Comparing Students in Each California Partnership Academy with Non-Academy Students at the Same High School, 2009-10

AUGUST 2012

CASN
CAREER ACADEMY SUPPORT NETWORK
University of California • Berkeley

Comparing Students in Each California Partnership Academy with Non-Academy Students at the Same High School, 2009-10

David Stern, Phil Saroyan, and Candace Hamilton Hester

Career Academy Support Network
University of California, Berkeley
August 2012

The California Department of Education and the James Irvine Foundation provided support for preparation of this report. We wish to thank Dr. Patrick Ainsworth, Dr. Keith Edmonds, Jerauld Winthrop, Christopher Mattson, and Karen Shores at the Department, and Anne Stanton and Aaron Pick at the Foundation, for their support, encouragement, and guidance. The contents do not necessarily reflect the positions or policies of the funders, however, and the authors alone are responsible for any shortcomings of this report. As always, we want especially to acknowledge the dedicated teachers and administrators whose work in California Partnership Academies enables so many students to find a meaningful and productive path through high school to a fulfilling future.

EXECUTIVE SUMMARY

This report is a sequel to *Profile of the California Partnership Academies, 2009-2010*.[1] The *Profile* gave an overview of California Partnerships Academies (CPAs), and included some comparisons between CPA students and all high school students in California.

This report provides, for the first time, comparisons between students in each CPA and non-academy students at the same high school. Administrators and teachers can use this information to guide improvement of individual CPAs.

Like the *Profile*, this report uses data on academy students from the October 2010 reports submitted by each CPA to the California Department of Education (CDE) for the 2009-10 school year. In addition, this report also uses information from the Standardized Testing and Reporting (STAR) program to compare the characteristics of academy and non-academy students, and to analyze scores from the California Standards Tests (CSTs).

The original purpose of CPAs was to identify students who appeared to be at high risk of dropping out of school, and provide an educational experience that would motivate and enable them to obtain high school diplomas. Whether CPAs are achieving this purpose depends on the answer to three main questions:

Are CPAs initially enrolling high-risk students?

Do these students succeed in being promoted from one grade level to the next, and ultimately graduating?

During their years in the academy, does the academic performance of high-risk students improve?

This report provides partial answers to these questions, by comparing students in each CPA with non-academy students at the same high school.

Comparing characteristics of academy and non-academy students in grade 10

To determine whether CPAs are initially enrolling high-risk students, we compared the characteristics of academy and non-academy students in grade 10. CPAs are located in high schools where parents of 10th graders have less education and lower income, and where more 10th graders are Latinos, English Language Learners, and had lower grade 9 test scores in English Language Arts.

Within high schools that have CPAs, the academy 10th graders also have parents with less education and income, compared with non-academy 10th graders, and the academies enroll larger percentages of Latinos and African Americans. Academies enroll more students who have ever been classified as English Language Learners, but compared to non-academy students the academies have more 10th graders who have been reclassified as proficient in English, and fewer

[1] Charles Dayton, Candace Hamilton Hester, and David Stern, *Profile of the California Partnership Academies, 2009-2010*. Career Academy Support Network, UC Berkeley, October 2011. Available at http://casn.berkeley.edu/downloads/CPA_Report_2009-10.pdf

who are still classified as English learners. Academies also enroll a lower percentage of special education students. As a result, the academies have fewer 10th graders whose 9th grade test scores were in the lowest quartile. When the comparison does not include special educations students, the academies show more students whose 9th grade test scores were in the bottom three quartiles, and fewer in the top quartile.

In addition to comparing these overall percentages, we also compared 10th graders in each academy with non-academy 10th graders *at the same school*. For each comparison, a standard statistical test was used to determine whether the difference was statistically significant ($p<0.05$), or whether the difference could likely be attributable to chance variation. Most of the differences were not statistically significant —– meaning that in most CPAs the academy 10th graders are similar to non-academy 10th graders at the host school.

But in many cases the academy 10th graders are significantly different from their non-academy peers at the same school. For instance, 106 academies had significantly larger proportions of females in grade 10, compared to non-academy students at the same school, while 71 academies had significantly larger proportions of males. This reflects the fact that some industry sectors, e.g. health, enroll more female students, while others, e.g. building trades, enroll more males.

Consistent with the intent of the law, the number of CPAs that over-represent low-income 10th graders is larger than the number that under-represent this group. More CPAs also over-represent 10th graders whose parents have low education, and more academies over-represent Latinos. On the other hand, more CPAs under-represent 10th graders in Special Education, and, even when Special Education students are not included in the analysis, academy 10th graders more often had higher average test scores in grade 9 compared to non-academy students at the same school. In CPAs where initial enrollment patterns do not seem consistent with the intent of the law, administrators and teachers can use these results to examine and improve local practices.

Comparing characteristics of academy and non-academy students in grade 11

To get an indication of whether certain kinds of students are more likely to continue from grade 10 to grade 11, we compared academy and non-academy 11th graders. This is not a truly longitudinal analysis, because the 11th graders analyzed here are a different cohort of students than the 10th graders. In fact, some of the academies with 10th graders were new in 2009-10 and did not yet enroll 11th graders.

Comparisons with all academies combined showed differences between academy and non-academy students in grade 11 that are similar to the differences in grade 10. It remains true that academies are located in schools where parents of 11th graders have lower education and income, and more 11th graders are Latino.

Within these schools that have CPAs, the academy 11th graders have parents with lower education and income, compared with non-academy 11th graders, and larger proportions of the academy students are Latino and Filipino. These differences between academy and non-

academy students in schools that have CPAs are all somewhat bigger in grade 11 than in grade 10.

Comparing grade 11 students in each CPA with non-academy 11th graders at the same school also shows similar patterns in grade 11 as in grade 10. In most CPAs, the differences between academy and non-academy students at the same school were not statistically significant. Again the differences that are significant more often show academies enrolling more 11th graders whose parents have low education and income, and more students who are Latino or Filipino. On each of these characteristics, the preponderance is greater in grade 11 than in grade 10.

Generally, comparisons with all CPAs combined, or with each CPA compared to its host school, showed CPAs were more likely to enroll challenging or under-served populations of students in grade 11 than in grade 10. The only exception is that African American students were more often under-represented in CPAs in grade 11 than in grade 10. Again, it is important to recall that we are comparing two different cohorts of students, one in grade 10 and the other in grade 11, so this is not a truly longitudinal analysis.

Comparing performance of academy and non-academy students

We compared performance of academy and non-academy students on the 2010 California Standards Tests. A separate regression analysis was run for each school and grade level. Predictors of 2010 scores included test scores in the same subject for 2009 and 2008, individual student characteristics, and whether a student was in an academy (or which academy, if the school had more than one). The coefficient on the academy variable indicates whether academy students' average score was better, worse, or not significantly different from non-academy students' score, taking all the other predictors into account.

Most of the academy coefficients were not statistically significant. This result is consistent with previous studies. Again there is important variation. Some academies show significant positive coefficients, and some are significantly negative.

Results for a single year are not conclusive. But compiling this information year after year, and including other outcomes in addition to test scores — such as attendance, credits earned, grades, behavior, and promotion to the next grade level or graduation from grade 12 — can be very helpful in guiding the continuous improvement of academies.

Information to guide improvement of individual academies

Academies vary a great deal in who enrolls, who stays, and whether performance improves. As the number of academies and Linked Learning pathways expands, it becomes increasingly important to monitor each program on an ongoing basis. We illustrate how the information in this report can be summarized in an accessible way for an individual academy. Districts and schools can use this kind of profile to help guide continuous improvement.

TABLE OF CONTENTS

FIGURES AND TABLES

INTRODUCTION

This report is a sequel to *Profile of the California Partnership Academies, 2009-2010*.[2] The *Profile* gave an overview of California Partnerships Academies (CPAs), and included some comparisons between CPA students and all high school students in California.

This report provides, for the first time, comparisons between students in each CPA and non-academy students at the same high school. Administrators and teachers can use this information to guide improvement of individual CPAs.

Like the *Profile*, this report uses data on academy students from the October 2010 reports submitted by each CPA to the California Department of Education (CDE) for the 2009-10 school year. In addition, this report also uses information from the Standardized Testing and Reporting (STAR) program to compare the characteristics of academy and non-academy students, and to analyze scores from the California Standards Tests (CSTs).

For readers who do not have the *Profile* report, the remainder of this Introduction reproduces paragraphs from that report, providing background on the California Partnership Academies.

In 1984, the California State Legislature passed Assembly Bill 3104, launching the California Partnership Academies (CPAs). The authorization was renewed by Senate Bill 605 in 1987, Senate Bill 44 in 1993, and Senate Bill 1354 in 2010. Additional funding came as a result of Senate Bill 70 in 2006 for career-technical pathways, and Assembly Bill 519 in 2009 for "green" academies. With each round of additional funding, CDE has issued a request for proposals, and has awarded grants after a review of competing applications. In 2009-10 there were almost 500 CPAs, enrolling close to 50,000 students in high schools located in 36 different counties.

CPAs have served as a model for high school reform within and beyond California. Many of the districts that received federal Small Learning Community (SLC) grants employed "career academies," often based on California's CPAs in some or all of their SLCs. More recently, in school districts receiving grants from the James Irvine Foundation under its Linked Learning initiative, most of the Linked Learning pathways have been career academies. It is estimated that roughly 700 career academies exist in California and 7,000 in the nation, with both numbers continuing to grow.

More than two decades of evaluations, beginning in the 1980s, have consistently found that career academies, including CPAs, produce positive outcomes for high school students (for a summary of the research, see Stern, Dayton, & Raby 2010). While not all comparisons between academy and non-academy students have been statistically significant, virtually all of the statistically significant differences have indicated better results for academy students.

Several studies, comparing academy students with similar students in the same high schools, found that academy students over the course of their high school years had significantly

[2] Charles Dayton, Candace Hamilton Hester, and David Stern, *Profile of the California Partnership Academies, 2009-2010.* Career Academy Support Network, UC Berkeley, October 2011. Available at http://casn.berkeley.edu/downloads/CPA_Report_2009-10.pdf

improved attendance, earned better grades, completed more course credits, and were less likely to leave high school. A major study by MDRC, using a strict random-assignment design, found that academy students not only improved their performance while in high school but also had significantly greater earnings eight years after high school (Kemple 2008). Other studies also have found that career academies do, in fact, effectively prepare students for careers.

At the same time, studies have found that career academy students also perform well in postsecondary education. The MDRC study found high rates of postsecondary educational attainment among former career academy students. Another notable study, by Maxwell (2001), found that career academy graduates who went on to one of the large California public university campuses were more likely to complete bachelor's degrees, and less likely to need remedial classes along the way, than other graduates from the same urban school district. The strong and consistent track record of career academies is one reason for their continued growth.

CPAs combine a number of high school reform features generally considered to be effective. They:

- Group 10th- through 12th-grade students into several related classes each year.
- Organize cross-curricular teacher teams, both academic and career-technical.
- Frame the academic classes within a broadly defined career theme, while in most cases still enabling students to complete the "a-g" course sequence required for UC and CSU.
- Show students connections between their academic subjects and this career theme.
- Show students connections between their coursework and activities outside the high school.
- Incorporate employer and community support through advisory groups, speakers, field trips, job shadowing, mentors, and internships.

Details of this model are available at the CASN website (http://casn.berkeley.edu), as well as the CDE website (http://www.cde.ca.gov/ci/gs/hs/cpagen.asp).

Among other features of the law that governs CPAs, at least 50% of the students in each incoming class of CPA sophomores must meet three of the following six "at-risk" criteria (defined more specifically in the law): having a poor attendance record, being significantly behind in credits, demonstrating low motivation for the regular school program, being economically disadvantaged, having low state test scores, and having a low grade point average.

CPAs also are required to match their State grant with either funding or in-kind support from both the receiving district and the academy's supporting employers, thereby substantially increasing the value of the State grant. Furthermore, CPA funding is performance-based, dependent on how many students meet specified targets for attendance, credits and graduation. CPAs are required to submit yearly performance data for each enrolled student, and they receive funding only for students who have met or exceeded the performance targets, up to a maximum or "cap". The maximum annual State grant for a CPA in 2009-10 was either $69,120 or $81,000, depending on which State law authorized the funding.

THREE ESSENTIAL QUESTIONS

The original purpose of CPAs was to identify students who appeared to be at high risk of dropping out of school, and provide an educational experience that would motivate and enable them to obtain high school diplomas. Whether CPAs are achieving this purpose depends on the answer to three main questions: Are CPAs initially enrolling high-risk students? Do these students succeed in being promoted from one grade level to the next, and ultimately graduating? During their years in the academy, does the academic performance of high-risk students improve? This report provides partial answers to these questions, by comparing students in each CPA with non-academy students at the same high school.

1. Who enrolls? As noted in the Introduction, at least half the students entering each CPA in grade 10 must meet at least three of six specific criteria indicating higher risk of dropping out. CDE monitors whether individual CPAs meet this requirement. However, CPAs tend to be located in high schools where many or most students would satisfy the at-risk criteria. The law does not require CPAs to enroll students who are more at-risk than other students at the same school, and CDE has not monitored that. Given the original intent of the law, our analysis seeks to determine whether each CPA is enrolling sophomores whose demographic characteristics indicate that they face at least as much challenge as other sophomores at the same school.

2. Who stays? CPAs are intended to enroll at-risk students, and then enable them to graduate. To know whether at-risk sophomores who enter an academy ultimately have higher graduation rates than similar sophomores at the same school, it would be necessary to follow a cohort of grade 10 students through grades 11 and 12. In the future we hope to do that analysis with actual longitudinal data. In this report we simply compare juniors in each CPA with other juniors at the same school. This is not a true longitudinal analysis, but it does reveal whether an academy is continuing to enroll grade 11 students whose demographic characteristics indicate higher risk of dropping out, compared to other juniors at the same school. It is not possible to do this comparison for grade 12 because the STAR assessment does not include grade 12.

3. Does performance improve? In addition to whether students are promoted from one grade to the next and ultimately graduate, it is also important to know whether their academic performance improves. In the future we hope to compare progress of academy and non-academy students on a range of outcomes, including attendance, credits, and grades, as well as test scores. In this report we are limited to test scores. We analyze whether academy students in grades 10 and 11 perform better or worse than non-academy students at the same high school on the California Standards Tests in English Language Arts and in mathematics. The analysis uses multiple regression to control for prior test scores and other student characteristics. However, because of possible unmeasured differences between academy and non-academy students, this analysis may not measure the true causal impact of academies on test scores.

We also provide an example of how all this information can be summarized for an individual academy or pathway, as a guide to continuous improvement. As the number of academies and pathways expands, this kind of information tool will become increasingly important.

WHO ENROLLS?

Comparing Characteristics of Grade 10 Academy and Non-Academy Students

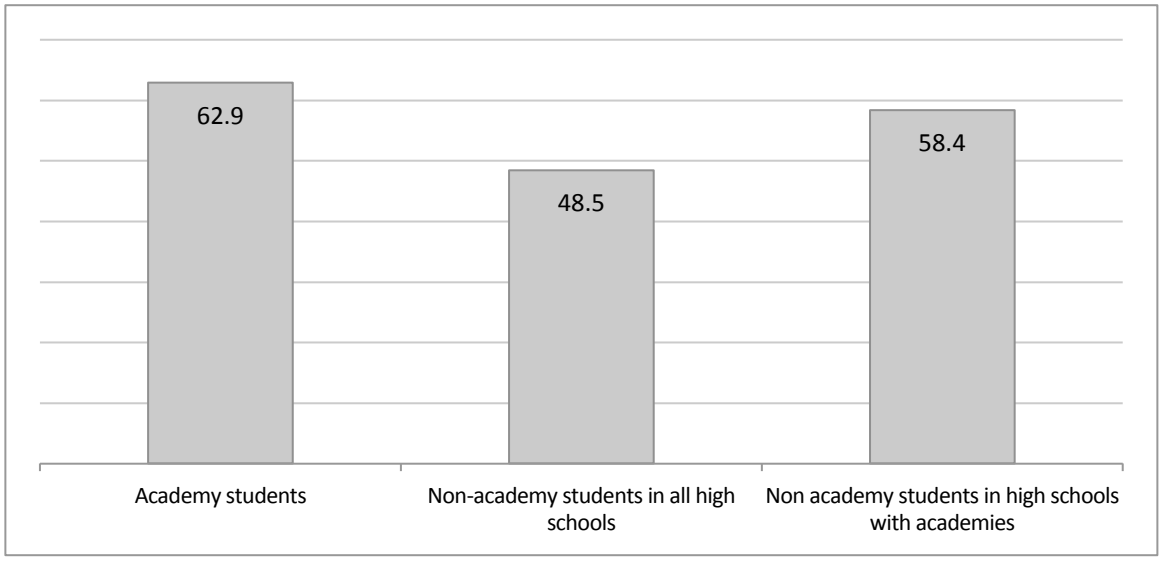
We report two kinds of comparison: first with all academies combined, then for individual academies.

Comparing 10th grade academy and non-academy students in all academies combined

Here we compare the characteristics of all CPA students in grade 10 (n=19,051) with all grade 10 non-academy students in the state (n=480,708), and with the subset of grade 10 non-academy students who were in high schools that had CPAs (n=119,774).

High schools with CPAs enroll students who have lower income and lower achievement, compared to the state as a whole. For example, Figure 1 shows that 48.5 percent of all non-academy 10th graders in the state were eligible for the National School Lunch Program.[3] In schools that had CPAs, 58.4 percent of non-academy 10th graders were eligible, and the eligibility rate for academy students was 62.9 percent. Clearly, high schools with CPAs enrolled relatively more low-income students, and the academies also had larger proportions of low-income students than the rest of those schools.

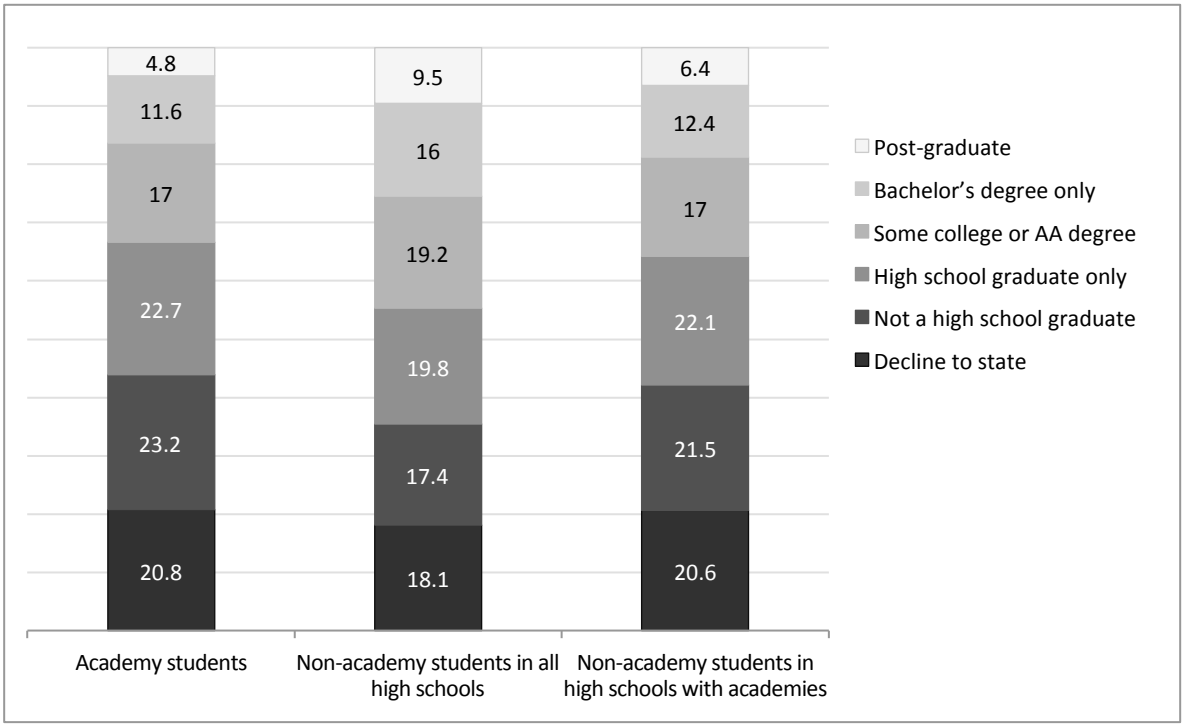
Figure 1: Percent of grade 10 academy and non-academy students eligible for subsidized lunch



Similarly, Figure 2 shows non-academy students in high schools with CPAs had less educated parents than non-academy students in all high schools. Within high schools that had CPAs, academy students also had less educated parents than non-academy students.

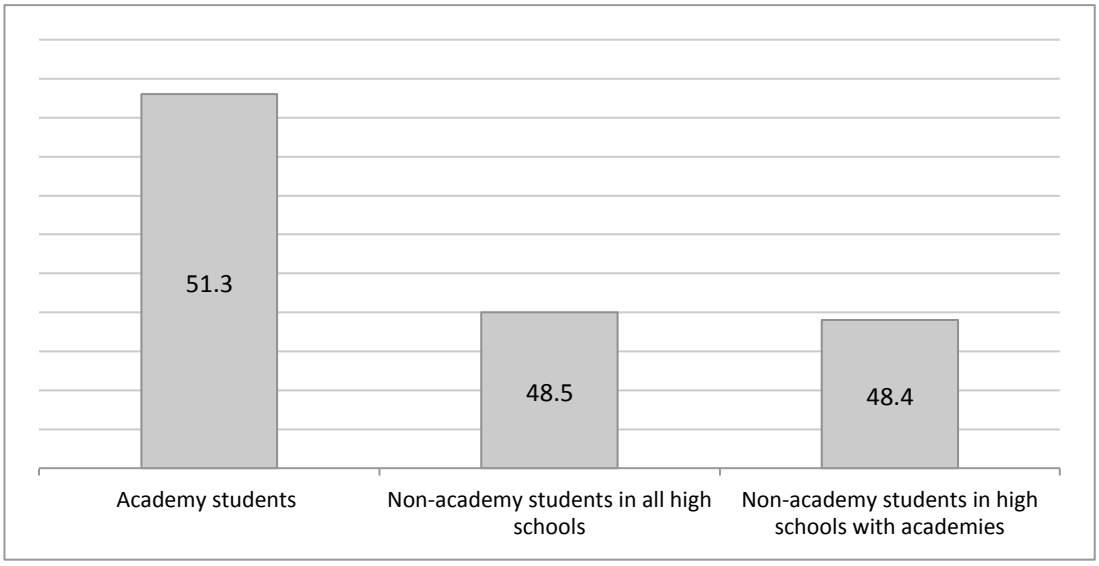
[3] In 2009-10, students were eligible for free lunches if their reported family income was no more than 1.3 times the Federal poverty level. If family income was between 1.3 and 1.85 times the poverty level, students were eligible for subsidized lunch.

Figure 2: Percent of grade 10 academy and non-academy students by parents' education



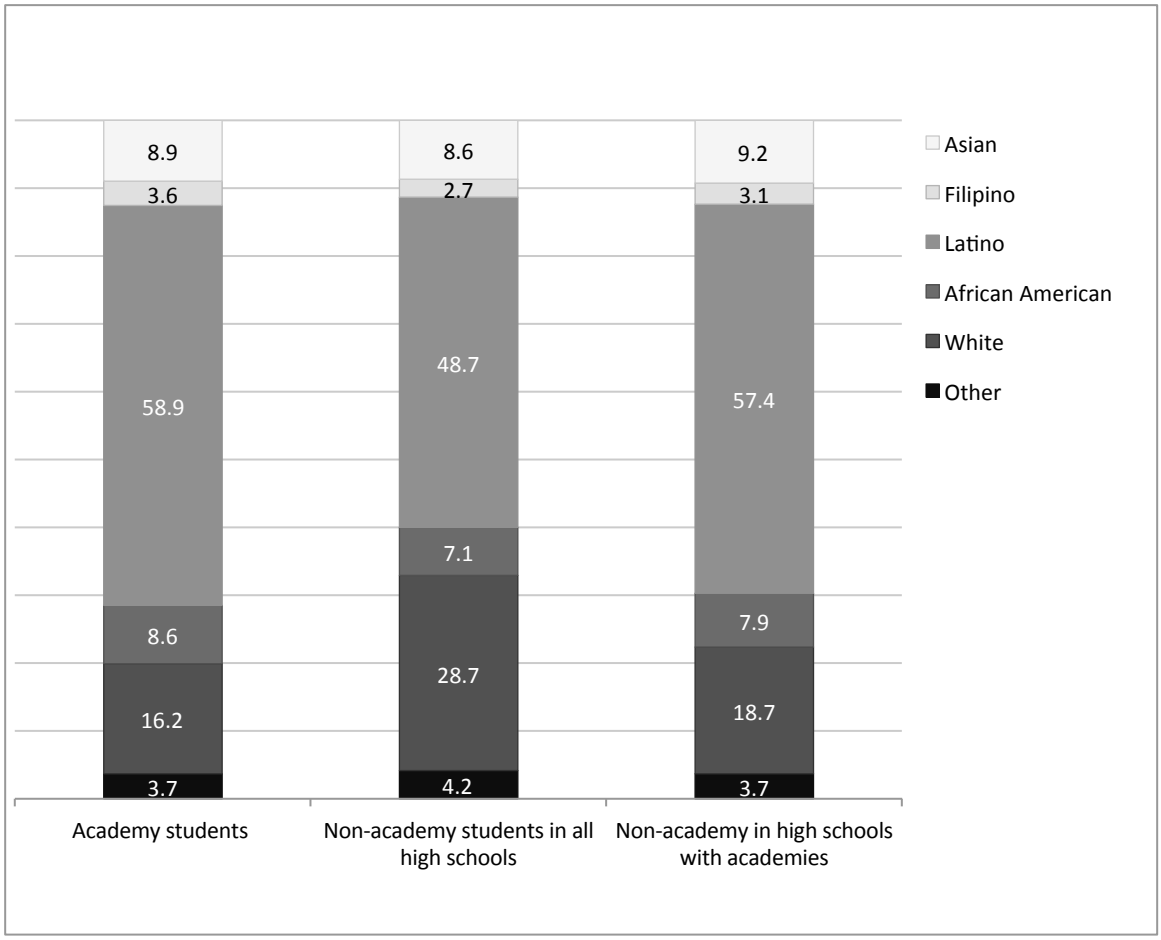
There is little difference between the percent of females among non-academy students in schools with CPAs compared to non-academy students in all high schools. But CPAs enrolled a larger percentage of females in grade 10, as Figure 3 shows.

Figure 3: Percent of females among grade 10 academy and non-academy students



In Figure 4 we see that CPAs had large proportions of Latino, Filipino, and African American students compared to non-academy students in the same schools, and even more so compared to non-academy students in all schools. Conversely, the proportion of white students was lowest in the CPAs.

Figure 4: Percent of grade 10 academy and non-academy students by race or ethnicity



Economic disadvantage and low achievement are among the required criteria for selecting CPA students in grade 10, but English language fluency is not. Figure 5 shows that 57.5 percent of academy 10th graders did not have English as their first language, compared to 53.6 percent of non-academy students in the same schools, and 42.9 percent of non-academy students in all schools. However, compared to non-academy students in the same schools, a larger proportion of CPA students had been reclassified as Fluent English Proficient, and a smaller proportion were still classified as English Language Learners.

Being in Special Education (with an Individual Education Plan) also is not one of the criteria for defining the "at-risk" students CPAs are required to enroll in grade 10. Figure 6 shows that the proportion of Special Education students in CPAs is lower than among non-academy students.

Figure 5: Percent of grade 10 academy and non-academy students ever classified as English Language Learners

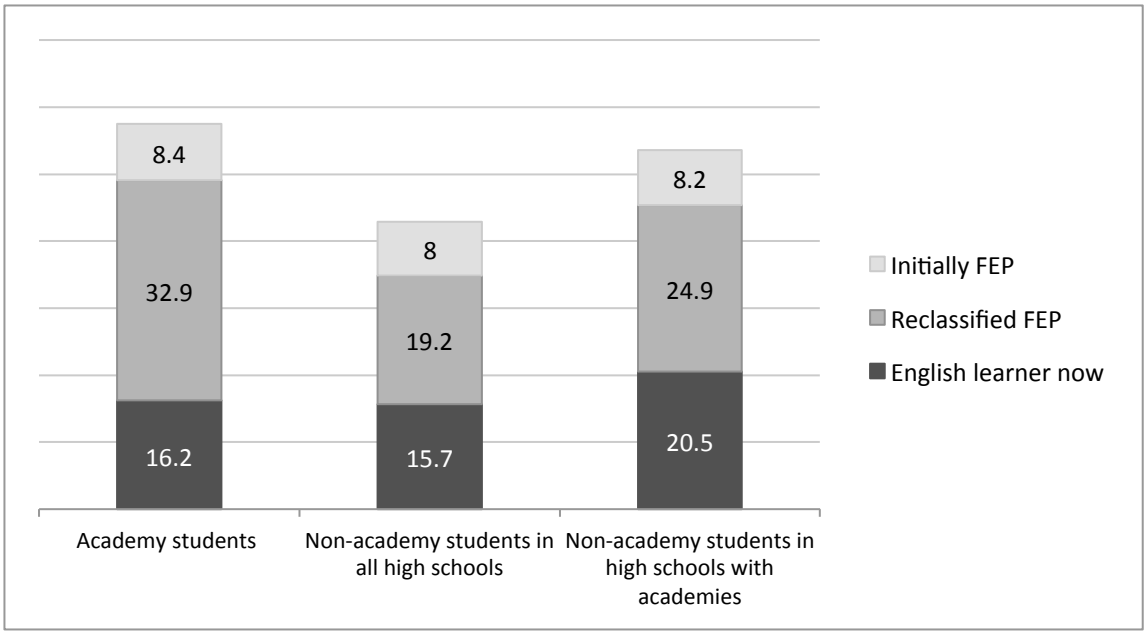
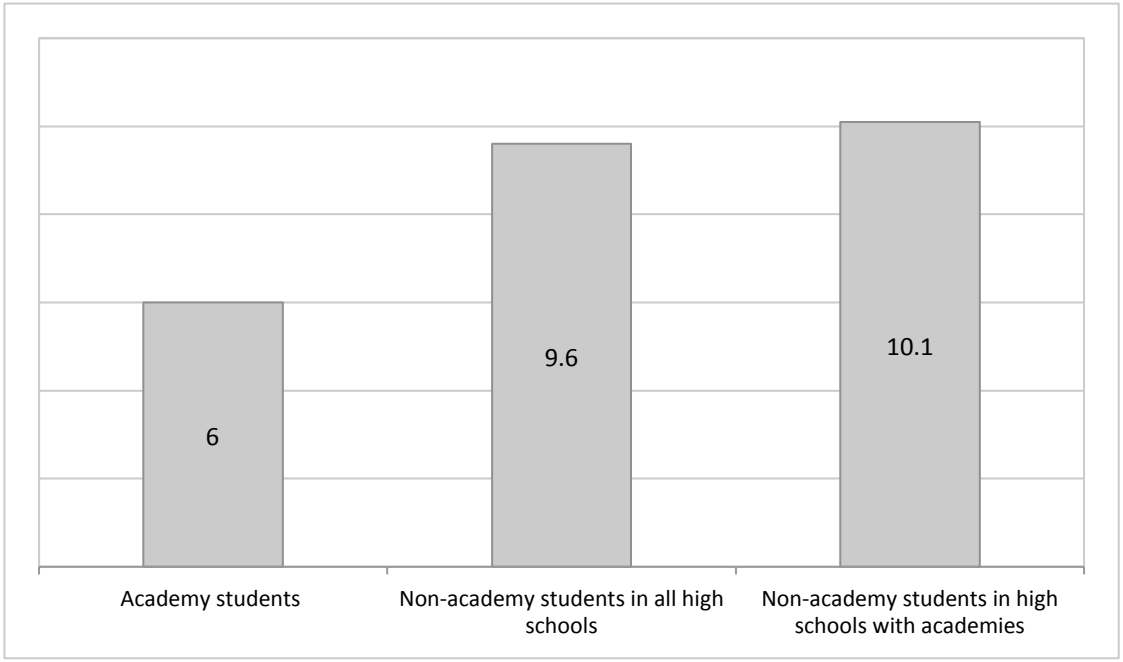
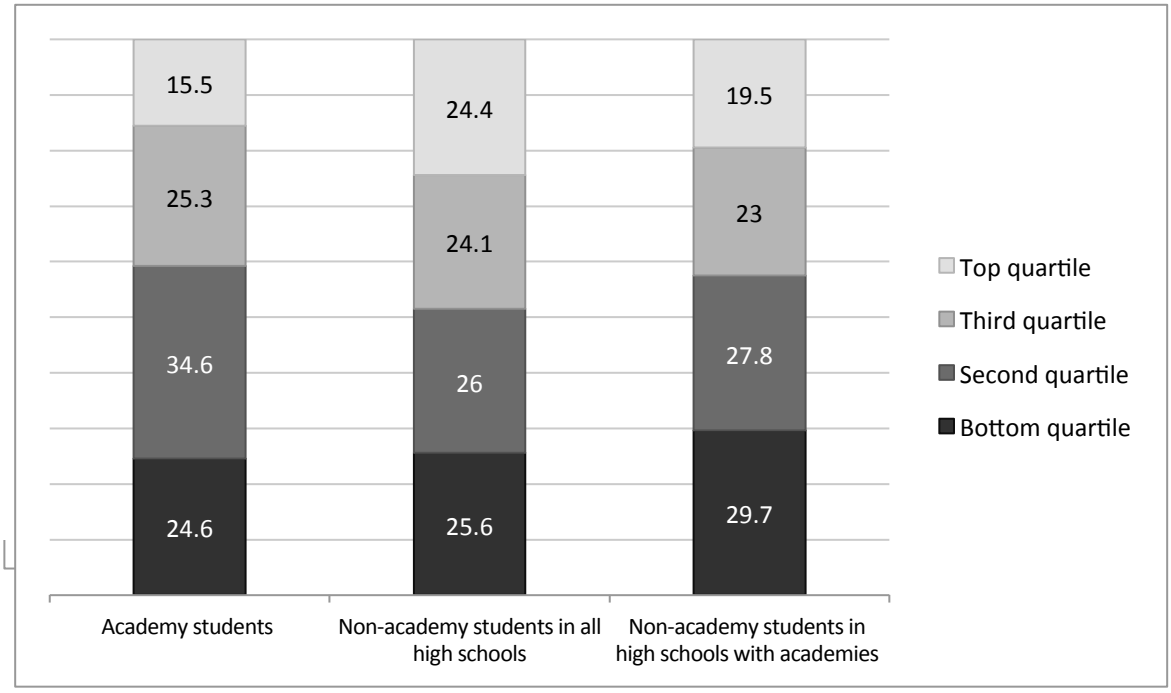


Figure 6: Percent of grade 10 academy and non-academy students in special education



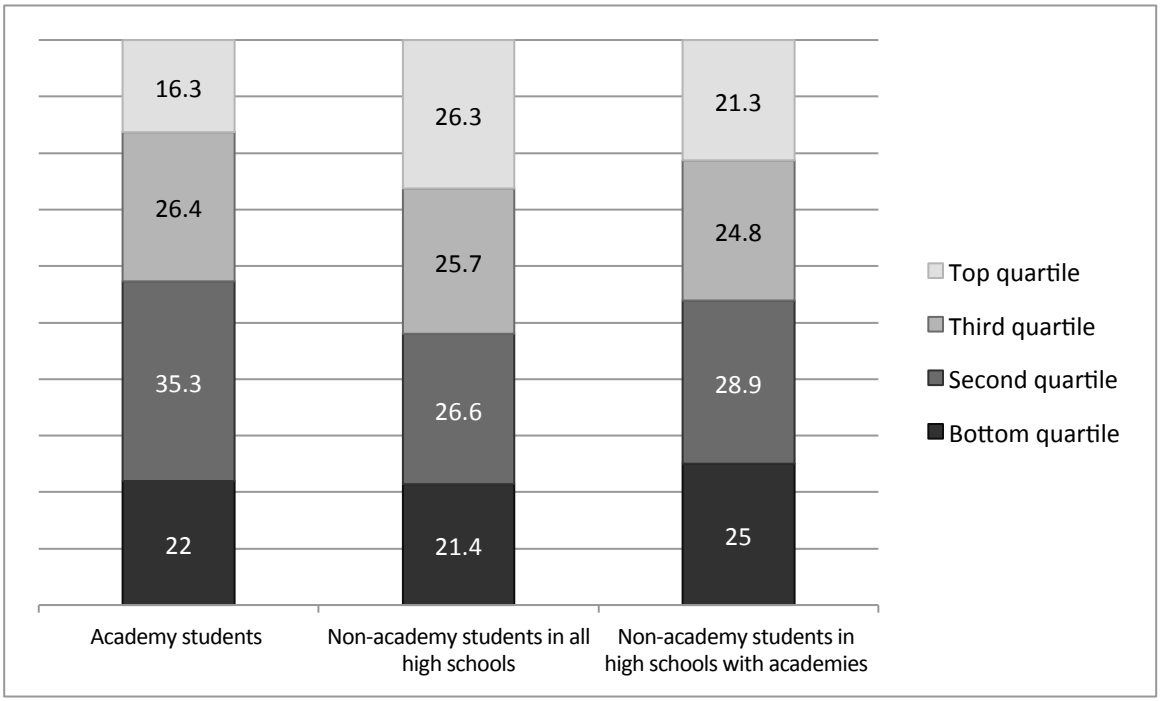
Low test scores in grade 9 are one of the criteria for identifying the "at-risk" students CPAs are required to admit in grade 10. Compared to non-academy students, more academy 10th graders had grade 9 English Language Arts (ELA) scores in the middle two quartiles, according to Figure 7.[4] CPAs enrolled fewer 10th graders whose grade 9 ELA scores were in the bottom quartile, but this is partly attributable to the smaller proportion of Special Education students in CPAs. Figure 8 shows that, when Special Education students are not included in the comparison, the proportion of students in the lowest quartile was larger in CPAs than for all non-academy students, though it was still smaller compared to non-academy students in schools that had academies.

Figure 7: Percent of grade 10 academy and non-academy students by English Language Arts test score quartile in grade 9, all students



[4] The boundary scores defining quartiles were determined from the distribution of grade 9 ELA scale scores for all academy and non-academy 10th graders in all schools.

Figure 8: Percent of grade 10 academy and non-academy students by English Language Arts test score quartile in grade 9, without Special Education students



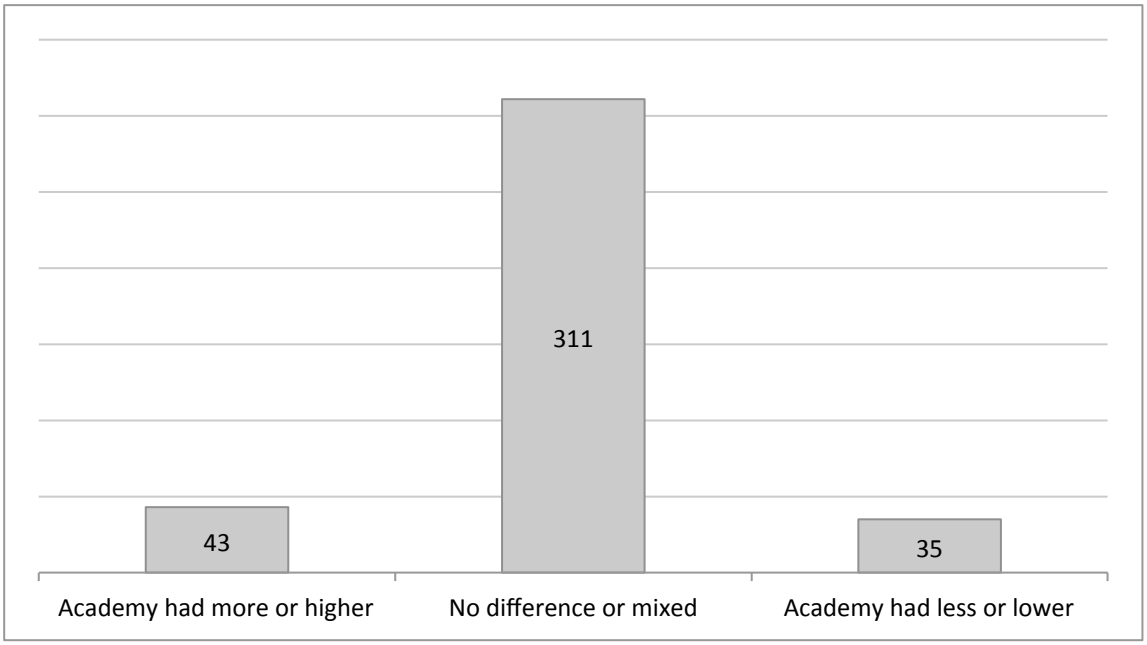
Comparing 10th graders in each academy with non-academy 10th graders at the same school

The preceding figures showed results when grade 10 students from all CPAs were combined and compared with non-academy 10th graders. The following set of figures show results of comparing grade 10 students in each CPA with non-academy 10th graders *at the same school*. This kind of comparison can be useful for guiding improvement of individual CPAs.

For instance, the combined comparison in Figure 1 showed that, overall, 10th graders in CPAs were more likely to be eligible for subsidized lunch, compared to non-academy 10th graders. Accordingly, Figure 9 shows there were 43 individual CPAs where the proportion of 10th graders eligible for subsidized lunch was significantly greater than among non-academy 10th graders at the same school. However, Figure 9 shows that 35 individual CPAs were exceptions to the overall pattern. In these 35 CPAs the proportion of 10th graders eligible for subsidized lunch was significantly *less* than among non-academy 10th graders in the same high school. For the large majority — 311 CPAs — the difference in subsidized lunch eligibility between academy and non-academy 10th graders was not statistically significant.[5]

[5] Tests of statistical significance were conducted separately for each academy. In comparing student characteristics that were measured as proportions, as in Figure 9, a chi-square test was used to gauge statistical significance. When the student characteristic was measured as a mean, as in Figure 17, a t-test was used. The criterion for statistical significance was $p<.05$. In each of these charts, therefore, it would

Figure 9: Number of academies in which the proportion of grade 10 students who were eligible for subsidized lunch was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



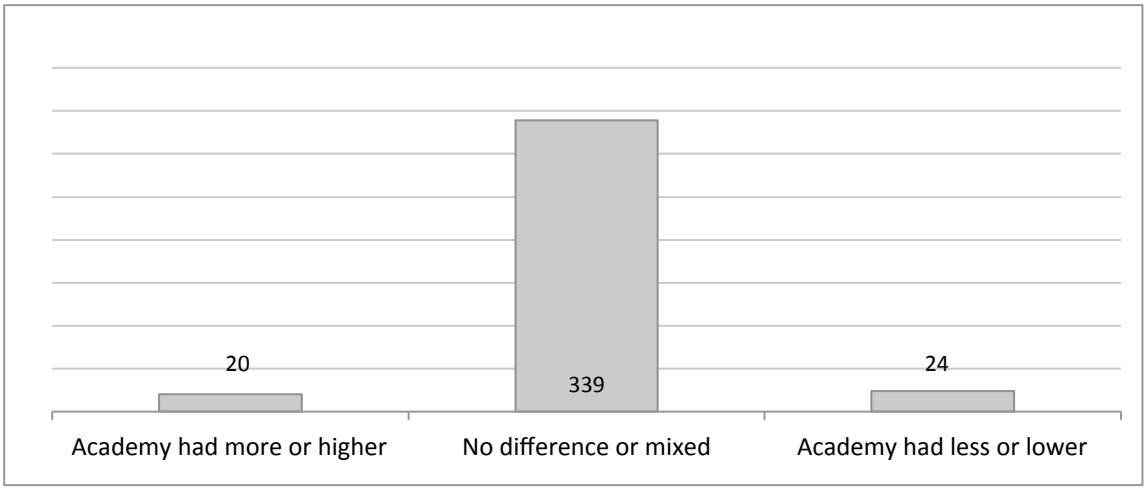
Too few students or no variance = 11[6]

Figure 10 displays a similar pattern with respect to parents' educational attainment. In the great majority of CPAs, parents' education was not significantly different for academy and non-academy students. In 24 CPAs (5 percent of the 383 academies that could be analyzed in this Figure), parents' education was significantly lower for academy than non-academy 10th graders. This is consistent with the mission of CPAs to serve at-risk youth. However, in 20 CPAs parents' education was significantly higher for academy than for non-academy students. Administrators and teachers in these 20 CPAs might want to look into why these academies are enrolling more students of highly educated parents and, if appropriate, make some changes in recruitment procedures.

be expected that 5 percent of the academies would show statistically significant differences just by chance.

[6] "Too few students" means there were fewer than 30 students at this school and grade level for whom information on this characteristic was provided. "No variance" means that all students were reported to be the same with respect to this characteristic. Tests of statistical significance are not appropriate under either of these conditions.

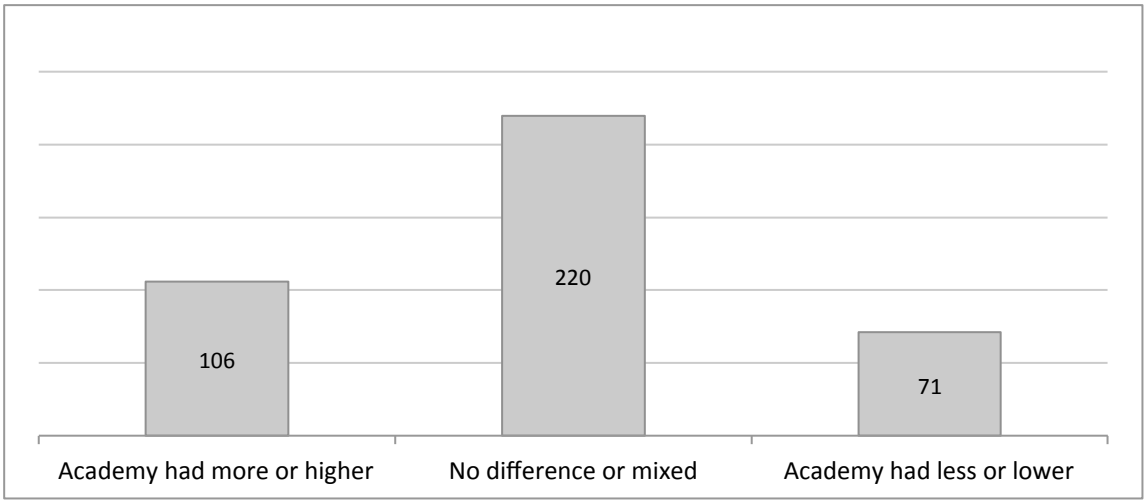
Figure 10: Number of academies in which grade 10 students had parents with higher, not significantly different, or lower levels of education compared to grade 10 non-academy students at the same school



Too few students or no variance: 17

Gender is not one of the "at-risk" characteristics specified in the law. What is interesting about Figure 11 is the relatively large number of CPAs that enrolled either significantly more females (106 academies) or significantly fewer (71 academies), compared to non-academy 10th graders at the same high school. This reflects the fact, as documented in the 2011 *Profile of California Partnership Academies*, that some career fields are still predominantly female (e.g. fashion) or predominantly male (e.g. building and construction). In academies where this gender imbalance is occurring, administrators and teachers may want to consider how they can work toward a more balanced distribution, in accordance with Federal Title IX guidelines.

Figure 11: Number of academies in which the proportion of grade 10 students who were female was higher, not significantly different, or lower than among grade 10 non-academy students at the same school

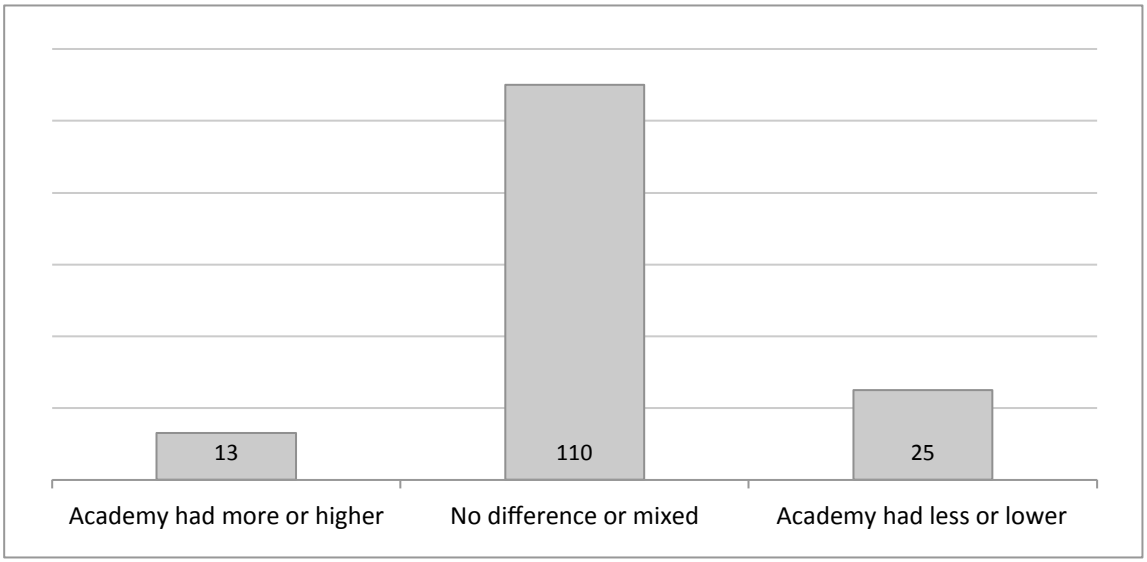


Too few students or no variance: 3

Figures 12 through 16 display differences in enrollment of students from the largest racial and ethnic groups. Consistent with the overall percentages in Figure 4, the numbers of CPAs with significantly larger shares of Latino and Filipino students exceed the numbers of CPAs with significantly smaller shares of Latino and Filipino students. And the number of CPAs with significantly smaller proportions of Asian students exceeds the number with larger proportions of Asian students —- also consistent with Figure 4. However, a considerable number of academies show a different pattern than the overall percentages in Figure 4. For instance, Figure 14 shows 41 CPAs enrolled significantly lower proportions of Latino students, compared to non-academy students at the same school. This illustrates how comparing academy and non-academy students one school at a time can give different, and potentially more useful, information than simply comparing the overall numbers for the state.

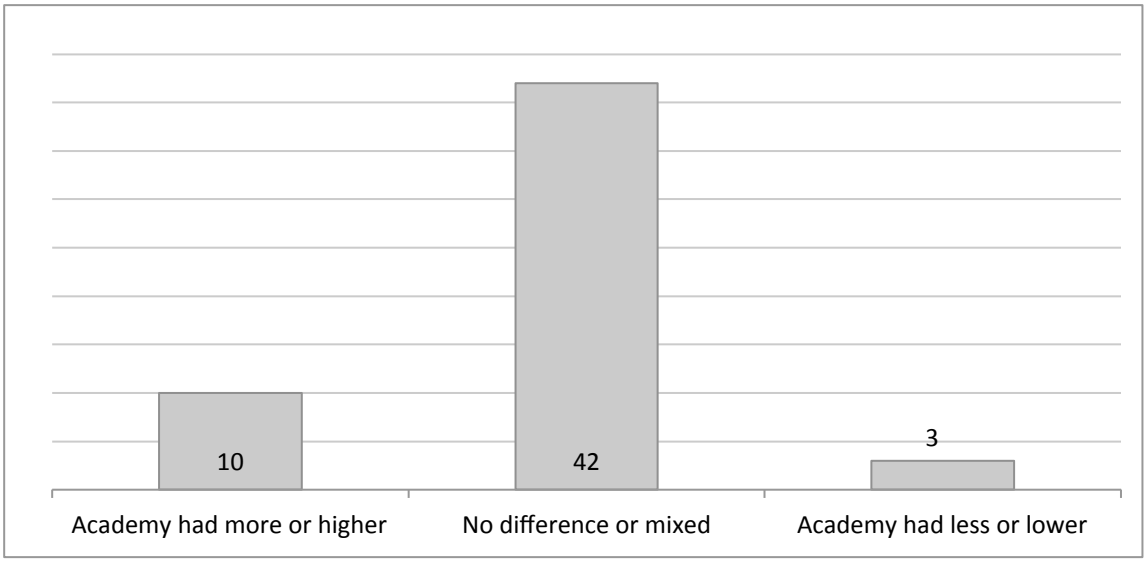
In two instances, comparing individual academies produces the opposite result from comparing all academies combined. The overall comparisons in Figure 4 showed CPAs generally enrolling a larger fraction of African American students, and a smaller fraction of white students. However, Figure 15 shows there were 18 CPAs where the proportion of African American 10th graders was significantly *less* than among non-academy 10th graders at the same school. Only 8 CPAs had significantly greater proportions of African American students. Similarly, Figure 16 shows the number of CPAs with significantly larger proportions of white students exceeded the number with significantly smaller proportions of whites —- in contrast to the overall comparison in Figure 4. In both cases, the seeming inconsistency could easily be explained by a somewhat larger fraction of African Americans, and a somewhat smaller fraction of whites, in the large group of CPAs where the difference between academy and non-academy students was not statistically significant. The point is that patterns within individual schools can be very different from the overall pattern.

Figure 12: Number of academies in which the proportion of grade 10 students who were Asian was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



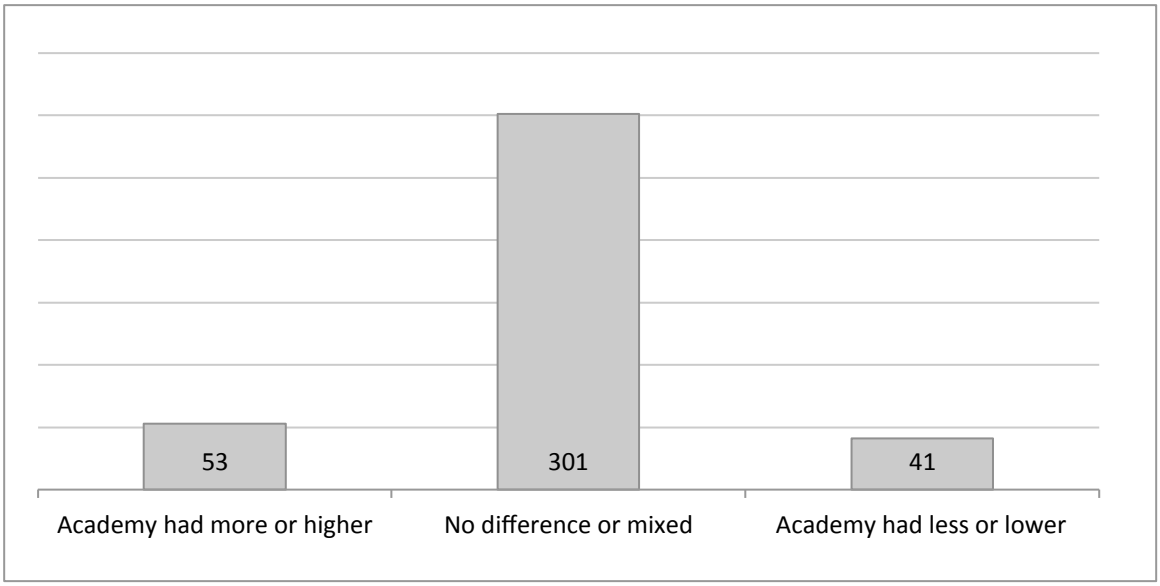
Too few students or no variance: 252

Figure 13: Number of academies in which the proportion of grade 10 students who were Filipino was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



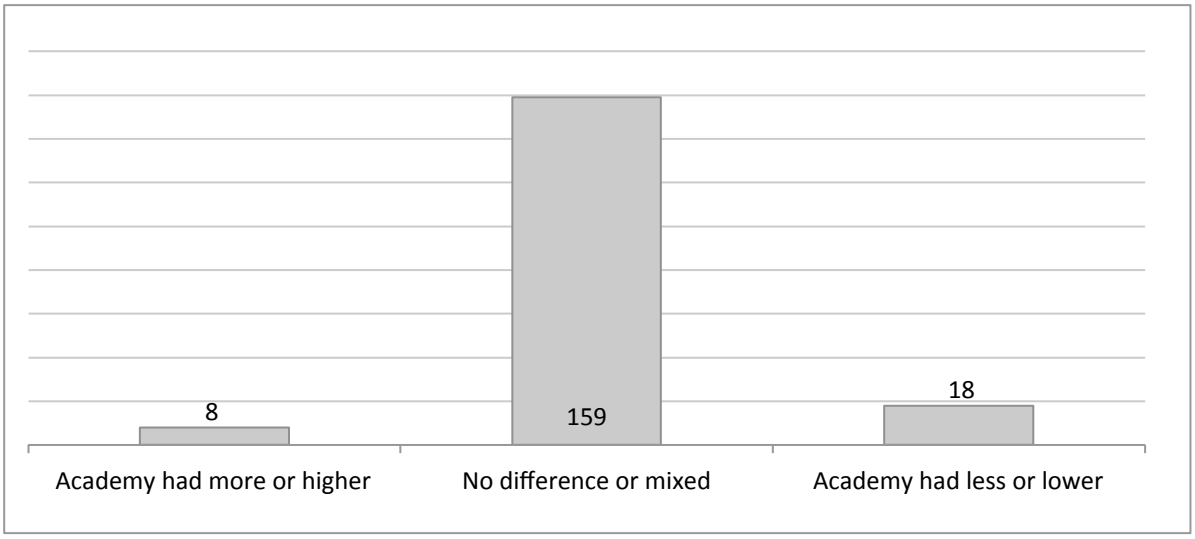
Too few students or no variance: 345

Figure 14: Number of academies in which the proportion of grade 10 students who were Latino was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



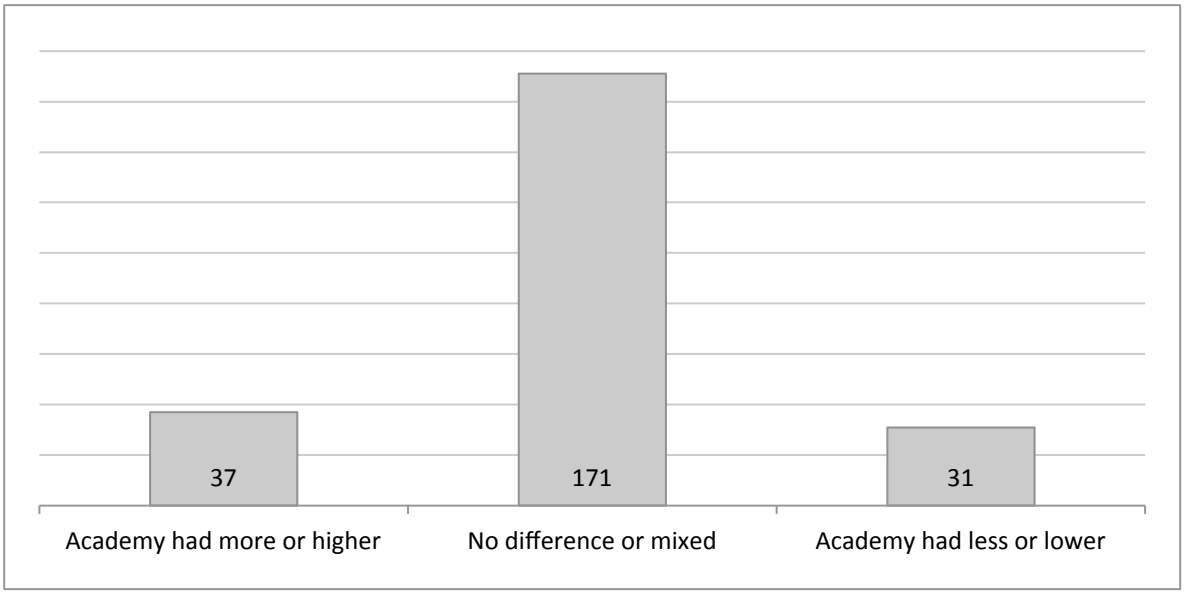
Too few students or no variance: 5

Figure 15: Number of academies in which the proportion of grade 10 students who were African American was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



Too few students or no variance: 215

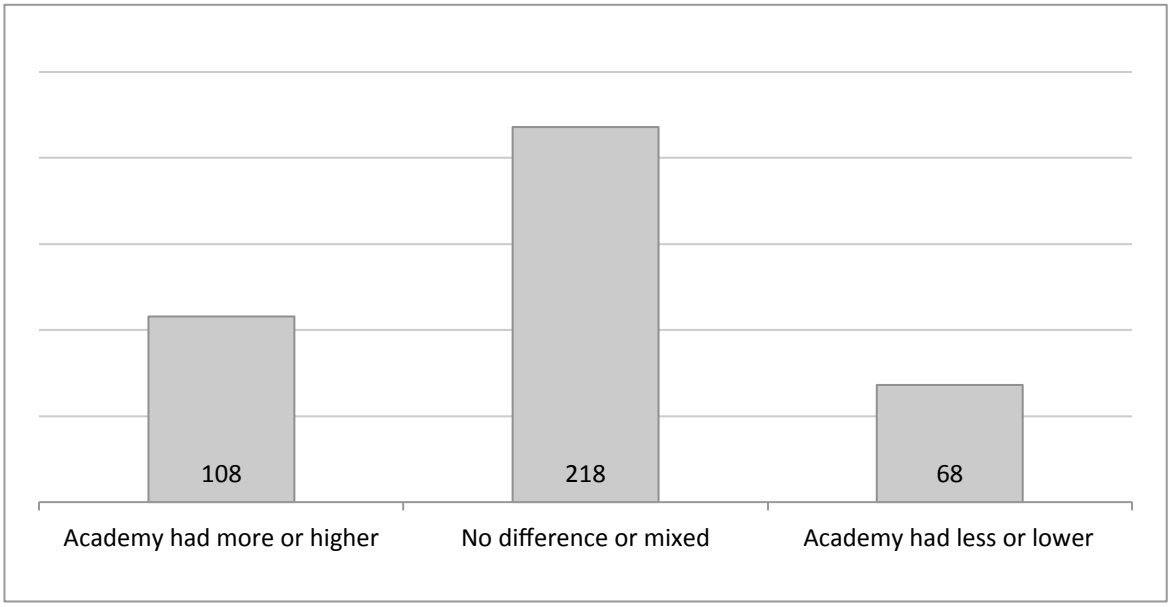
Figure 16: Number of academies in which the proportion of grade 10 students who were white was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



Too few students or no variance: 161

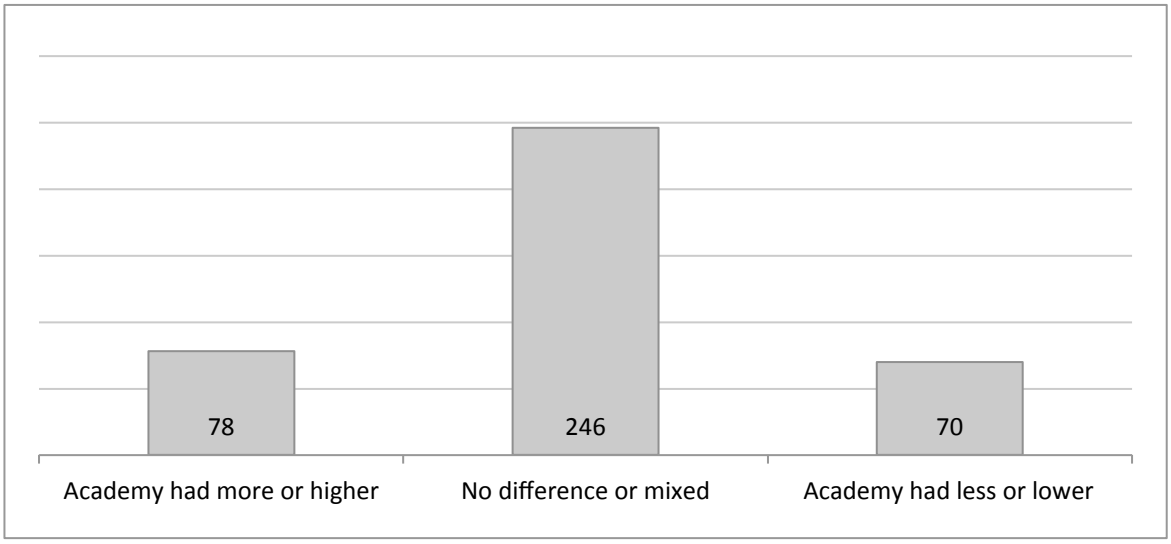
With respect to grade 9 test scores in English Language Arts, Figure 17 shows that more CPAs had incoming 10th graders with significantly higher average grade 9 test scores, compared to non-academy 10th graders in the same school, even when Special Education students are not included in the analysis. Figure 18 shows a similar but less pronounced result for grade 9 test scores in math. As with the other student characteristics, in most CPAs the test score difference between academy and non-academy students was not statistically significant. But the numbers of CPAs with significant differences in Figures 17 and 18 is unusually large — much more than the 5 percent of the total that would be expected by chance. This suggests that some kind of polarization seems to be happening in terms of test scores. A large number of CPAs are enrolling 10th graders who had either significantly higher or lower grade 9 test scores compared to non-academy students at the same school. Since CPAs are intended to enroll students with low prior test scores, it is of some concern that a considerable number of CPAs are doing just the opposite. Again, this is an issue that could be taken up by local administrators and teachers.

Figure 17: Number of academies in which grade 10 students had higher, not significantly different, or lower mean test scores in English Language Arts in grade 9, compared to grade 10 non-academy students at the same school, without special education students



Too few students or no variance: 6

Figure 18: Number of academies in which grade 10 students had higher, not significantly different, or lower mean test scores in mathematics in grade 9, compared to grade 10 non-academy students at the same school, without special education students



Too few students or no variance: 6

WHO STAYS?

Comparing Characteristics of Grade 11 Academy and Non-Academy Students

To get an indication of whether certain kinds of students are more likely to continue from grade 10 to grade 11, we compared academy and non-academy 11th graders. This is not a truly longitudinal analysis, because the 11th graders analyzed here are a different cohort of students than the 10th graders. They are not even from exactly the same set of CPAs, because some of the academies with 10th graders were new in 2009-10 and did not yet enroll 11th graders.

As with the analysis of grade 10 students, we report two kinds of comparison: first with all academies combined, then for individual academies.

Comparing 11th grade academy and non-academy students in all academies combined

Here we compare the characteristics of all CPA students in grade 11 (n=14,292) with all grade 11 non-academy students in the state (n=463,768), and with the subset of grade 11 non-academy students who were in high schools that had CPAs (n=111,648).

Figures 19-26 show that the differences between academy and non-academy students in grade 11 are similar to the differences in Figures 1-8 for grade 10. CPAs are located in schools where parents of 11th graders have lower education and income, and more 11th graders are Latino.

Even within these schools that have CPAs, the academy 11th graders have parents with lower education and income, compared with non-academy 11th graders, and larger proportions of the academy students are Latino and Filipino. These differences between academy and non-academy students in schools that have CPAs are all somewhat bigger in grade 11 than in grade 10. Although this is not a true longitudinal comparison, it suggests that academy students whose parents have low income or education, or who are Latino or Filipino, have at least as good a chance of moving from grade 10 to grade 11 as non-academy students do.

Within schools that have CPAs, academy 11th graders include more females, compared to non-academy 11th graders. Academy students are also more likely ever to have been classified as English Language Learners but, in grade 11 as in grade 10, the academies over-represent students who have been reclassified as Fluent English Proficient, and under-represent students who remain classified as English Language Learners. Special Education students also are still under-represented in academies at grade 11, but to a smaller degree than at grade 10. The pattern of grade 9 test scores in English Language Arts among 11th graders is similar to the pattern among 10th graders: academies over-represent students in the middle two quartiles, and have lower proportions of students who scored either in the top of bottom quartile in grade 9.

Figure 19: Percent of grade 11 academy and non-academy students eligible for subsidized lunch

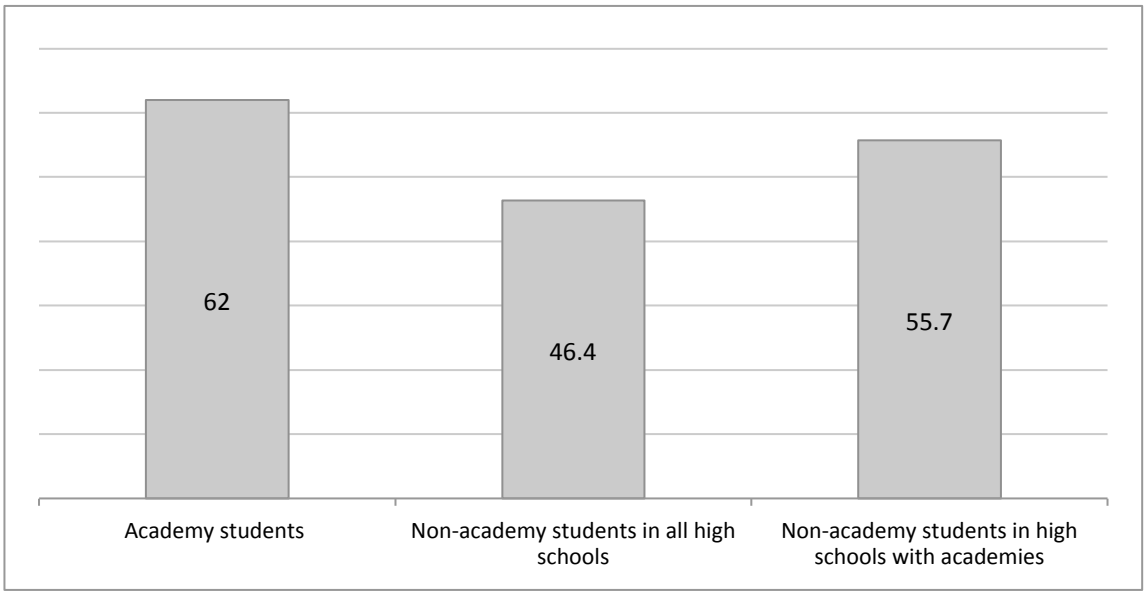


Figure 20: Percent of grade 11 academy and non-academy students by parents' education

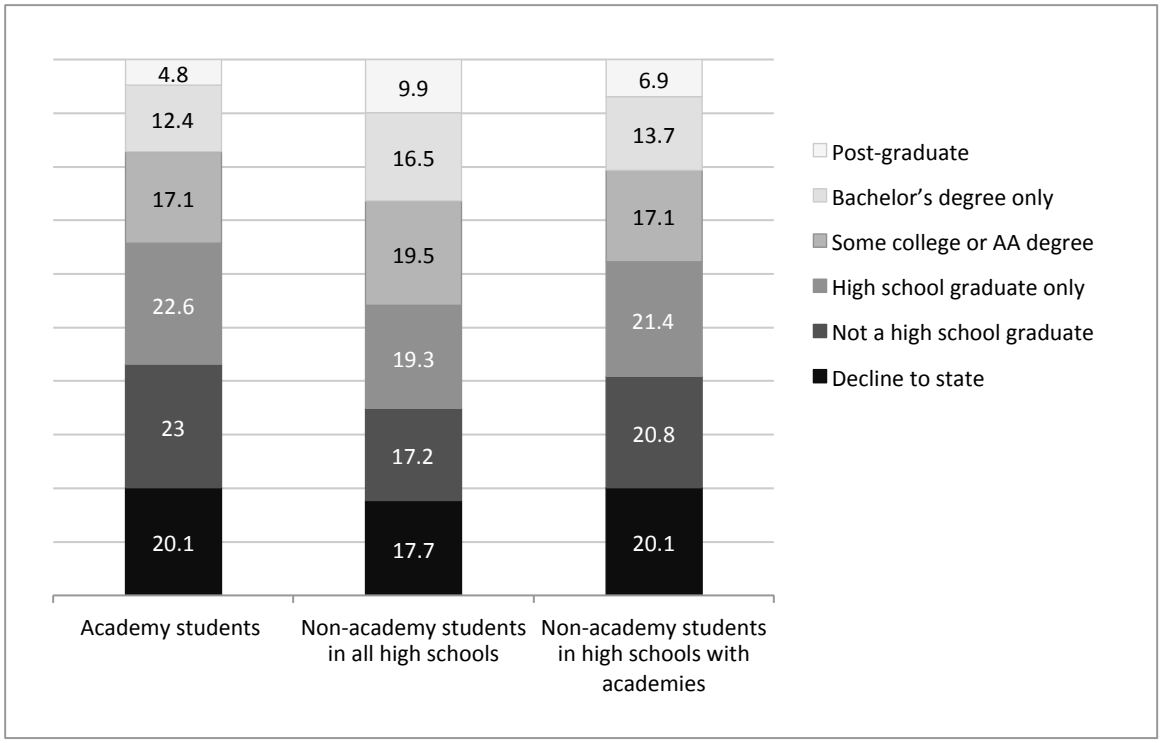


Figure 21: Percent of females among grade 11 academy and non-academy students

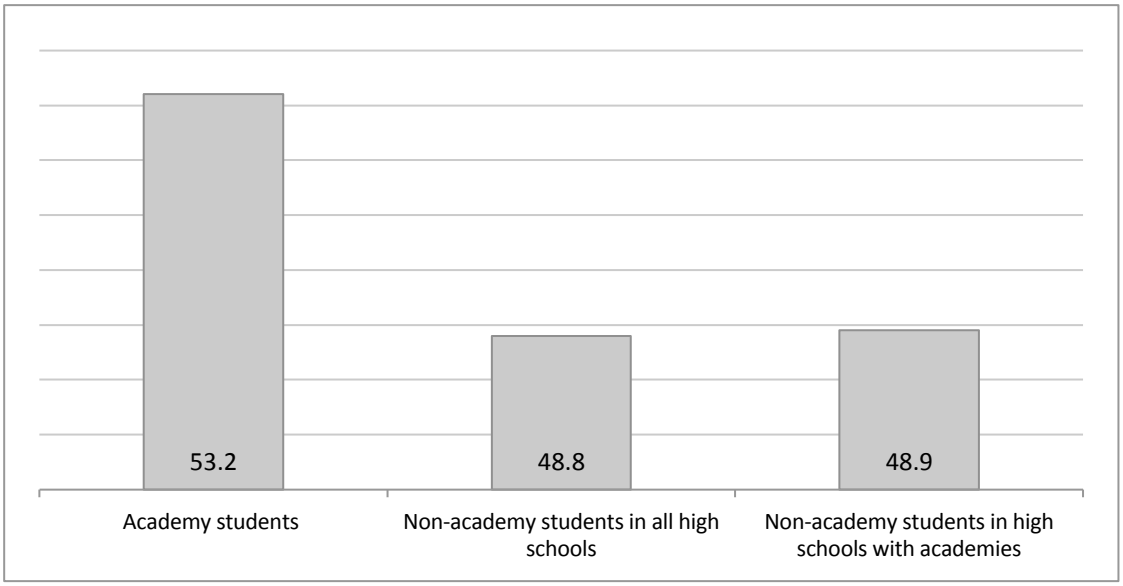


Figure 22: Percent of grade 11 academy and non-academy students by race or ethnicity

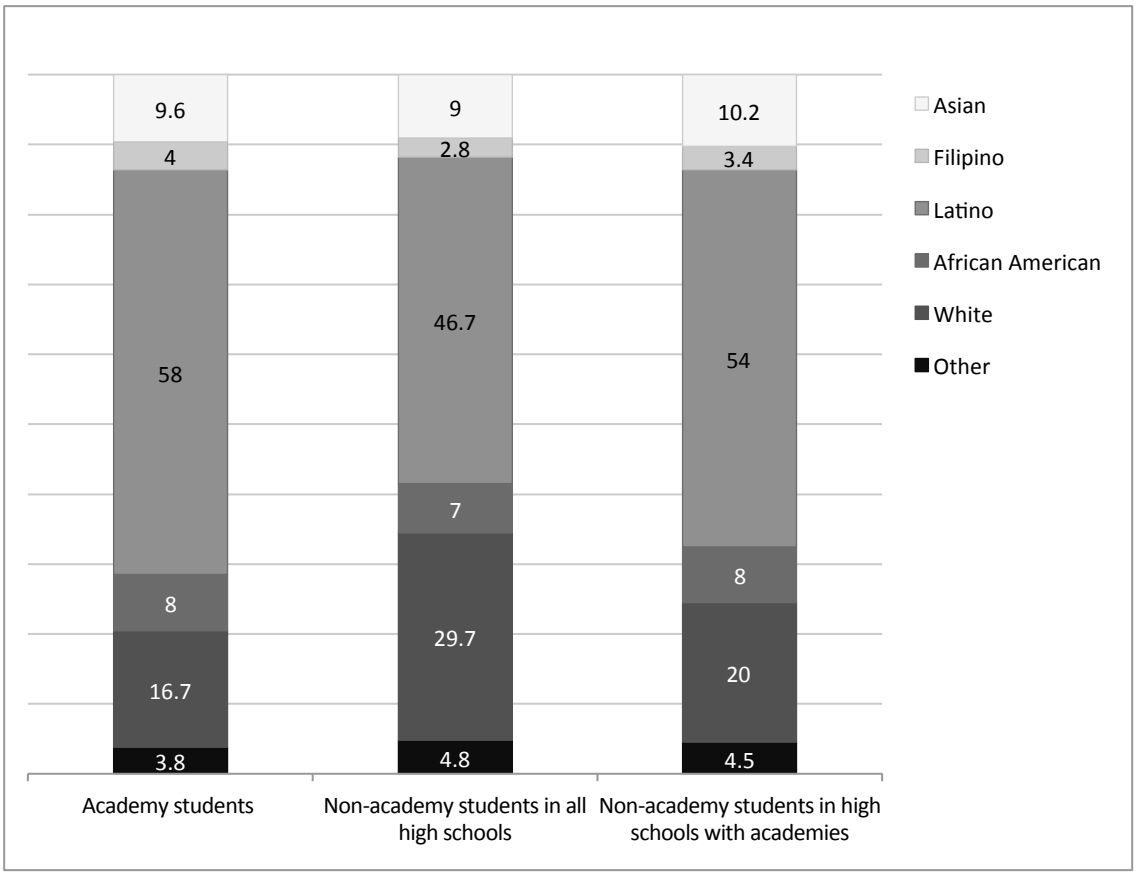


Figure 23: Percent of grade 11 academy and non-academy students ever classified as English Language Learners

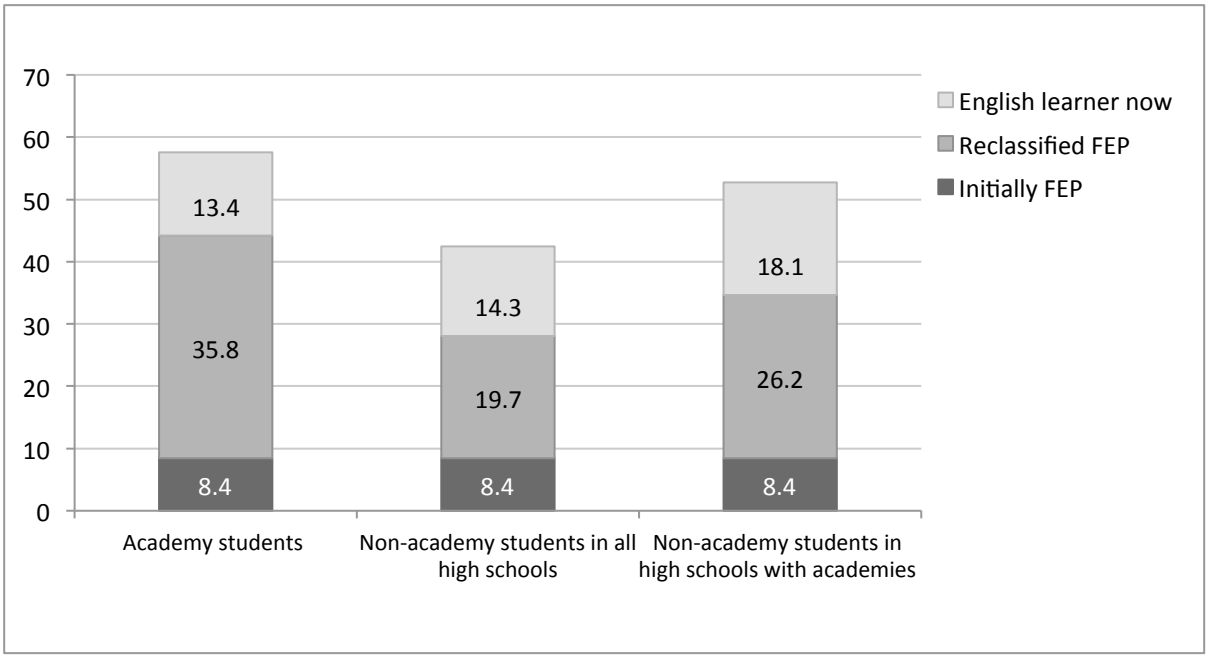


Figure 24: Percent of grade 11 academy and non-academy students in special education

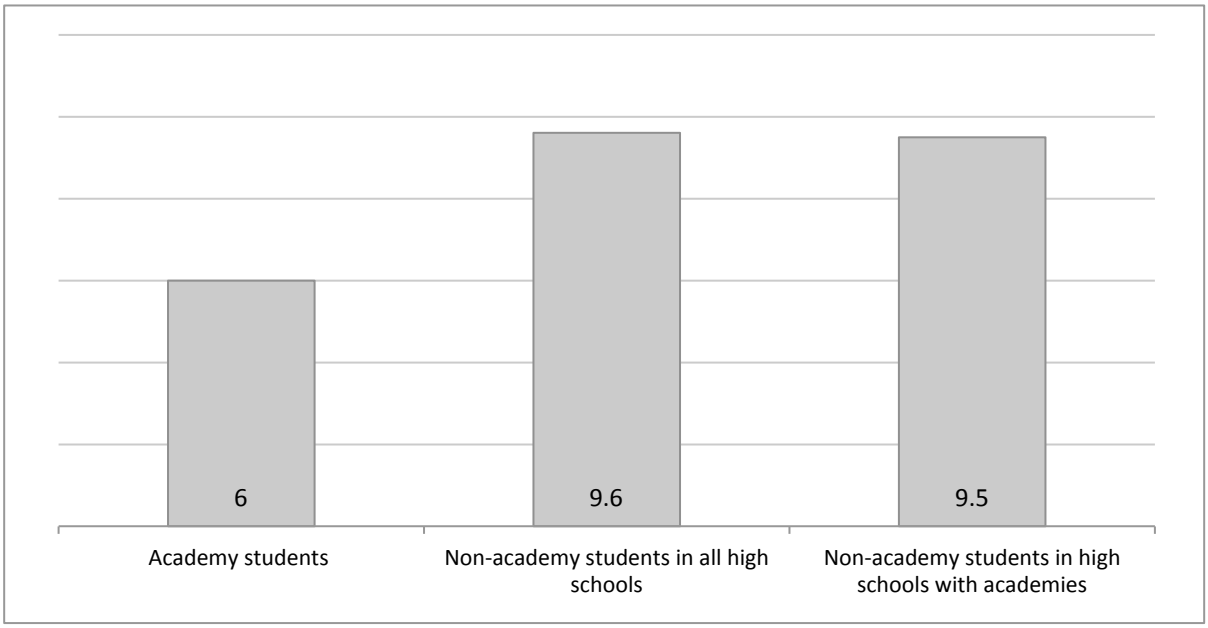


Figure 25: Percent of grade 11 academy and non-academy students by English Language Arts test score quartile in grade 9, all students

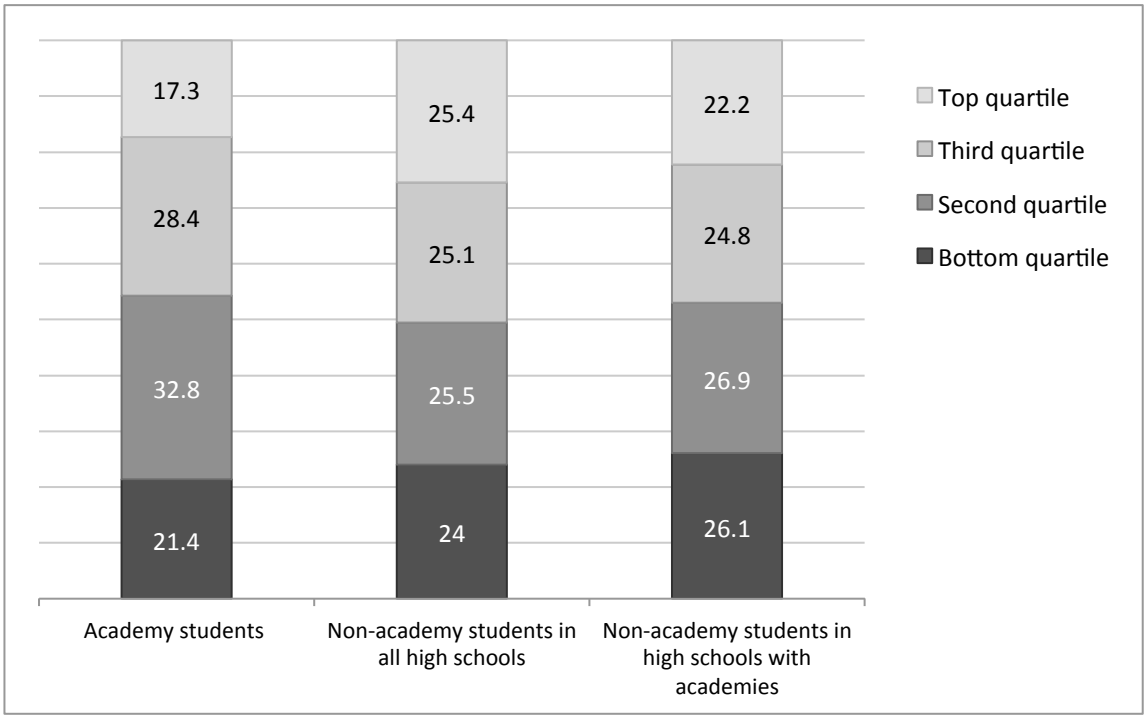
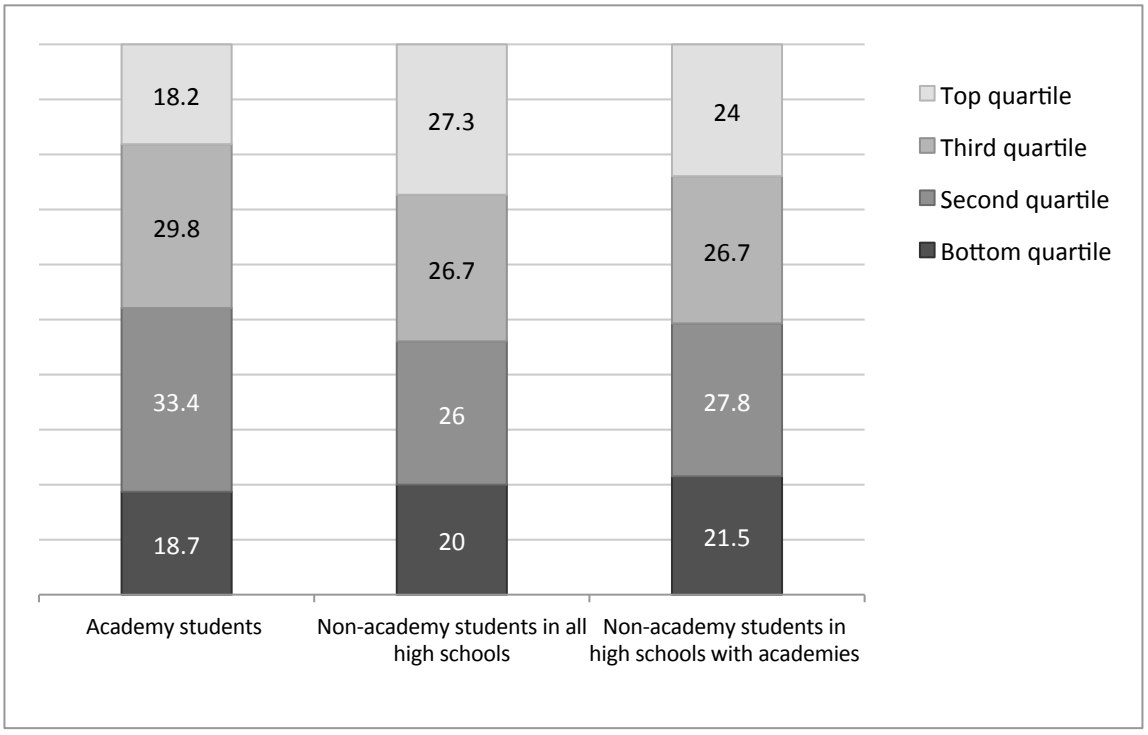


Figure 26: Percent of grade 11 academy and non-academy students by English Language Arts test score quartile in grade 9, without special education students



Comparing 11th graders in each academy with non-academy 11th graders at the same school

The preceding figures showed results when grade 11 students from all CPAs were combined and compared with non-academy 11th graders. The following set of figures show results of comparing grade 11 students in each CPA with non-academy 11th graders at the same school.

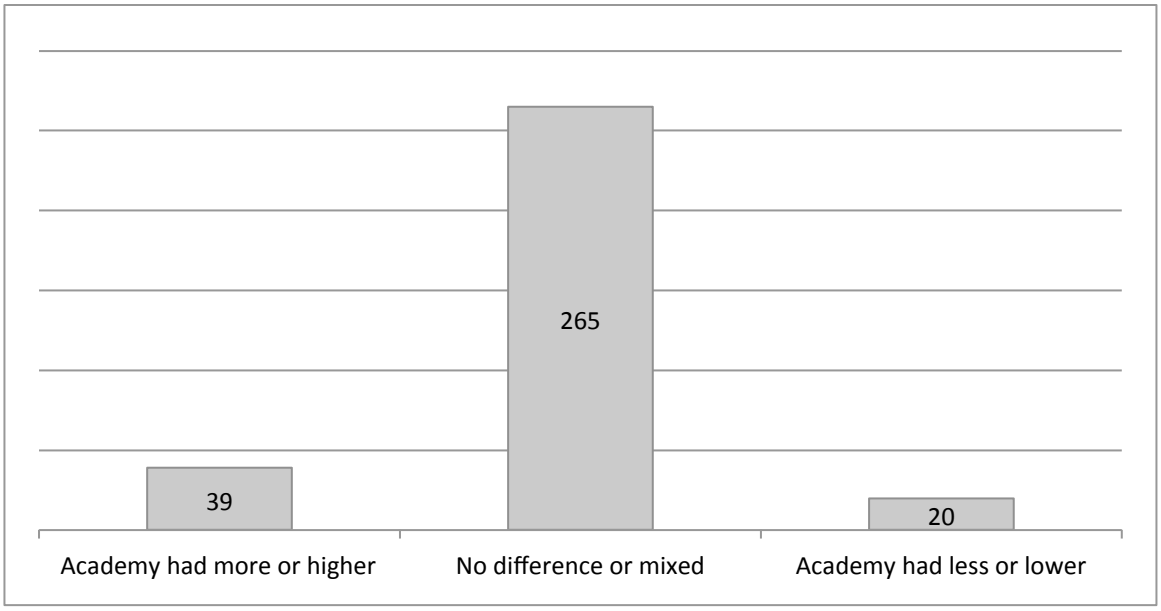
Generally, Figures 27-36 show similar patterns in grade 11 as Figures 9-18 depicted in grade 10. In most CPAs, the differences between academy and non-academy students at the same school were not statistically significant. Again the differences that are significant more often show academies enrolling more 11th graders whose parents have low education and income, and more students who are Latino or Filipino. On each of these characteristics, the preponderance is greater in grade 11 than in grade 10.

For instance, at grade 11, Figure 27 shows academies that had significantly more low-income students (as indicated by eligibility for free or subsidized lunch), outnumbered academies that had significantly fewer low-income students, by 39 to 20. In grade 10, Figure 9 showed the corresponding difference was 43 to 35. This indicates that CPAs were fulfilling the intent of the law to a somewhat greater degree in grade 11 as in grade 10. And in the 20 academies that significantly under-represented low-income students in grade 11, administrators and teachers could seek to find out why, and take appropriate corrective action.

Special Education students were still significantly under-represented in CPAs in grade 11 more often than they were over-represented (by a margin of 47 to 8, as shown in Appendix Table 4), but this was less than the margin of 70 to 10 in grade 10 (Appendix Table 2). And, when Special Education students are not included in the analysis, Figures 35 and 36 show a greater tendency in grade 11 than in grade 10 for CPAs to over-represent students who had low test scores in grade 9, before they entered the academy.

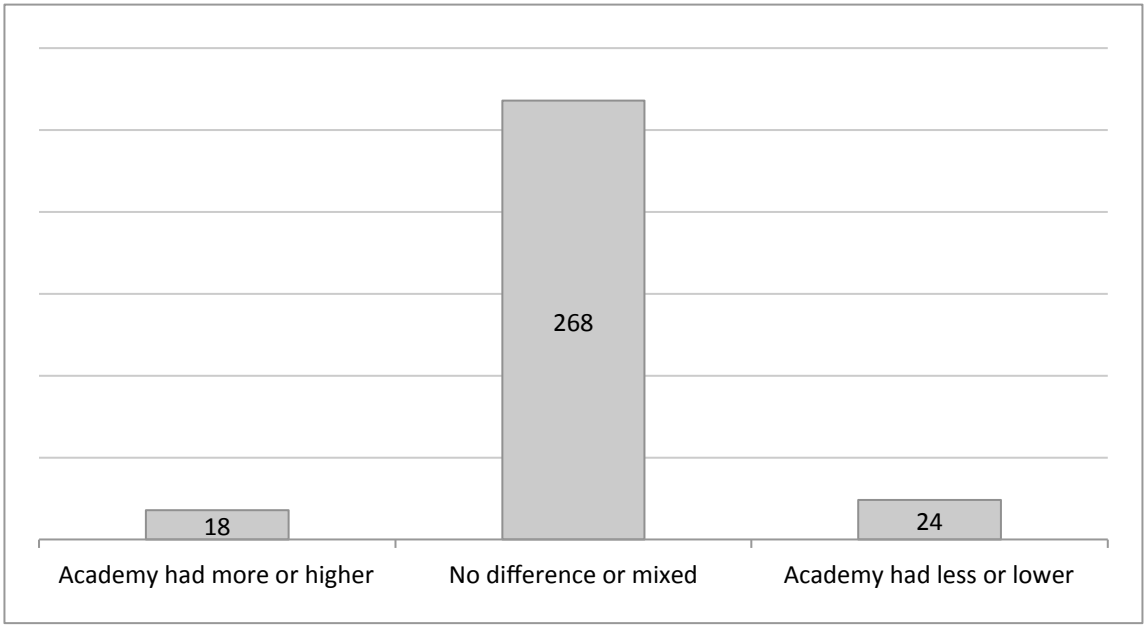
Generally, these comparisons show CPAs were more likely to enroll challenging or under-served populations of students in grade 11 than in grade 10. The only exception is that African American students were more often under-represented in CPAs in grade 11 than in grade 10. Again, it is important to recall that we are comparing two different cohorts of students, one in grade 10 and the other in grade 11, so this is not a truly longitudinal analysis.

Figure 27: Number of academies in which the proportion of grade 11 students who were eligible for subsidized lunch was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



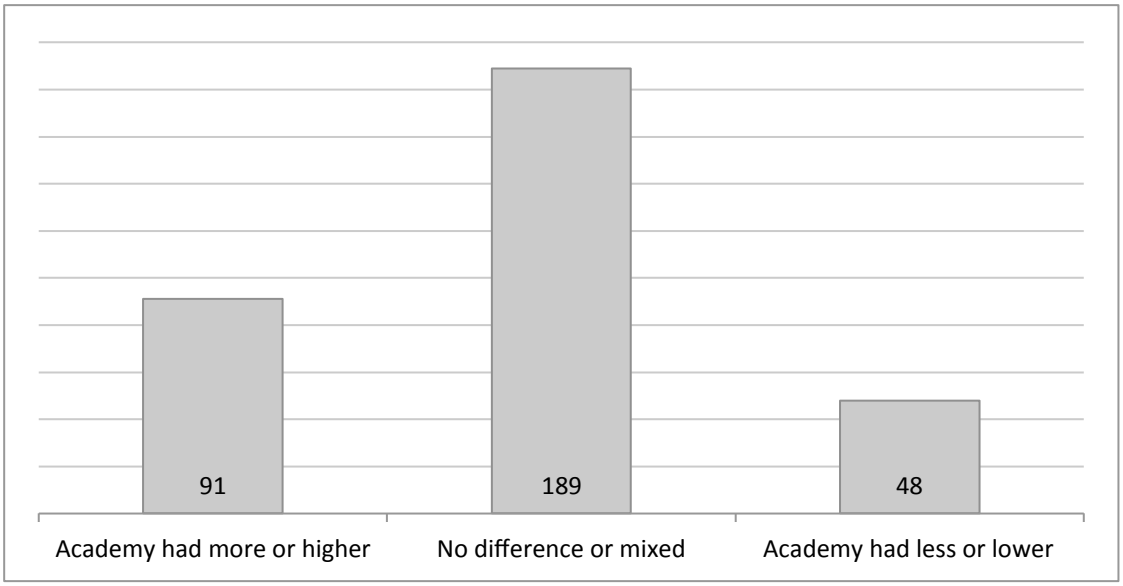
Too few students or no variance=7

Figure 28: Number of academies in which grade 11 students had parents with higher, not significantly different, or lower levels of education compared to grade 10 non-academy students at the same school



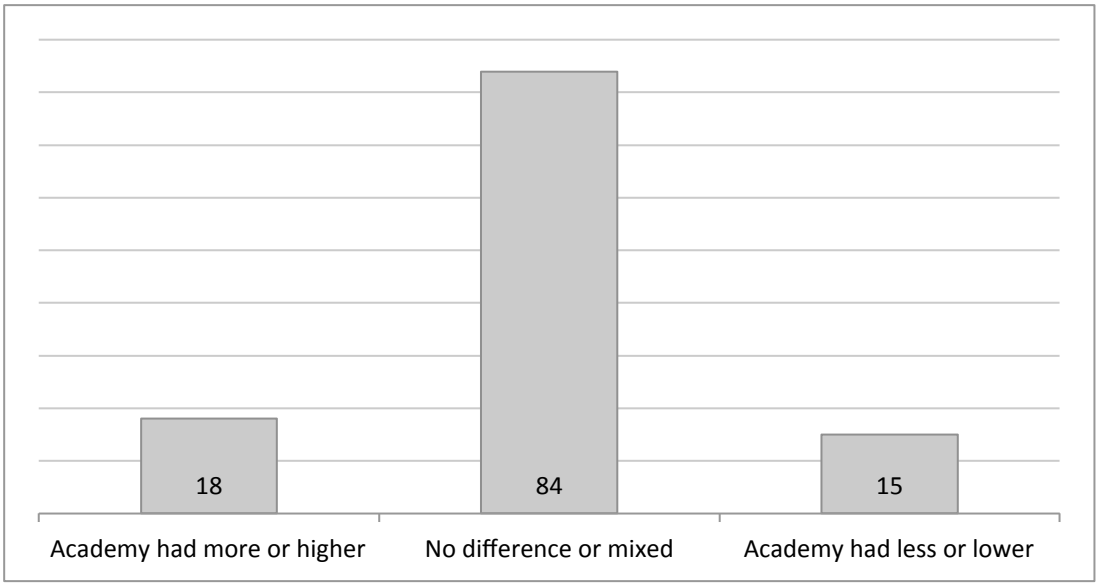
Too few students or no variance: 21

Figure 29: Number of academies in which the proportion of grade 11 students who were female was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



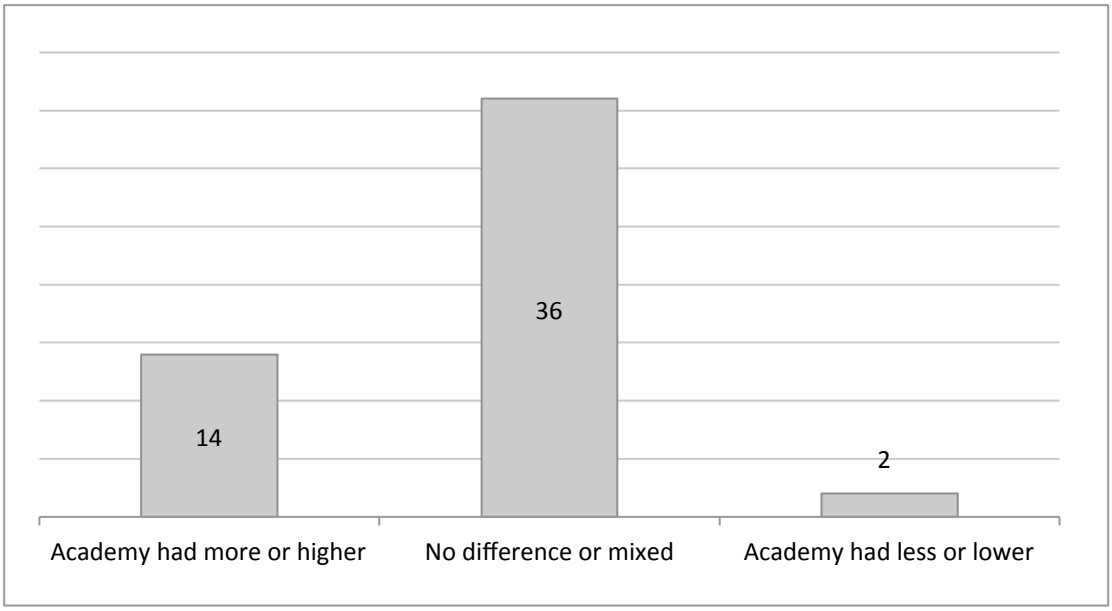
Too few students or no variance: 3

Figure 30: Number of academies in which the proportion of grade 11 students who were Asian was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



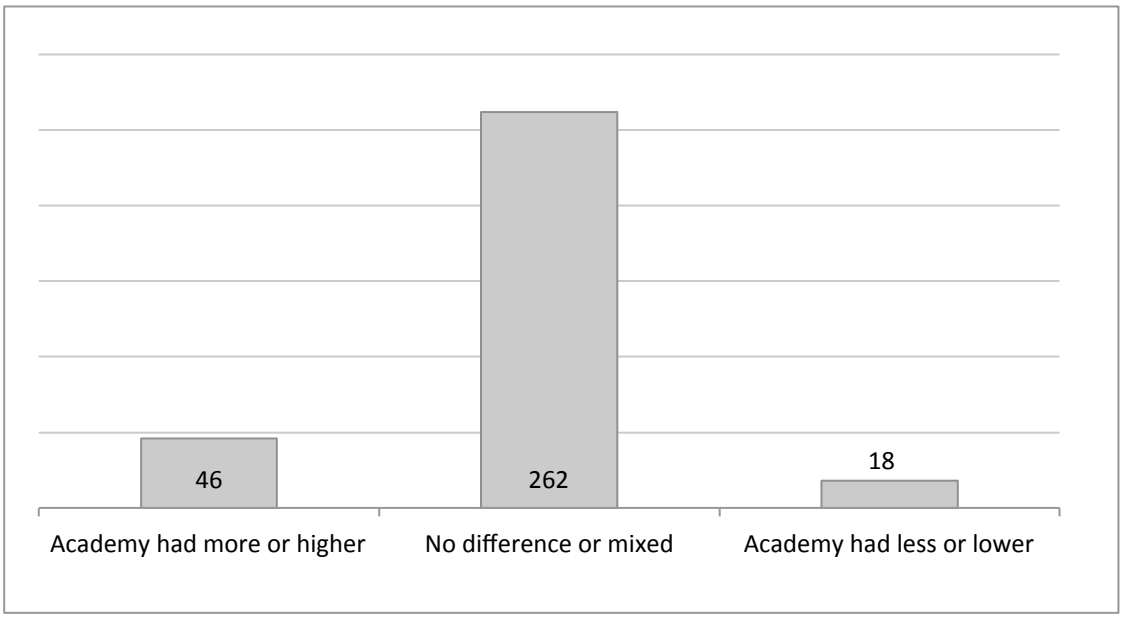
Too few students or no variance: 214

Figure 31: Number of academies in which the proportion of grade 11 students who were Filipino was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



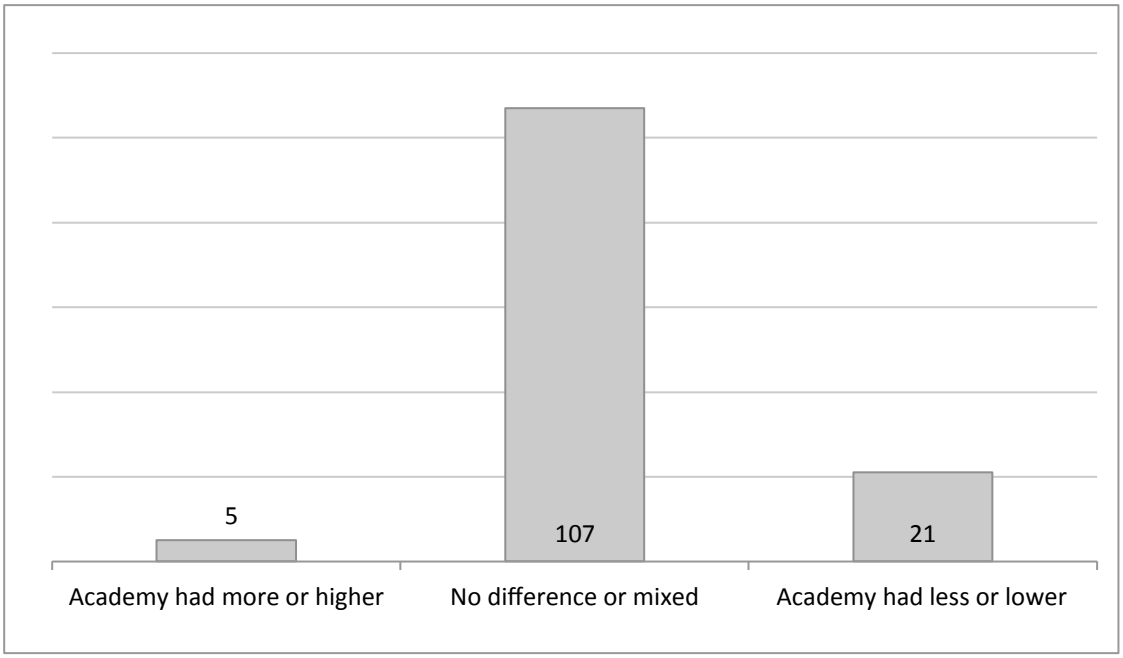
Too few students or no variance: 279

Figure 32: Number of academies in which the proportion of grade 11 students who were Latino was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



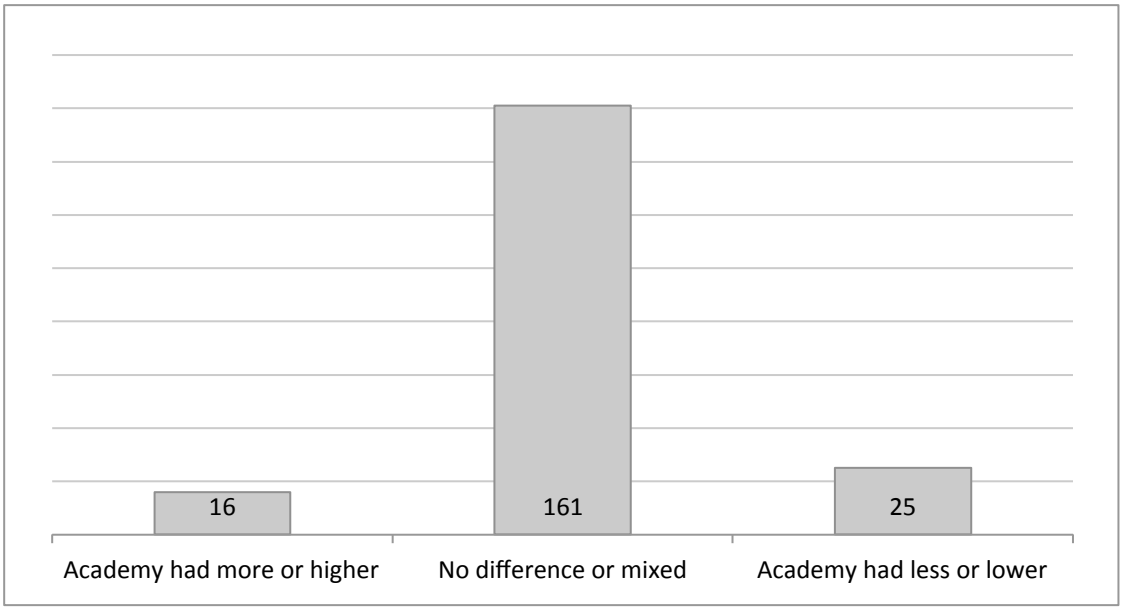
Too few students or no variance: 5

Figure 33: Number of academies in which the proportion of grade 11 students who were African American was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



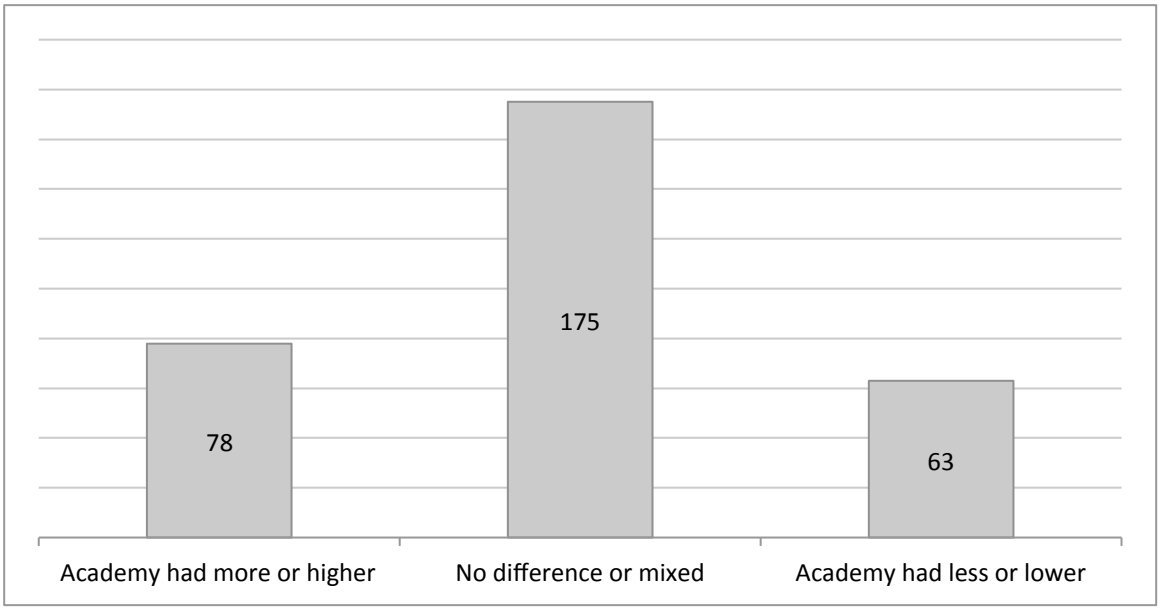
Too few students or no variance: 198

Figure 34: Number of academies in which the proportion of grade 11 students who were white was higher, not significantly different, or lower than among grade 10 non-academy students at the same school



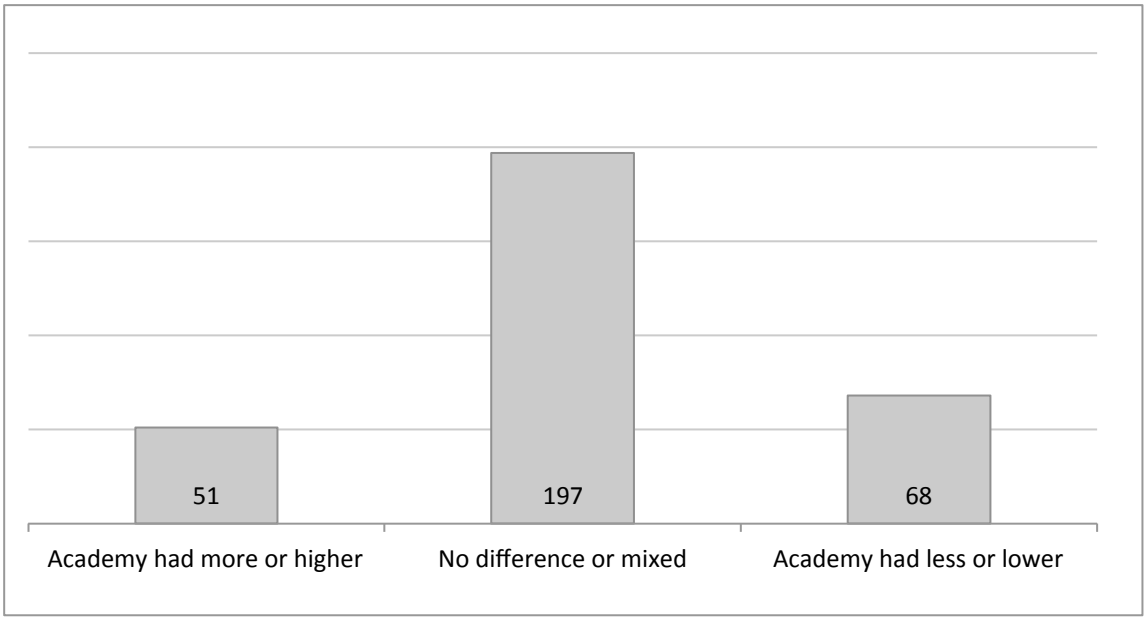
Too few or no variance: 129

Figure 35: Number of academies in which grade 11 students had higher, not significantly different, or lower mean test scores in English Language Arts in grade 9, compared to grade 10 non-academy students at the same school, without special education students



Too few or no variance: 15

Figure 36: Number of academies in which grade 11 students had higher, not significantly different, or lower mean test scores in mathematics in grade 9, compared to grade 10 non-academy students at the same school, without special education students



Too few or no variance: 15

DOES PERFORMANCE IMPROVE?

Comparing Performance of Academy and Non-Academy Students

The question whether students' performance improves also can and should be answered for each academy. Table 1 provides an example of how this can be done, using 2010 scale scores on California Standards Tests. A separate regression analysis was run for each school and grade level. Predictors of 2010 scores included test scores in the same subject for 2009 and 2008, the individual student characteristics listed in Appendix Tables A-1 and A-3, and whether a student was in an academy (or which academy, if the school had more than one). The coefficient on the academy variable indicates whether academy students' average score was higher, lower, or not significantly different from non-academy students' score, taking all the other predictors into account.

It is important to emphasize that these coefficients may not give an accurate indication of whether or how much academies cause students' test scores to change. The reason is that academy students may differ from non-academy students in ways that are not measured in the data. For instance, it is possible that students in some academies have higher levels of motivation than non-academy students. In other academies, the academy students may have lower levels of motivation than non-academy students. If motivation affects test scores, and if the differences in motivation were present before students enrolled in academies, these unmeasured pre-existing differences in motivation would bias the academy coefficient in the regressions. The regression coefficient then would overstate or understate the true causal impact of the academy on test scores.

Table 1 shows most of the academy coefficients were not statistically significant. This is consistent with previous studies.

Again there is important variation. Some academies show significant positive coefficients, and some are significantly negative. Results for a single year are not conclusive. But compiling this information year after year, and including other outcomes in addition to test scores —– such as attendance, credits earned, grades, behavior, and promotion to the next grade level or graduation from grade 12 —– can be very helpful in guiding the continuous improvement of academies.

Table 1: Regression coefficients predicting 2010 test scores

Number of academies with significant and non-significant coefficients

Test and grade level	Number of academies where coefficient is		
	Positive	Not significant	Negative
English Language Arts, grade 10	33	331	17
English Language Arts, grade 11	9	274	22
Algebra I, grade 10	21	306	15
Algebra I, grade 11	12	152	5
Geometry, grade 10	25	324	27
Geometry, grade 11	11	269	8
Algebra II, grade 10	12	332	17
Algebra II, grade 11	18	268	14
Summative math, grade 11	5	261	10

INFORMATION TO GUIDE IMPROVEMENT OF INDIVIDUAL ACADEMIES

Academies vary a great deal in who enrolls, who stays, and whether performance improves. As the number of academies and Linked Learning pathways expands, it becomes increasingly important to monitor each program on an ongoing basis. Figure 37 shows how the information in this report can be summarized in an accessible way for an individual academy. Districts and schools can use this kind of profile to help guide continuous improvement.

Figure 37: Sample profile for an individual pathway, 2009-10

Academy of Construction, Manufacturing, and Engineering (ACME), Mount Diablo High School

Key: compared to non-academy students at same school and grade level,

↑ indicates pathway had significantly more

↓ indicates pathway had significantly less

Blank indicates no significant difference between pathway and non-academy students.

Student characteristic	Grade 10	Grade 11
Female	↓	↓
Parent education		↓
Subsidized lunch eligible	↑	↑
Ever classified ELL		↑
Special ed.		
Race or ethnicity		
American Indian		
Asian		
Pacific Islander		
Filipino		
Latino	↑	↑
African American		
White		
Two or more		
Grade 9 test scores		
ELA performance level		
ELA scale score		
Math performance level	↓	
Math scale score	↓	
Change in test scores, 2009-10		
English Language Arts (ELA)		↑
Algebra 1		
Geometry		
Algebra 2		
Summative Math	N.A.	

REFERENCES

Bradby, D., Dayton, C., Hanna, T., & Malloy, A. (2007). *A Profile of the California Partnership Academies, 2004-2005*. Berkeley, CA: ConnectEd, and Career Academy Support Network (Graduate School of Education, University of California). http://casn.berkeley.edu/resource_files/profile_of_the_cpas.pdf

Kemple, J.J. (2008). *Career Academies: Long-Term Impacts on Labor Market Outcomes, Educational Attainment, and Transitions to Adulthood.* New York: MDRC.

Maxwell, N.L. (2001). "Step to College: Moving from the high school career academy through the four-year university." *Evaluation Review* 25(6):619-654.

Stern, D., Dayton, C., & Raby, M. (2010). *Career Academies: A Proven Strategy to Prepare High School Students for College and Careers*. Berkeley, CA: Career Academy Support Network (Graduate School of Education, University of California). http://casn.berkeley.edu/resource_files/Proven_Strategy_2-25-1010-03-12-04-27-01.pdf

SUMMARY TABLES

Table A-1: Comparing student characteristics in grade 10, all academies combined —

Each cell shows percent of academy or non-academy students in each category

Student characteristic	Academy students (n=19,051)	Non-academy students	
		In all high schools (n=480,708)	In high schools with academies (n=119,774)
Female	51.3	48.5	48.4
Parent education			
Not a high school graduate	23.2	17.4	21.5
High school graduate only	22.7	19.8	22.1
Some college or AA degree	17.0	19.2	17.0
Bachelor's degree only	11.6	16.0	12.4
Post-graduate	4.8	9.5	6.4
Decline to state	20.8	18.1	20.6
Subsidized lunch eligible	62.9	48.5	58.4
Ever classified ELL	57.4	42.8	53.5
Initially FEP	8.4	8.0	8.2
Reclassified FEP	32.9	19.2	24.9
English learner now	16.2	15.7	20.5
Special education	6.0	9.6	10.1
Race or ethnicity			
American Indian	0.5	0.7	0.5
Asian	8.9	8.6	9.2
Pacific Islander	0.8	0.6	0.7
Filipino	3.6	2.7	3.1
Latino	58.9	48.7	57.4
African American	8.6	7.1	7.9
White	16.2	28.7	18.7
Two or more	2.4	2.9	2.5
Grade 9 ELA test scores			
Bottom quartile	24.6	25.6	29.7
Without special ed.	22.0	21.4	25.0
Second quartile	34.6	26.0	27.8
Without special ed.	35.3	26.6	28.9
Third quartile	25.3	24.1	23.0
Without special ed.	26.4	25.7	24.8
Top quartile	15.5	24.4	19.5
Without special ed.	16.3	26.3	21.3

Table A-2: Comparing characteristics of academy and non-academy students in grade 10, one academy at a time ––

Each cell shows number of academies with or without significant differences (total n=400)

Student characteristic	Academy had more or higher	No difference or mixed	Academy had less or lower	Too few students or no variance
Female	106	220	71	3
Parent education	20	339	24	17
Subsidized lunch eligible	43	311	35	11
Ever classified ELL	55	302	37	6
Special education	10	258	70	62
Race or ethnicity				
American Indian	0	1	0	399
Asian	13	110	25	252
Pacific Islander	0	3	0	397
Filipino	10	42	3	345
Latino	53	301	41	5
African American	8	159	18	215
White	37	171	31	161
Two or more	1	42	0	357
Grade 9 test scores				
ELA performance level	114	258	28	0
Without special ed.	97	261	36	6
ELA scale score	126	218	56	0
Without special ed.	108	218	68	6
Math performance level	74	287	39	0
Without special ed.	60	291	43	6
Math scale score	98	236	66	0
Without special ed.	78	246	70	6

Table A-3: Comparing student characteristics in grade 11, all academies combined —

Each cell shows percent of academy or non-academy students in each category

Student characteristic	Academy students (n=14,292)	Non-academy students	
		In all high schools (n=463,768)	In high schools with academies (n=111,648)
Female	53.2	48.8	48.9
Parent education			
Not a high school graduate	23.0	17.2	20.8
High school graduate only	22.6	19.3	21.4
Some college or AA degree	17.1	19.5	17.1
Bachelor's degree only	12.4	16.5	13.7
Post-graduate	4.8	9.9	6.9
Decline to state	20.1	17.7	20.1
Subsidized lunch eligible	62.0	46.4	55.7
Ever classified ELL	57.6	42.4	52.7
Initially FEP	8.4	8.4	8.4
Reclassified FEP	35.8	19.7	26.2
English learner now	13.4	14.3	18.1
Special education	6.0	9.6	9.5
Race or ethnicity			
American Indian	0.5	0.7	0.5
Asian	9.6	9.0	10.2
Pacific Islander	0.8	0.6	0.8
Filipino	4.0	2.8	3.4
Latino	58.0	46.7	54.0
African American	8.0	7.0	8.0
White	16.7	29.7	20.0
Two or more	2.5	3.5	3.2
Grade 9 ELA test scores			
Bottom quartile	21.4	24.0	26.1
Without special ed.	18.7	20.0	21.5
Second quartile	32.8	25.5	26.9
Without special ed.	33.4	26.0	27.8
Third quartile	28.4	25.1	24.8
Without special ed.	29.8	26.7	26.7
Top quartile	17.3	25.4	22.2
Without special ed.	18.2	27.3	24.0

Table A-4: Comparing characteristics of academy and non-academy students in grade 11, one academy at a time —

Each cell shows number of academies with or without significant differences (total n=331)

Student characteristic	Academy had more or higher	No difference or mixed	Academy had less or lower	Too few students or no variance
Female	91	189	48	3
Parent education	18	268	24	21
Subsidized lunch eligible	39	265	20	7
Ever classified ELL	47	254	23	7
Special education	8	198	47	78
Race or ethnicity				
American Indian	0	1	0	330
Asian	18	84	15	214
Pacific Islander	0	8	0	323
Filipino	14	36	2	279
Latino	46	262	18	5
African American	5	107	21	198
White	16	161	25	129
Two or more	0	35	2	294
Grade 9 test scores				
ELA performance level	86	202	29	14
Without special ed.	58	231	27	15
ELA scale score	97	173	47	14
Without special ed.	78	175	63	15
Math performance level	46	239	32	14
Without special ed.	36	244	36	15
Math scale score	62	200	55	14
Without special ed.	51	197	68	15