen et al. (2023).

53 Johnson (2016).

FIGURE 6. Impacts of California Partnership Academies on College Readiness, by Gender



SOURCE: California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A two-tailed t-test was applied to each estimated impact.

Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

The difference in impacts is statistically significant at the 1 percent level.

^aThe University of California and the California State University systems have established a uniform minimum set of courses required for admission as a freshman called "A-G requirements." To meet minimum admission requirements, students must complete 15 yearlong high school courses approved by the universities with a letter grade of "C" or better. These include courses in English, mathematics, social science, science, and world languages, as well as visual and performing arts and other electives.

college readiness may be that CPA participation generally had a stronger effect on their high school experiences related to the program. The young women participants may have gotten more out of the CPA program, on average, compared with the young men.

Further, it seems that while young men in the CPA group reported taking more CTE courses than young men in the non-CPA group, young men in the non-CPA group took more classes for college credit than their counterparts in the CPA group. This suggests that for the young men in the study, participating in the CPA may have focused them more toward CTE and less toward dual enrollment and other coursework offering college credit.

It is also worth noting that there are major differences in the types of CPAs women and men participated in based on industry sector. Men were more likely to participate in CPAs focused on engineering and architecture; arts, media, and entertainment (most of these CPAs were based in art and design using technology); information and communication technologies; and business and finance. Young women were more likely to participate in CPAs focused on health and medical fields and education. The study is unable to statistically detect specific differences in the impacts by industry sector given the number of different industry sectors represented, but the differences between young men and women on choices of industry sector suggest that men and women may be attracted to CPAs for different reasons, and it is possible that this is fueling some of the differences in effects. As can be seen in Figure 6, among students not invited to participate in a CPA, young men were more likely to meet the course requirements to enroll in a public university than young women, whereas the opposite pattern is observed among students invited to be in a CPA. This suggests that the CPA seems to have best supported the young women who were less likely to meet A-G course requirements without the CPA. One speculation is that young women are more likely to participate in CPAs to support their college readiness and college going, while young men are more likely to participate in CPAs to focus on the career aspects of the CPA, but it is not possible to tease out that hypothesis in this study.

While young women in the CPA group had a higher rate of enrollment in four-year colleges and universities than young women in the non-CPA group, this finding was not statistically significant, and so it cannot be concluded that participating in a CPA affected enrollment in a four-year institution for young women. Further, no difference was detected between young men and women on the impact CPAs had on their college enrollment during the first year after high school graduation. (See Appendix Table A.12 for full details on the differences in impacts between young men and women.)

Impact Findings by Level of Disadvantage

The study compares impacts for students who were both economically and academically disadvantaged at the start of the study to impacts for students who did not meet one or both of these criteria.⁵⁴ The study utilized the California Department of Education's measure of socio-

54 The study team could not access all the data points included in the California Department of Education's designation of students who are "at promise," or at risk, of not graduating high school as they enter a CPA. (As discussed earlier, CPAs are required to fill 50 percent of the spots in their academy with these students.)

economic disadvantage.⁵⁵ Students considered academically disadvantaged were those who did not meet standards on either or both the math and ELA eighth-grade Smarter Balanced standardized assessments.⁵⁶

Students who were identified as economically and academically disadvantaged at the beginning of their participation in the study and those who did not meet both these criteria for disadvantage graduated high school at similarly high rates. The CPA model did not affect graduation rates for either of these groups (see Appendix Table A.13).

However, as shown in Figure 7, students who were economically and academically disadvantaged were much less likely to graduate high school meeting the course requirements to attend a public four-year state university than their peers that did not meet both these criteria. Further, the CPA model had a large impact on this measure of college readiness for the economically and academically disadvantaged group of students. These CPA group students were over 13 percentage points more likely to meet the course requirements for attending a public university than their non-CPA group counterparts.⁵⁷ This is a particularly important finding because the CPA program is meant to support students who are at higher risk of not graduating high school by engaging them in career-themed college-preparatory academics. The state requires schools to hold 50 percent of the spots for students who are struggling, and this finding suggests that the program is particularly beneficial for these students in that it better prepares them for college. The program did not have an impact on college readiness for those students who did not meet both criteria for disadvantage.

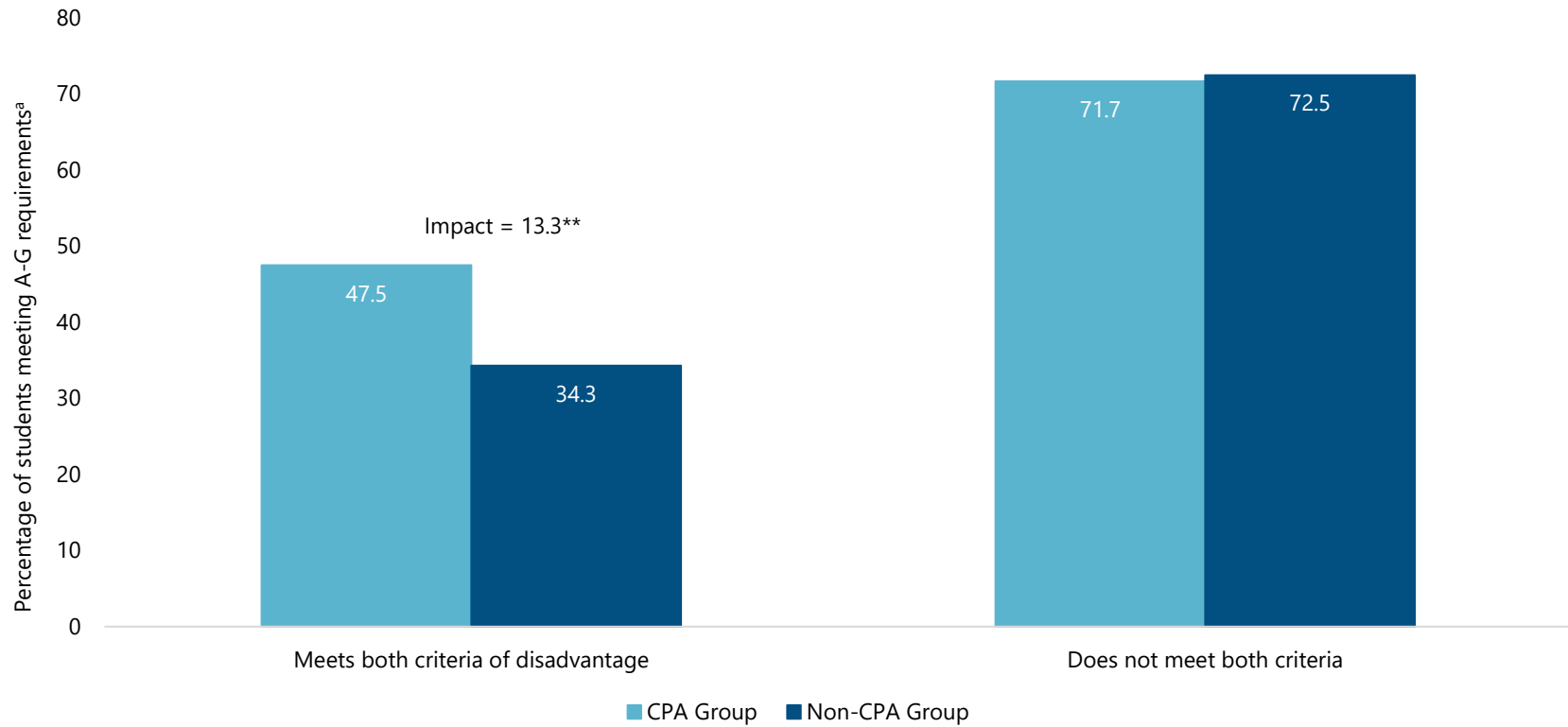
While there was an impact of the CPA model found on four-year university enrollment for students identified as economically and academically disadvantaged (of 9 percentage points), there was no difference in impacts found on this measure between the students who met both criteria of disadvantage and those who did not. Given this, it cannot be determined if the impacts for the two groups are truly different (see Appendix Table A.13).

55 Students identified as socioeconomically disadvantaged include students eligible for programs based on income (Free and Reduced-Price Meal programs, Title 1 Part C migrant program), students considered homeless, students in foster programs, students in juvenile court school, and students for whom neither of their parents have received a high school diploma. See California Longitudinal Pupil Achievement Data System (n.d.).

56 The Smarter Balanced assessment system includes four levels: level 4 (standard exceeded), level 3 (standard met), level 2 (standard nearly met), and level 1 (standard not met). The students met this criterion of disadvantage if their score fell within level 1 or 2. See Smarter Balanced (2022) and California Assessment of Student Performance and Progress (2024).

57 The study team looked at the effects on economically disadvantaged and academically disadvantaged students separately. Note that these groups are not mutually exclusive. An impact of 10.8 percentage points was found for the economically disadvantaged group. For the academically disadvantaged group, the difference between the CPA and non-CPA group students was 6.9 percentage points and was not statistically significant.

FIGURE 7. Impacts of California Partnership Academies on College Readiness, by Level of Disadvantage



SOURCE: California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A two-tailed t-test was applied to each estimated impact.

Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

The difference in impacts is statistically significant at the 5 percent level.

^aThe University of California and the California State University systems have established a uniform minimum set of courses required for admission as a freshman called "A-G requirements." To meet minimum admission requirements, students must complete 15 yearlong high school courses approved by the universities with a letter grade of "C" or better. These include courses in English, mathematics, social science, science, and world languages, as well as visual and performing arts and other electives.

While there were no impacts found on any of the measures for the full sample of students, the subgroup findings suggest that some students may have benefited more from the program than others, at least in terms of their preparedness for college at the end of high school. The CPA model had an impact on young women and on students identified as both economically and academically disadvantaged, supporting them to be more likely to meet the A-G course requirements for enrollment in a California public university. The CPA model did not have this kind of impact on young men and less disadvantaged students.

CONCLUSION

The research team faced some challenges in executing the study from the start. Given the high concentration of career academies and career pathways in the state of California, it was hard to find schools that would allow the study to assess the distinct effects of the core CPA principles over and above other high school opportunities. Many schools had moved to providing wall-to-wall academies, where all students at the school participate in a career-themed academy, while others provided enough opportunities to participate that all students who wanted to could. Further, many school districts promoted career academies and pathways across all their high schools. Even in schools where only one or two CPAs existed, some of the components of career academies (including small learning communities, CTE, and work-based learning opportunities) have become more ubiquitous, and so it is harder to find a true counterfactual comparison group than it was during the 1990s, when MDRC's earlier career academies study was implemented. Current educational reform in California has led to a saturation of career-themed interventions.

Ultimately, however, the study team was able to identify schools in which students selected for the CPA programs were much more likely to experience each of the key CPA components (school within a school, integration of academic and career technical education, and employer partners and work-based learning opportunities) compared with those who applied but were not selected. At the same time, varying proportions of the non-CPA group reported experiencing activities that were similar to those facilitated by the key program components.

A further issue for this study was the COVID-19 pandemic, which hit in the middle of the study period, leading to major school and business closures and causing many CPA students to miss internships and other work-based learning opportunities. While there are differences in the experiences of CPA and non-CPA group students, it is important to keep in mind that the CPA experiences were not typical given the pandemic-related cancellations of so many planned activities. The loss of these activities may dilute future research findings in this study, as exploratory analyses of the data from MDRC's earlier study of career academies suggest that work-based learning opportunities may be a key driver of the impact of career academies on employment and that participation in a career academy for a longer period (especially in the later years of

a program, when work-based learning opportunities are offered) leads to stronger effects on employment and earnings.⁵⁸

At the same time, it is possible that CPAs provided some unexpected benefits during the school closures. While the pandemic prevented the implementation of many originally planned work-based learning activities, the research team did hear some anecdotal accounts of CPAs making adjustments to develop online opportunities. For instance, some CPAs shifted focus to the offering of mentorship activities that gave students opportunities to connect virtually with professionals in their field. CPAs were also more likely to be small learning communities, and it's possible these communities were an asset for many students during school closures because they may have presented easier opportunities for online connection than are seen in traditional large high school environments.

Students' exposure to the CPA model improved a range of early mediating outcomes in ways that were hypothesized to lead to later impacts on student outcomes. CPA group students reported receiving more personalized attention, collaborating more with their peers, and feeling better prepared for future college or career plans than their non-CPA group counterparts. The model did not affect students' plans after high school, their perceptions that their teachers had high expectations of them, or their perceptions of the relevance of their schoolwork (and more than half of students reported that they did not believe most of their teachers had high expectations of them and that they did not feel they were learning a lot, see the point of school, or want to learn more in the future).

The program did not affect on-time high school graduation rates or initial college enrollment rates, positively or negatively. In fact, 93 percent of students in the study (across both the CPA and the non-CPA groups) graduated within four years, and 69 percent enrolled in some form of college the following year. These rates are higher than those for the state of California in recent years (86 percent of students graduated in 2023 across the state, and 62 percent of students that graduated high school during the 2021-2022 school year entered college in the year after high school).⁵⁹

While the study did not find a systematic impact on college readiness for the full sample of students, the CPA model did improve college readiness for young women and for students who were identified as economically and academically disadvantaged. The finding for students identified as disadvantaged is important given the state's priority to ensure that these students have access to the program. This finding suggests that these students do truly benefit from participation in the CPA model. It is likely that the rigorous college preparatory aspects are crucial for supporting these students in meeting course requirements for university entrance.

It will be important to explore in future reports whether the impacts on this measure of college readiness for young women and pupils identified as disadvantaged lead to stronger college

58 Page (2012a, 2012b).

59 California Department of Education (2023, n.d.-b).

completion and labor market outcomes. Positive labor market outcomes in MDRC's earlier career academies study were concentrated among the academy students who were at higher risk of dropping out of high school.⁶⁰ It is also important to note that young women seem to benefit more from the CPA program than young men in terms of college readiness. In the previous study, it was young men who benefited most, at least in terms of labor market outcomes, which will be measured in later reports and may or may not be correlated with college readiness.

This first report offers a picture of the differences in high school experiences for CPA and non-CPA group students, explores the impact of the program on high school graduation and college readiness, and provides an early look at college and university enrollment. Future reports will examine the impacts of the program on postsecondary enrollment and success as well as labor market outcomes, including employment and wages.

60 Kemple (2008).

APPENDIX

Technical Appendix

ANALYTIC SAMPLES INCLUDED IN THE IMPACT ANALYSES

The full study sample includes 1,125 students. These students were recruited to participate in the study over three years, and students entered the program during three school years (2018-2019, 2019-2020, and 2020-21), with most students recruited during the first and second years. Some of the CPAs ran for three years (tenth through twelfth grade), while others ran for four years (ninth through twelfth grade). As shown in Table A.1, students' expected high school graduation year depends on the year they entered the CPA as well as whether they were in ninth or tenth grade during that year (that is, whether the CPA program was three or four years in length). There are four years when sample students were expected to graduate high school (2020-2021 through 2023-2024).

Given the timing of this report and the data collection required for it, the impact analyses are missing a small number of students. For measures of high school graduation and college readiness, the study focuses on graduation at the end of students' fourth year of high school. There was one cohort of students at one school (sample size = 36) who had not yet finished their fourth year of high school at the time of data collection. For this reason, these students are not included in the CPA impact analyses on high school graduation and college readiness. As shown in Table A.1, with those students removed, the sample includes 1,089 students.

The impact analysis also includes a look at postsecondary enrollment during the first year after high school graduation. This analysis required following students for an additional year, for a total of five years after they started high school. In addition to the cohort of students mentioned above who had not yet graduated high school when data was collected, postsecondary records were not yet available for those students who graduated in the spring of 2023. As shown in Table A.1, the sample for impacts measured five years after the start of high school graduation includes 961 students.¹ In future reports, the full study sample of students will be included when data are available.

Tables A.2 and A.3 compare baseline characteristics between CPA and non-CPA groups for students in the four-year and five-year analytical samples, separately. Findings from both tables indicate that students in the CPA group are similar on average to those in the non-CPA group in terms of measurable baseline characteristics (with the exception being a slight difference in special education status). Furthermore, omnibus likelihood ratio tests for joint baseline equivalence were not significant ($p = 0.601$ for the four-year sample, $p\text{-value} = 0.733$ for the five-year sample), providing confidence that both samples are balanced at baseline.²

1 This appendix also includes analyses of high school graduation and college readiness five years after the start of high school to capture those students who graduated the year after their expected graduation. These analyses were conducted on this sample of 961 students.

2 To test for joint significance of all baseline characteristics, two logistic regression models are fitted. The "null" model regresses the random assignment indicator on the intercept and random assignment block indicators. The "full" model adds to the null model all the baseline characteristics. A likelihood ratio (omnibus)

SURVEY RESPONSE BIAS ANALYSIS

The student survey was fielded to students during their senior year of high school in the spring of 2021, 2022, and 2023, during which time a total of 813 students participated, 72 percent of the full sample of 1,125 students.³ A higher proportion of CPA group students responded to the survey (75 percent) compared with non-CPA group students (64 percent).⁴

Two sensitivity checks were performed to examine the influence of non-response on the internal and external validity of the findings. First, baseline characteristics of survey respondents in the CPA group were compared with characteristics for survey respondents in the non-CPA group, providing an indication of whether the results are internally valid for survey respondents. Table A.4 shows that the two groups were generally similar on most selected baseline characteristics. An omnibus likelihood ratio test was conducted to determine whether survey respondents' baseline characteristics were jointly predictive of students' research group assignment. The results were not statistically significant ($p = 0.489$), indicating little evidence that the groups of respondents were systematically different on observable baseline characteristics at the outset of the study.⁵

Second, the baseline characteristics of survey respondents were compared with the characteristics of students who did not respond to the survey, which provides an indication of how representative the survey respondents are of the full study sample and whether the findings are externally valid. As shown in Table A.5, respondents and non-respondents were not similar on about half the selected baseline characteristics. An omnibus likelihood ratio test conducted to determine whether students' baseline characteristics were jointly predictive of responding to the survey yielded a p -value of less than 0.001, suggesting that respondents and non-respondents differ in their baseline characteristics.⁶ These findings suggest that the survey respondents are different from their non-respondent counterparts, and thus survey results may not generalize to non-respondents. This is not surprising because we would expect that the group of students who are still at the schools and willing to respond to the survey would be different, on average, than the group of students who have dropped out or left the schools, who are not easily located (that is, may be often absent or missing from classes), or who were unwilling to participate in the survey.

test is conducted to compare the two models and evaluate if the addition of all baseline characteristics improves the model's ability to predict the random assignment group.

3 A student is counted as participating in the survey if the student completed more than 50 percent of the survey. Most respondents completed 100 percent of the survey. Only four respondents completed more than 50 percent of the survey but less than 100 percent. There was one school where the survey was not administered and no students were surveyed.

4 The differential survey response rate between the research groups was 11 percentage points, and this was statistically significant ($p < 0.001$).

5 This test does not rule out the possibility that the two groups of survey respondents differ in unobserved ways.

6 This omnibus test follows a procedure similar to that described earlier, but a respondent indicator is used instead of the random assignment indicator. Effectively, this omnibus test evaluates if the addition of all baseline characteristics improves the model's ability to predict whether a student responds to the survey.

While Table A.5 shows there is balance between CPA and non-CPA group students in the full survey respondent sample, results on certain survey items should still be interpreted with some caution because of issues with non-response on specific survey measures. These are due in some cases to survey skip patterns but are also because students were able to choose whether to answer each item and some students skipped items. Survey measures that have 5 percent or greater missing values are flagged, and these results are generalized only to the subset of students who provided a valid response (see Tables A.6 through A.10).

INTENT-TO-TREAT MODEL SPECIFICATIONS

The primary estimates presented in this report are what are known as “intention-to-treat” (ITT) estimates; that is, each group is made up of students who were randomly assigned to either the CPA group (offered enrollment into a CPA) or non-CPA group (not offered enrollment into a CPA), regardless of whether they actually enrolled in a CPA. Findings from this kind of analysis are considered internally valid causal estimates because the groups are comparable. On average, the groups differ only in having been offered an academy seat or not, allowing researchers to determine whether the offer to enroll in a CPA caused any differences between the two research groups. ITT results are considered policy-relevant because they represent the best estimates of what can be expected to occur, on average, if an intervention is offered in a community since it is likely that not all students will take up the intervention offered.

The same ITT model was used for all survey-based and administrative outcomes described in the report. The primary equation is defined as follows:

Equation A.1:

$$Y_i = \sum_{j=1}^J \pi_j \cdot I_{ji} + \beta_o \cdot T_{ji} + \theta_c \cdot S_{ci} + \varepsilon_i \quad (1)$$

where:

Y_i = a survey-based high school or postsecondary outcome for student i

T_{ji} = a random assignment indicator equal to 1 if student i in random assignment block j is assigned to the CPA group and 0 otherwise⁷

7 There are a total of 25 lotteries or random assignment blocks for this study. For the impact analysis using administrative records, we drop one study block since data for high school graduation outcomes were not yet available for these students; at the time of data collection, these students are high school seniors. Thus, there are 24 random assignment blocks for the main impact analysis. Separately, for the survey analysis, one study block is dropped since MDRC was unable to administer the senior survey to these students. Consequently, there are also 24 random assignment blocks for the survey analysis.

I_{ji} = lottery fixed effects, which is a vector of dummy variables equal to 1 for each individual lottery (random assignment block) j and 0 otherwise⁸

S_{ci} = vector of covariates for each student characteristic c for student i measured at baseline. Student covariates include: baseline measures of math and English Language Arts eighth-grade California Smarter Balanced test scores, an indicator for socioeconomically disadvantaged status, an indicator for special education status, indicators for student race/ethnicity and gender, and indicators for students missing these baseline data (whose data on these covariates have been imputed)⁹

ε_i = random error term for student i

The estimated coefficient, β_{or} , is the regression-adjusted difference between mean outcomes for CPA and non-CPA group members. This result is the estimated effect of being offered enrollment into a CPA.¹⁰

COMPLETE HIGH SCHOOL EXPERIENCE FINDINGS

Figure 2 displays selected high school experience findings. Tables A.6, A.7, and A.8 display the complete findings from the service contrast analysis, which looks at the differences in students' reported high school experiences between CPA and non-CPA group students. Each table is based on a key component of the CPA model: school within a school, integration of academic and career technical education, and employer partners and work-based learning experiences. Many students in the CPA group were unable to participate in work-based learning experiences as originally planned due to the COVID-19 pandemic. Table A.9 displays the planned work-based learning experiences of CPA group students and what percentage of those experiences happened as planned, were changed or postponed, or were canceled or foregone by the student. These are broken down by expected graduation year since the pandemic was likely to affect work-based learning activities differently during different years.

8 Inclusion of fixed effects (dummy variables for each lottery or random assignment block) controls for unobserved heterogeneity that is constant within each block but may vary between blocks. This helps to reduce omitted variable bias and improves the precision of the estimates.

9 Most of the covariates include less than 2 percent missing data. However, eighth-grade Smarter Balanced math and English test scores are missing for more than 5 percent of the full study sample (6 percent and 7 percent, respectively). For missing baseline covariate data, the mean value is imputed, within the random assignment block, and a dummy variable is included in the regression model coded as 1 for every observation for which data are missing, and 0 otherwise.

10 Within the tables, the value of the estimated effect of being offered CPA enrollment is labeled as "Estimated Difference" for survey-based outcomes and "Estimated Impact" for administrative outcomes.

COMPLETE EARLY OR MEDIATING OUTCOMES FINDINGS

Figure 3 displays selected early outcomes findings that represent the actions and attitudes of students and adults at the schools that were hypothesized to lead to impacts on students' high school and postsecondary educational outcomes. Table A.10 provides the complete findings on these early outcomes, including personalized attention, teacher expectations, peer collaboration, perceived relevance of schoolwork, and plans after high school.

COMPLETE IMPACT FINDINGS

Figures 4 through 7 display selected impact findings on high school and postsecondary outcomes for the full analytical samples of students as well as subgroups of students. Table A.11 displays the complete impact findings for the analytical samples of students, Table A.12 displays the complete impact findings by gender, and Table A.13 displays the complete impact findings by level of disadvantage.

COMPLETE LATE FINDINGS

In addition to the ITT analysis, two-stage least squares (2SLS) instrumental variable (IV) analyses were conducted to estimate the Local Average Treatment Effects (LATE), which are the estimates of the average effects of the treatment (enrolling in a CPA) for the “compliers.” When estimating the LATE using instrumental variable analysis, there are three mutually exclusive, collectively exhaustive subgroups of study participants: always-takers, never-takers, and compliers.¹¹ The LATE estimate only generalizes to the compliers.¹² Treatment compliers are the subgroup of students who participate or enroll in a CPA because they were assigned to the CPA group.¹³ The instrumental variable used in the 2SLS model is a 0/1 indicator for the random assignment group. This instrument is valid because it is randomized and thus cannot be correlated with unexplained variation in student outcomes. In addition, the random assignment instrument is “strong” because being assigned to the CPA group is highly correlated with enrolling or not enrolling in a CPA.¹⁴ The resulting 2SLS model is as follows:

11 Angrist, Imbens, and Rubin (1996).

12 Note that the treatment on the treated (TOT), which is subtly different from the LATE, measures the average treatment effect for both always-takers and compliers.

13 Compliers in the comparison or non-CPA group are students who do not enroll in a CPA because they were assigned to the non-CPA group. To estimate the LATE, some assumptions are made, namely that (1) random assignment (the instrumental variable) only has an effect on enrolling in the CPA, and (2) the only way that being in the CPA group affects the outcome is if students actually enroll in the CPA. Thus, the average effects of the treatment for the non-CPA group compliers are zero since these students do not enroll and thus do not participate in the CPA.

14 The first-stage F-test for the random assignment instrumental variable resulted in an F statistic of >900 for the four-year analytical sample and an F statistic of >700 for the five-year analytical sample. This far exceeds the first-stage F statistic threshold for satisfying the criterion of sufficient instrument strength (greater or equal to 16.38) for a single instrument as recommended by Stock and Yogo (2005).

First-Stage Equation

Equation A.2:

$$E_i = \sum_{j=1}^J \pi_j \cdot I_{ji} + \gamma_1 \cdot T_{ji} + \theta_c \cdot S_{ci} + w_i \quad (2)$$

where:

E_i = an enrollment indicator equal to 1 if student i ever enrolled in a CPA, and 0 otherwise¹⁵

T_{ji} = a random assignment indicator equal to 1 if student i in random assignment block j is assigned to the CPA group and 0 otherwise. This is the instrumental variable.

I_{ji} = lottery fixed effects, which is a vector of dummy variables equal to 1 for each individual lottery (random assignment block) j and 0 otherwise

S_{ci} = vector of covariates for each student characteristic c for student i measured at baseline. Student covariates are defined in Equation A.1.

w_i = random error term for student i

The estimated value of γ_1 is the regression-adjusted difference in CPA take-up (enrollment) rates across treatment and comparison groups (also referred to as the “compliance rate”).

Second-Stage Equation

Equation A.3:

$$Y_i = \sum_{j=1}^J \alpha_j \cdot I_{ji} + \delta \cdot \hat{E}_i + \phi_c \cdot S_{ci} + \varepsilon_i \quad (3)$$

Y_i = a high school or postsecondary outcome for student i

\hat{E}_i = predicted probability of ever enrolling in a CPA from the first-stage equation

ε_i = random error term for student i

15 As discussed in the report, CPAs are multiyear academies, beginning in either a students’ ninth- or tenth-grade year. For this study, a student is flagged as having *ever enrolled in a CPA* if the student enrolled in a CPA at **any** point during high school.

All other terms are defined as in Equation A.2. The estimated value of δ is a consistent regression-adjusted estimate of the average effect of enrolling in a CPA for the compliers (the LATE).¹⁶

Table A.14 shows that overall compliance rates were high, crossover rates from the non-CPA group to the CPA group were low, and most students did comply with their intended research group assignment.¹⁷ Consequently, the ITT estimates (effects of the *offer* to enroll in a CPA) are roughly similar to the LATE estimates (effects of *enrolling* in a CPA for compliers) reported in Table A.15.

RANKED WAITLIST AND ESTIMATING THE INITIAL-OFFER IMPACT

Students were recruited and randomly assigned to the CPA or non-CPA groups within schools during the spring prior to their first year of the program. Throughout the recruitment period, the study team struggled to recruit enough CPAs and students to meet the sample goals. Given this, the study team wanted to include all recruited students in the study but knew that some individuals who were invited to enroll in a CPA would decline to participate, leave the school before they began participating, or drop out of the CPA early on. To ensure all the CPA seats were filled, the study needed to have a waitlist of students to fill empty seats. Rather than assign a subset of students to a non-study waitlist, the study team used the random numbers assigned to non-CPA students during the random assignment process to identify a small subset of the non-CPA group students and place them in a ranked waitlist (the students with the smallest numbers were included in this waitlist). These waitlisted students were invited to enroll in the CPA in the order specified based on their random number when a CPA student left the CPA before or during the first year of the program. As these waitlisted students were invited into the CPA, they were moved from the non-CPA group into the CPA group, regardless of whether they accepted the offer and enrolled. This allowed the team to maximize the sample of students in the study while maintaining the experimental design. This affected a total of 61 students.

However, a recent paper by Chaisemartin and Behaghel shows that with this type of waitlist, the students ever getting and not getting an offer to participate in an intervention may not be statistically comparable.¹⁸ As a sensitivity check, all students who were offered an academy seat off the waitlist were dropped (61 total students) and the students initially offered CPA enrollment were compared with students not offered CPA enrollment, effectively estimating the impact of the initial offer of CPA enrollment on student outcomes. The findings for this analysis can be

16 As a check, an approximation of the LATE is calculated using the standard Bloom adjustment method, where the ITT estimate is scaled by the compliance rate reported in Table A.14 (see Litwok and Peck, 2019). The Bloom-adjusted LATE approximations (unreported) were identical to the LATE estimates calculated using the 2SLS IV approach.




17 The compliance rate is the difference in the program take-up rate between the treatment (CPA) and comparison (non-CPA) groups. Multiplying the compliance rate with the CPA group sample size will generate an estimated count of CPA group compliers, which are the subgroup of students that the LATE generalizes to.

18 Chaisemartin and Behaghel (2019).

found in Table A.16. Additionally, an initial-offer sensitivity check was run for the LATE analysis, and the findings can be found in Table A.17. Initial-offer impacts are very similar to the impacts reported in the main analysis (Table A.11) and the LATE analysis (Table A.15), providing evidence that the randomized ranked waitlist did not introduce bias into the study findings.¹⁹

19 Chaisemartin and Behaghel (2019) recommend estimating a doubly reweighted ever offer (DREO) estimator in the context of randomized waitlists. To do so, an assumption made is that the treatment take-up rate is the same for the students originally invited into the program and those invited via the waitlist. In this study, students on the waitlist were less likely to enroll in the CPA when offered than the students originally invited into the CPA because during the lapse of time many students not originally offered a spot in a CPA moved on to other programs or lost interest in participating. Since this assumption is not met, the DREO was not estimated. Instead, the study team follows a secondary recommendation to estimate the initial-offer (IO) estimator.

APPENDIX TABLE A.1. Cohort, School Year Entered a California Partnership Academy, Expected Graduation Year, and Number of Schools and Students Included in Each Analytical Sample

Cohort	School Year Entered CPA	CPA Duration (years)	Expected Graduation School Year	Number of Schools/CPAs	Total Students	Full Study Sample (1,125 students)	Four-Year Sample (1,089 students)	Five-Year Sample (961 students)
1	2018-2019	3	2020-2021	8	440			
		4	2021-2022	3	270			
2	2019-2020	3	2021-2022	5	251			
		4	2022-2023	1	44			
3	2020-2021	3	2022-2023	1	84			
		4	2023-2024	1	36			

SOURCE: MDRC calculations use the California Department of Education (CDE) student data from the 2017-2018 through 2022-2023 school years.

APPENDIX TABLE A.2. Comparison of Baseline Characteristics for the Four-Year Analytical Sample

Characteristics	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Male (%)	42.1	40.2	1.9	0.581
Race/ethnicity ^a (%)				
Black, non-Hispanic	4.8	6.1	-1.3	0.434
White, non-Hispanic	19.6	19.5	0.1	0.981
Hispanic	52.6	52.2	0.4	0.884
Asian	17.5	18.3	-0.8	0.751
Other	5.5	3.9	1.6	0.344
Special education (%)	0.6	1.8	-1.2*	0.074
Absent for more than 10% of the school year (%)	4.9	4.7	0.2	0.922
Absent for more than 20% of the school year (%)	0.1	0.4	-0.3	0.384
Economically disadvantaged (%)	63.1	60.6	2.4	0.410
Not meeting standards on the state math assessment (%)	58.7	56.7	2.0	0.529
Not meeting standards on the state English Language Arts assessment (%)	43.8	49.4	-5.6	0.107
Economically and academically disadvantaged (%)	48.3	48.0	0.2	0.944
Sample size (total = 1,089)	854	235		

SOURCE: MDRC calculations use California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A likelihood ratio test was used to determine whether there is a systematic difference between the two groups with respect to the characteristics included in this table. The p-value for this test is not statistically significant (p-value = 0.601).

Estimated differences are regression-adjusted for the blocking of random assignment. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Attendance is measured the school year before a student would start a CPA. California Smarter Balanced English Language Arts and math test scores are measured in a student's eighth year. All other characteristics are measured the year the student joined the study.

Students are flagged as being economically and academically disadvantaged at baseline if they met the following state criteria: (1) a student is economically disadvantaged, and (2) a student nearly met or did not meet standards on either the mathematics or English Language Arts eighth-grade standardized tests.

Distributions may not add to 100 percent because of rounding.

Sample sizes may vary for some characteristics due to missing values. Only characteristics with more than 5 percent of the sample missing are noted.

^aStudents who said they are Hispanic and chose a race are included only in the Hispanic category. Students who chose American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, or more than one race are included in the Other category.

APPENDIX TABLE A.3. Comparison of Baseline Characteristics for the Five-Year Analytical Sample

Characteristics	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Male (%)	43.9	44.4	-0.4	0.909
Race/ethnicity ^a (%)				
Black, non-Hispanic	4.7	6.2	-1.5	0.407
White, non-Hispanic	17.5	17.8	-0.3	0.924
Hispanic	55.0	52.8	2.2	0.497
Asian	17.0	18.7	-1.7	0.542
Other	5.7	4.5	1.2	0.522
Special education (%)	0.7	2.1	-1.4*	0.071
Absent for more than 10% of the school year (%)	5.0	5.0	0.0	0.993
Absent for more than 20% of the school year (%)	0.1	0.5	-0.3	0.379
Economically disadvantaged (%)	64.5	62.2	2.3	0.458
Not meeting standards on the state math assessment (%)	59.9	58.2	1.8	0.605
Not meeting standards on the state English Language Arts assessment (%)	45.6	50.4	-4.8	0.199
Economically and academically disadvantaged (%)	49.1	50.7	-1.6	0.637
Sample size (total = 961)	759	202		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A likelihood ratio test was used to determine whether there is a systematic difference between the two groups, with respect to the characteristics included in this table. The p-value for this test is not statistically significant (p-value = 0.733).

Estimated differences are regression-adjusted for the blocking of random assignment. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Attendance is measured the school year before students joined the study (eighth or ninth grade). California Smarter Balanced English Language Arts and math test scores are measured in a student's eighth-grade year. All other characteristics are measured the year the student joined the study.

Students are flagged as being economically and academically disadvantaged at baseline if they met the following state criteria: (1) a student is economically disadvantaged, and (2) a student nearly met or did not meet standards on either the mathematics or English Language Arts eighth-grade standardized tests.

Distributions may not add to 100 percent because of rounding.

Sample sizes may vary for some characteristics due to missing values. Only characteristics with more than 5 percent of the sample missing are noted.

^aStudents who said they are Hispanic and chose a race are included only in the Hispanic category. Students who chose American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, or more than one race are included in the Other category.

APPENDIX TABLE A.4. Comparison of Baseline Characteristics for Survey Respondents

Characteristics	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Male (%)	39.7	37.4	2.3	0.585
Race/ethnicity ^a (%)				
Black, non-Hispanic	3.6	4.9	-1.3	0.481
White, non-Hispanic	21.4	22.5	-1.0	0.741
Hispanic	49.4	51.8	-2.4	0.489
Asian	19.9	19.0	0.9	0.773
Other	5.6	1.8	3.8*	0.059
Special education (%)	0.6	0.7	-0.1	0.867
Absent for more than 10% of the school year (%)	3.6	0.9	2.7*	0.091
Absent for more than 20% of the school year (%)	0.2	0.0	0.1	0.707
Economically disadvantaged (%)	59.7	58.7	1.1	0.761
Not meeting standards on the state math assessment ^b (%)	55.6	57.5	-1.9	0.613
Not meeting standards on the state English Language Arts assessment ^b (%)	40.2	46.7	-6.5	0.120
Economically and academically disadvantaged ^b (%)	45.8	48.9	-3.2	0.400
Sample size (total = 813)	659	154		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A likelihood ratio test was used to determine whether there is a systematic difference between the two groups, with respect to the characteristics included in this table. The p-value for this test is not statistically significant (p-value = 0.489).

Estimated differences are regression-adjusted for the blocking of random assignment. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in calculating differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Attendance is measured the school year before students joined the study (eighth or ninth grade). California Smarter Balanced English Language Arts and math test scores are measured in a student's eighth-grade year. All other characteristics are measured the year the student joined the study.

Students are flagged as being economically and academically disadvantaged at baseline if they met the following state criteria: (1) a student is economically disadvantaged, and (2) a student nearly met or did not meet standards on either the mathematics or English Language Arts eighth-grade standardized tests.

Distributions may not add to 100 percent because of rounding.

Sample sizes may vary for some characteristics due to missing values. Only characteristics with more than 5 percent of the sample missing are noted.

^aStudents who said they are Hispanic and chose a race are included only in the Hispanic category. Students who chose American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, or more than one race are included in the Other category.

^bAbout 7 percent of the study sample are missing data for this characteristic.

APPENDIX TABLE A.5. Comparison of Baseline Characteristics for Full Sample, Survey Respondents Versus Non-Respondents

Characteristics	Respondent	Non-Respondent	Estimated Difference	P-Value for Estimated Difference
Male (%)	38.7	41.0	-2.4	0.476
Race/ethnicity ^a				
Black, non-Hispanic	4.1	7.7	-3.6**	0.020
White, non-Hispanic	20.9	25.4	-4.5*	0.077
Hispanic	49.0	51.1	-2.1	0.479
Asian	20.9	10.9	10.1***	<0.001
Other	5.0	4.9	0.1	0.944
Special education (%)	0.6	1.3	-0.7	0.271
Absent for more than 10% of the school year (%)	3.1	10.2	-7.1***	<0.001
Absent for more than 20% of the school year (%)	0.1	0.5	-0.4	0.247
Economically disadvantaged (%)	60.1	62.5	-2.4	0.397
Not meeting standards on the state math assessment ^b (%)	54.9	63.9	-9.0***	0.003
Not meeting standards on the state English Language Arts assessment ^b (%)	40.5	53.5	-13.0***	<0.001
Economically and academically disadvantaged ^b (%)	45.5	52.3	-6.8**	0.022
Sample size (total = 1125)	813	312		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: A likelihood ratio test was used to determine whether there is a systematic difference between the two groups, with respect to the characteristics included in this table. The p-value from this test is statistically significant (p-value < 0.001).

Estimated differences are regression-adjusted for the blocking of random assignment. Values for the respondent group are simple means for all students who responded to the survey. The value for the non-respondent group equals the respondent group mean minus the estimated difference. Rounding may cause slight discrepancies in differences.

Two-tailed t-tests were used to assess differences between the respondent and the nonrespondent groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Attendance is measured the school year before students joined the study (eighth or ninth grade). California Smarter Balanced English Language Arts and math test scores are measured in a student's eighth grade year. All other characteristics are measured the year the student joined the study.

Students are flagged as being economically and academically disadvantaged at baseline if they met the following state criteria: (1) a student is economically disadvantaged, and (2) a student nearly met or did not meet standards on either the mathematics or English Language Arts eighth-grade standardized tests.

Distributions may not add to 100 percent because of rounding.

Sample sizes may vary for some characteristics due to missing values. Only characteristics with more than 5 percent of the sample missing are noted.

^aStudents who said they are Hispanic and chose a race are included only in the Hispanic category. Students who chose American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, or more than one race are included in the Other category.

^bAbout 6 percent to 7 percent of the study sample are missing data for this characteristic.

APPENDIX TABLE A.6. Differences in High School Experiences Related to Key Components of California Partnership Academies: School Within a School

Measure	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Students take most classes together				
Reported taking most classes with the same group of students during sophomore, junior, and senior years (%)	88.2	44.6	43.6***	<0.001
Number of classes taken with the same students and teacher during senior year (%):				
0 or 1	12.3	43.4	-31.1***	<0.001
2 or 3	62.1	49.6	12.5***	0.006
4 or more	25.6	7.1	18.5***	<0.001
Dedicated counselor				
Students who gave a high rating on overall measure of counselor support ^{a,b} (%)	67.8	66.2	1.6	0.712
Number of times interacting with a counselor during senior year ^b	5.1	4.1	1.0*	0.058
Sample size (total = 813)	659	154		

SOURCE: MDRC calculations from a survey of study participants during senior year of high school.

NOTES: Estimated differences are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in calculating differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Distributions may not add to 100 percent because of rounding.

Two cohorts of students from one high school took the senior survey as juniors.

Sample sizes may vary for some measures due to survey nonresponse. Only measures with more than 5 percent of the survey sample missing are noted.

^aThe overall counselor support composite consists of four survey items that measure students' level of agreement on their counselor's awareness of their educational and career aspirations and whether their counselor provided useful information and guidance about their educational and career goals. The scale for each item ranges from 1 (strongly disagree) to 4 (strongly agree). Students with an average composite score of 3 (agree) or higher are identified as reporting a high rating for overall counselor support. Students must provide at least three out of four valid responses to the counselor support items for a composite score to be calculated.

^bMissing responses for up to 9 percent of the survey sample.

APPENDIX TABLE A.7. Differences in High School Experiences Related to Key Components of California Partnership Academies: Integration of Academic and Career Technical Education

Measure	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Coordinated career and academic course curricula				
Reported teachers often or always connected academic and career coursework ^a (%)	52.1	42.5	9.6*	0.058
High-quality career and technical education (CTE)				
Reported taking at least one CTE course during high school ^a (%)	95.9	78.9	17.0***	<0.001
Number of CTE courses taken during high school ^a	3.8	2.2	1.6***	<0.001
Reported earning or expecting to earn an industry certification ^a (%)	43.1	14.4	28.7***	<0.001
Rigorous college prep courses				
Reported taking at least one class and earning or expecting to earn college credit ^a (%)	84.3	74.4	9.9***	0.005
Number of classes taken where a student earned or expects to earn college credits ^a	3.1	3.4	-0.3	0.476
Types of college credits earned or expected to earn ^{a,b} (%)				
General education (that is, English, math, science, or history)	62.0	65.7	-3.7	0.430
Career/industry-focused	41.6	20.3	21.3***	<0.001
Both	21.0	13.1	7.9**	0.048
Sample size (total = 813)	659	154		

SOURCE: MDRC calculations from a survey of study participants during their senior year of high school.

NOTES: Estimated differences are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in calculating differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Two cohorts of students from one high school took the senior survey as juniors.

Sample sizes may vary for some measures due to survey nonresponse. Only measures with more than 5 percent of the survey sample missing are noted.

^aMissing responses for up to 30 percent of the survey sample.

^bDistributions do not add to 100 percent because categories are not mutually exclusive.

APPENDIX TABLE A.8. Differences in High School Experiences Related to Key Components of California Partnership Academies: Employer Partners and Work-Based Learning Opportunities

Measure	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
College learning opportunities				
Opportunities to learn about college options through: ^a (%)				
Guest speakers				
None	22.2	34.0	-11.8***	0.002
One or two	34.8	38.1	-3.3	0.455
Three or more	42.9	27.7	15.2***	<0.001
College visits				
None	30.1	47.4	-17.3***	<0.001
One or two	32.5	34.9	-2.4	0.575
Three or more	37.4	17.7	19.7***	<0.001
College rep. visits at school or meetings with students				
None	26.8	37.7	-10.9***	0.007
One or two	41.2	40.5	0.7	0.874
Three or more	32.0	21.9	10.1**	0.012
Career learning opportunities				
Opportunities to learn about career options through: ^a (%)				
Career fairs				
None	33.7	44.1	-10.4**	0.014
One or two	44.9	44.4	0.5	0.916
Three or more	21.4	11.5	9.9***	0.006
Guest speakers				
None	21.2	40.8	-19.6***	<0.001
One or two	35.6	33.8	1.8	0.688
Three or more	43.2	25.4	17.8***	<0.001
Trips to local employers				
None	68.9	85.7	-16.8***	<0.001
One or two	23.0	12.5	10.5***	0.006
Three or more	8.2	1.9	6.3***	0.008
Employer visits at school or meetings with students				
None	43.5	63.2	-19.7***	<0.001
One or two	33.5	24.1	9.4**	0.030
Three or more	23.0	12.7	10.3***	0.006

(continued)

APPENDIX TABLE A.8. Continued

Measure	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Work-based learning participation				
Ever or currently participating in any of the following work-based learning opportunities: ^{b,c} (%)				
Unpaid internship	15.0	10.6	4.4	0.193
Paid internship	9.8	8.1	1.7	0.570
Job shadowing	20.7	11.0	9.7***	0.009
Mentorships	16.5	1.9	14.6***	<0.001
Workplace visits	11.5	8.3	3.2	0.308
Career-themed summer camps/workshops	8.9	6.4	2.5	0.366
Career-themed competitions	6.5	1.9	4.6**	0.044
Other	7.2	2.0	5.2**	0.033
Any of the above	56.7	36.2	20.5***	<0.001
Among those reporting ever or currently participating in an internship:				
<i>Number of hours participated in an internship during high school^d</i>	78.7	101.8		
Among those reporting ever or currently participating in a work-based learning experience:				
<i>Reported that their work-based learning experience(s) were helpful or very helpful in identifying career options after high school (%)</i>	77.9	71.5		
Sample size (total = 813)	659	154		

SOURCE: MDRC calculations from a survey of study participants during their senior year of high school.

NOTES: Estimated differences are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in calculating differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Outcomes shown in italics are calculated for a proportion of the survey sample and statistical significance tests are not conducted.

Two cohorts of students from one high school took the senior survey as juniors.

Sample sizes may vary for some measures due to survey nonresponse. Only measures with more than 5 percent of the survey sample missing are noted.

^aDistributions may not add to 100 percent because of rounding

^bDistributions do not add to 100 percent because categories are not mutually exclusive.

^cMissing responses for about 18 percent of the survey sample.

^dMissing responses for about 21 percent of the sample of respondents that reported ever or currently participating in an internship.

APPENDIX TABLE A.9. Effects of the COVID-19 Pandemic on California Partnership Academy Students' Planned Work-Based Learning Experiences

Measure (%)	Expected Graduation SY2020-2021	Expected Graduation SY2021-2022	Expected Graduation SY2022-2023 or SY2023-2024	All
Planned unpaid internships	18.6	17.2	41.8	22.6
<i>Happened as planned</i>	16.4	14.3	25.0	19.0
<i>Changed or postponed</i>	7.3	21.4	25.0	15.2
<i>Cancelled by the provider or forgone by the student</i>	76.4	64.3	50.0	65.7
Planned paid internships	22.1	22.6	13.2	20.6
<i>Happened as planned</i>	15.8	26.3	30.0	19.8
<i>Changed or postponed</i>	15.8	26.3	30.0	19.8
<i>Cancelled or forgone</i>	68.4	47.4	40.0	60.5
Planned job shadowing	26.5	25.8	36.3	28.1
<i>Happened as planned</i>	16.9	19.0	30.0	20.3
<i>Changed or postponed</i>	13.0	23.8	23.3	17.2
<i>Cancelled or forgone</i>	70.1	57.1	46.7	62.5
Planned mentorship(s)	15.1	17.2	24.2	17.2
<i>Happened as planned</i>	28.9	28.6	33.3	30.0
<i>Changed or postponed</i>	26.7	28.6	47.6	32.5
<i>Cancelled or forgone</i>	44.4	42.9	19.0	37.5
Planned workplace visit(s)	18.3	23.7	17.6	19.2
<i>Happened as planned</i>	9.6	23.5	33.3	16.7
<i>Changed or postponed</i>	23.1	11.8	33.3	22.6
<i>Cancelled or forgone</i>	67.3	64.7	33.3	60.7
Planned career-themed summer camps/workshop(s)	8.5	18.3	12.1	1.0
<i>Happened as planned</i>	18.2	15.4	40.0	22.2
<i>Changed or postponed</i>	18.2	23.1	10.0	17.8
<i>Cancelled or forgone</i>	63.6	61.5	50.0	60.0
Planned career-themed competition(s)	7.9	6.5	5.5	7.2
<i>Happened as planned</i>	4.8	0.0	50.0	10.3
<i>Changed or postponed</i>	42.9	0.0	25.0	34.5
<i>Cancelled or forgone</i>	52.4	100.0	25.0	55.2
Planned other work-based learning activities	2.5	2.2	1.1	2.2
<i>Happened as planned</i>	37.5	100.0	100.0	50.0
<i>Changed or postponed</i>	25.0	0.0	0.0	20.0
<i>Cancelled or forgone</i>	37.5	0.0	0.0	30.0
Sample size	407	141	111	659

(continued)

APPENDIX TABLE A.9. Continued

SOURCE: MDRC calculations from a survey of study participants during their senior year of high school.

NOTES: Values are simple means for students offered enrollment into a California Partnership Academy (CPA), by expected high school graduation year.

Two cohorts of students from one high school took the senior survey as juniors.

Bolded rows show the percentage of CPA students who planned to participate in each work-based learning activity. The italicized rows show, among the CPA students who planned to participate in each activity, the percentage of students whose activities happened as planned, were changed or postponed, or were cancelled or forgone due to the COVID-19 pandemic. Distributions in italics may not add to 100 percent because of rounding.

About 24 percent of CPA students did not provide responses to the planned work-based learning survey item.

APPENDIX TABLE A.10. Early Outcomes

Measure (%)	CPA Group	Non-CPA Group	Estimated Difference	P-Value for Estimated Difference
Personalized attention				
Students who gave a high rating on the overall measure of personalized attention from teachers ^{a,b}	36.5	28.4	8.1 *	0.080
Students who agree or strongly agree that they have at least one adult mentor who they trust to support them with personal issues	82.6	83.6	-1.0	0.784
Students who agree or strongly agree that they have at least one adult mentor who can help them with school-related problems	88.2	82.0	6.2 **	0.049
High teacher expectations				
Students who gave a high rating on the overall measure of high teacher expectations ^c	45.9	41.6	4.3	0.353
Peer collaboration				
Students who gave a high rating on the overall measure of peer collaboration ^d	59.8	36.9	22.9 ***	<0.001
Perceived relevance of schoolwork				
Students who gave a high rating on the overall measure of perceived relevance of schoolwork ^e	43.0	41.6	1.4	0.758
Plans after high school				
After high school, plan to: ^f				
Attend a two-year college	38.0	38.6	-0.6	0.900
Attend a four-year college/university	61.2	56.1	5.1	0.227
Attend a career training program	7.5	10.5	-3.0	0.223
Enter an apprenticeship program	0.9	2.7	-1.8 *	0.087
Work a part-time job	34.2	31.4	2.8	0.528
Work a full-time job	8.8	12.7	-3.9	0.147
Enter the military	3.1	3.1	0.0	0.991
Work or volunteer for a year	2.8	5.3	-2.5	0.122
Other	4.8	4.3	0.5	0.814
Students who report feeling prepared enough or completely prepared for future college or career plans	50.0	38.5	11.5 **	0.013
Sample size (total = 813)	659	154		

(continued)

APPENDIX TABLE A.10. Continued

SOURCE: MDRC calculations from the Next Generation California Partnership Academies High School Senior Survey.

NOTES: Estimated differences are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in calculating differences.

Two-tailed t-tests were used to assess differences between the CPA and non-CPA groups. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Sample sizes may vary for some measures due to survey nonresponse. Only measures with more than 5 percent of the survey sample missing are noted.

Two cohorts of students from one high school took the senior survey as juniors.

The personalized-attention-from-teachers, peer-collaboration, and perceived-relevance-of-schoolwork composite measures are each constructed by calculating the average score for the survey items that assess that summary measure. For a composite score to be calculated, students must answer the majority of items that comprise a composite measure (at least two out of three items for the personalized-attention-from-teachers and perceived-relevance-of-schoolwork composites, at least three out of four items for the high-teacher-expectations measure, and all items for the peer-collaboration composite).

^aThe personalized-attention-from-teachers composite consists of three survey items that measure students' reporting on how many of their teachers make sure their students get help with a personal problem, go out of their way to make sure their students understand what's being taught, and care about their students' futures after high school. The scale ranges from 1 (none) to 5 (all teachers). Students with an average composite score of 4 (most teachers) or higher are identified as reporting a high rating for overall personalized attention from teachers.

^bMissing responses for about 9 percent of the survey sample.

^cThe high-teacher-expectations composite consists of four survey items that measure students' reporting on how many of their teachers really care if students try hard, feel challenged, can write and speak well, and truly understand the material being taught. The scale ranges from 1 (none) to 5 (all teachers). Students with an average composite score of 4 (most teachers) or higher are identified as reporting a high rating for overall high teacher expectations.

^dThe peer-collaboration composite consists of two survey items that measure students' reporting on whether their classmates help each other and rely on each other to get through difficult assignments. The scale ranges from 1 (not at all true) to 4 (very true). Students with an average composite score of 3 (true) or higher are identified as reporting a high rating for overall peer collaboration.

^eThe perceived-relevance-of-schoolwork composite consists of three survey items that measure students' reporting on whether they feel they are learning a lot, see the point of school, and want to learn more in the future. The scale ranges from 1 (not at all true) to 4 (very true). Students with an average composite score of 3 (true) or higher are identified as reporting a high rating for overall perceived relevance of schoolwork.

^fDistributions do not add to 100 percent because categories are not mutually exclusive.

APPENDIX TABLE A.11. Estimated Impacts on High School and Postsecondary Outcomes

Outcome	CPA Group	Non-CPA Group	Estimated Impact	P-Value of Estimated Impact
Findings four years after the start of high school				
Graduated from a California public high school (%)	92.9	92.9	0.0	0.999
Met California college readiness course requirements ^a (%)	60.2	55.5	4.7	0.156
Sample size (total = 1089)	854	235		
Findings five years after the start of high school				
Graduated from a California public high school (%)	93.9	92.7	1.2	0.526
Met California college readiness course requirements ^a (%)	58.9	54.5	4.4	0.225
Postsecondary enrollment during the first year after expected high school graduation (%):				
Four-year college/university	32.7	28.0	4.6	0.196
Community college or trade school	36.2	36.9	-0.7	0.855
Any of the above	68.9	65.0	3.9	0.268
Sample size (total = 961)	759	202		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: Estimated impacts are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated impact. Rounding may cause slight discrepancies in calculating differences.

A two-tailed t-test was applied to each estimated impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Sample sizes are smaller for the findings five years after the start of high school because data for some students were not yet available at the time of data collection.

^aThe University of California and California State University systems have established a minimum set of high school courses required for admission as a freshman called "A-G course requirements." Students must pass each course with a grade of "C" or better.

APPENDIX TABLE A.12. Estimated Impacts on High School and Postsecondary Outcomes, by Gender

Outcome	CPA Group	Non-CPA Group	Estimated Impact	P-Value of Estimated Impact	Estimated Difference Between Subgroup Impacts	P-Value of Difference Between Subgroup Impacts
Findings four years after the start of high school						
Graduated from a California public high school (%)					-3.4	0.413
Young men	91.1	93.1	-2.0	0.568		
Young women	94.1	92.7	1.4	0.536		
Met California college readiness course requirements ^a (%)					-19.9	0.004 ⁺⁺⁺
Young men	55.3	63.1	-7.8	0.161		
Young women	63.8	51.7	12.1 ^{***}	0.004		
Young men (total = 446)	360	86				
Young women (total = 643)	494	149				
Findings five years after the start of high school						
Graduated from a California public high school (%)					-0.6	0.891
Young men	92.5	91.4	1.1	0.745		
Young women	95.1	93.4	1.7	0.486		
Met California college readiness course requirements ^a (%)					-18.1	0.015 ⁺⁺
Young men	54.2	60.4	-6.2	0.280		
Young women	62.6	50.7	11.9 ^{**}	0.012		
Postsecondary enrollment during the first year after expected high school graduation (%):						
Four-year college/university					-5.0	0.491
Young men	28.1	26.1	2.0	0.717		
Young women	36.2	29.2	7.0	0.141		
Community college or trade school					3.9	0.631
Young men	36.8	34.1	2.7	0.662		
Young women	35.8	36.9	-1.1	0.824		
Any of the above					-1.1	0.877
Young men	65.0	60.2	4.8	0.421		
Young women	72.0	66.1	5.9	0.190		
Young men (total = 416)	334	82				
Young women (total = 545)	425	120				

(continued)

APPENDIX TABLE A.12. Continued

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: Estimated impacts are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated impact. Rounding may cause slight discrepancies in calculating differences.

A two-tailed t-test was applied to each estimated impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

A two-tailed t-test was applied to the difference in estimated impacts between subgroups. Statistical significance levels are indicated as: ††† = 1 percent; †† = 5 percent; † = 10 percent.

Sample sizes are smaller for the findings five years after the start of high school because data for some students were not yet available at the time of data collection.

^aThe University of California and California State University systems have established a minimum set of high school courses required for admission as a freshman called "A-G course requirements." Students must pass each course with a grade of "C" or better.

APPENDIX TABLE A.13. Estimated Impacts on High School and Postsecondary Outcomes, by Level of Disadvantaged Status

Outcome	CPA Group	Non-CPA Group	Estimated Impact	P-Value of Estimated Impact	Estimated Difference Between Subgroup Impacts	P-Value of Difference Between Subgroup Impacts
Findings four years after the start of high school						
Graduated from a California public high school (%)					-0.8	0.836
Meets both criteria of disadvantage	91.7	91.6	0.1	0.984		
Does not meet both criteria	93.9	93.1	0.9	0.718		
Meets California college readiness course requirements ^a (%)					14.0	0.041 ++
Meets both criteria of disadvantage	47.5	34.3	13.3 **	0.012		
Does not meet both criteria	71.7	72.5	-0.8	0.863		
Meets both criteria of disadvantage (total = 514)	408	106				
Does not meet both criteria (total = 575)	446	129				
Findings five years after the start of high school						
Graduated from a California public high school (%)					-1.3	0.731
Meets both criteria of disadvantage	92.8	91.9	0.9	0.769		
Does not meet both criteria	95.1	92.9	2.2	0.364		
Meets California college readiness course requirements ^a (%)					12.0	0.105
Meets both criteria of disadvantage	46.1	35.1	11.0 **	0.045		
Does not meet both criteria	71.2	72.2	-0.9	0.849		
Postsecondary enrollment during the first year after expected high school graduation (%):						
Four-year college/university					9.7	0.185
Meets both criteria of disadvantage	23.1	13.9	9.2 *	0.052		
Does not meet both criteria	42.0	42.5	-0.5	0.927		
Community college or trade school					-7.5	0.340
Meets both criteria of disadvantage	36.5	40.4	-4.0	0.477		
Does not meet both criteria	36.0	32.5	3.5	0.525		
Any of the above					2.2	0.762
Meets both criteria of disadvantage	59.5	54.3	5.2	0.349		
Does not meet both criteria	78.0	75.0	3.0	0.511		

(continued)

APPENDIX TABLE A.13. Continued

Outcome	CPA Group	Non-CPA Group	Estimated Impact	P-Value of Estimated Impact	Estimated Difference Between Subgroup Impacts	P-Value of Difference Between Subgroup Impacts
Meets both criteria of disadvantage (total = 473)	373	100				
Does not meet both criteria (total = 488)	386	102				

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: Students are flagged as being economically and academically disadvantaged at baseline if they met the following state criteria: (1) a student is economically disadvantaged, and (2) a student nearly met or did not meet standards on either the mathematics or English Language Arts eighth-grade standardized tests.

Estimated impacts are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated impact. Rounding may cause slight discrepancies in calculating differences.

A two-tailed t-test was applied to each estimated impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

A two-tailed t-test was applied to the difference in estimated impacts between subgroups. Statistical significance levels are indicated as: ††† = 1 percent; †† = 5 percent; † = 10 percent.

Sample sizes are smaller for the findings five years after the start of high school because data for some students were not yet available at the time of data collection.

^aThe University of California and California State University systems have established a minimum set of high school courses required for admission as a freshman called “A-G course requirements.” Students must pass each course with a grade of “C” or better.

APPENDIX TABLE A.14. Compliance Rates

Outcome	CPA Group	Non-CPA Group	Estimated Difference	P-Value of Estimated Difference
Four-year sample				
Ever enrolled in a CPA (%)	85.9	9.0	76.9 ***	<0.001
Sample size (total = 1089)	854	235		
Five-year sample				
Ever enrolled in a CPA (%)	85.4	10.6	74.8 ***	<0.001
Sample size (total = 961)	759	202		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: Participation in the treatment (CPA enrollment) is defined as having ever enrolled in a CPA, at any point during high school.

The Estimated Difference represents the “compliance rate,” or the difference in treatment take-up rates between the treatment group (CPA) and the comparison group (non-CPA). Compliance rates are regression-adjusted for the blocking of random assignment and selected baseline characteristics.

Values for the CPA group are simple means for all students offered a spot in a CPA. The value for the non-CPA group equals the CPA group mean minus the estimated difference. Rounding may cause slight discrepancies in calculating differences.

A two-tailed t-test was applied to each estimated difference. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

APPENDIX TABLE A.15. Local Average Treatment Effect (LATE) Estimates for High School and Postsecondary Outcomes

Outcome	Estimated LATE Impact	P-value of Estimated LATE Impact
Findings four years after the start of high school		
Graduated from a California public high school (%)	0.0	0.999
Met California college readiness course requirements ^a (%)	6.2	0.155
Sample size (total = 1089) ^b		
Findings five years after the start of high school		
Graduated from a California public high school (%)	1.6	0.525
Met California college readiness course requirements ^a (%)	5.8	0.225
Postsecondary enrollment during the first year after expected high school graduation (%):		
Four-year college/university	6.2	0.195
Community college or trade school	-1.0	0.855
Any of the above	5.2	0.268
Sample size (total = 961) ^b		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: LATE estimates are calculated from a two-stage least squares regression model using the random assignment group as the instrumental variable and are adjusted for the blocking of random assignment and selected baseline characteristics.

A two-tailed t-test was applied to each estimated LATE impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Sample sizes are smaller for the findings five years after the start of high school because data for some students were not yet available at the time of data collection.

^aThe University of California and California State University systems have established a minimum set of high school courses required for admission as a freshman called “A-G course requirements.” Students must pass each course with a grade of “C” or better.

^bThe sample size represents the full sample of observations. The LATE only measures the effect of CPA enrollment for the compliers, which are the subgroup of students who enroll in the CPA because they were assigned to the CPA group. Thus, the LATE estimates are scaled by the number of compliers in the CPA group.

APPENDIX TABLE A.16. Estimated Initial-Offer Impacts on High School and Postsecondary Outcomes

Outcome	Initially Offered CPA	Not Offered CPA	Estimated Initial-Offer Impact	P-Value of Estimated Initial-Offer Impact
Findings four years after the start of high school				
Graduated from a California public high school (%)	92.8	93.0	-0.2	0.913
Met California college readiness course requirements ^a (%)	60.3	55.7	4.6	0.169
Sample size (total = 1028)	793	235		
Findings five years after the start of high school				
Graduated from a California public high school (%)	93.9	92.9	1.1	0.593
Met California college readiness course requirements ^a (%)	58.9	54.6	4.3	0.233
Postsecondary enrollment in the first year after expected high school graduation (%):				
Four-year college/university	33.3	28.3	5.0	0.170
Community college or trade school	35.7	36.9	-1.2	0.763
Any of the above	69.0	65.2	3.8	0.287
Sample size (total = 908)	706	202		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: Estimated initial-offer impacts are regression-adjusted for the blocking of random assignment and selected baseline characteristics. Values for the initially offered CPA group are simple means for all students initially offered a spot in a CPA. The value for the not offered CPA group equals the initially offered CPA group mean minus the estimated initial-offer impact. Rounding may cause slight discrepancies in calculating differences.

A two-tailed t-test was applied to each estimated initial-offer impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Sample sizes are smaller for the findings five years after the start of high school because data for some students were not yet available at the time of data collection.

^aThe University of California and California State University systems have established a minimum set of high school courses required for admission as a freshman called "A-G course requirements." Students must pass each course with a grade of "C" or better.

APPENDIX TABLE A.17. Local Average Treatment Effect (LATE) Initial-Offer Estimates for High School and Postsecondary Outcomes

Outcome	Estimated LATE Initial-Offer Impact	P-value of Estimated LATE Initial-Offer Impact
Findings four years after the start of high school		
Graduated from a California public high school (%)	-0.3	0.913
Met California college readiness course requirements ^a (%)	5.9	0.168
Sample size (total = 1028) ^b		
Findings five years after the start of high school		
Graduated from a California public high school (%)	1.4	0.592
Met California college readiness course requirements ^a (%)	5.7	0.232
Postsecondary enrollment during the first year after expected high school graduation (%):		
Four-year college/university	6.5	0.170
Community college or trade school	-1.5	0.763
Any of the above	5.0	0.286
Sample size (total = 908) ^b		

SOURCE: MDRC calculations use the California Department of Education student data from the 2017-2018 through 2022-2023 school years.

NOTES: LATE estimates are calculated from a two-stage least squares regression model using the random assignment group as the instrumental variable and are adjusted for the blocking of random assignment and selected baseline characteristics.

A two-tailed t-test was applied to each estimated LATE initial-offer impact. Statistical significance levels are indicated as *** = 1 percent; ** = 5 percent; * = 10 percent.

Sample sizes are smaller for the findings five years after the start of high school because data for some students were not yet available at the time of data collection.

^aThe University of California and California State University systems have established a minimum set of high school courses required for admission as a freshman called "A-G course requirements." Students must pass each course with a grade of "C" or better.

^bThe sample size represents the full sample of observations. The LATE only measures the effect of CPA enrollment for the compliers, which are the subgroup of students who enroll in the CPA because they were assigned to the CPA group. Thus, the LATE estimates are scaled by the number of compliers in the CPA group.

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ABOUT MDRC

MDRC, a nonprofit, nonpartisan social and education policy research organization, is committed to finding solutions to some of the most difficult problems facing the nation. We aim to reduce poverty and bolster economic mobility; improve early child development, public education, and pathways from high school to college completion and careers; and reduce inequities in the criminal justice system. Our partners include public agencies and school systems, nonprofit and community-based organizations, private philanthropies, and others who are creating opportunity for individuals, families, and communities.

Founded in 1974, MDRC builds and applies evidence about changes in policy and practice that can improve the well-being of people who are economically disadvantaged. In service of this goal, we work alongside our programmatic partners and the people they serve to identify and design more effective and equitable approaches. We work with them to strengthen the impact of those approaches. And we work with them to evaluate policies or practices using the highest research standards. Our staff members have an unusual combination of research and organizational experience, with expertise in the latest qualitative and quantitative research methods, data science, behavioral science, culturally responsive practices, and collaborative design and program improvement processes. To disseminate what we learn, we actively engage with policymakers, practitioners, public and private funders, and others to apply the best evidence available to the decisions they are making.

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