What are the Chances of Getting into a UC School? A Look at the Course-taking Patterns of High School Students For UC Admissions Eligibility

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Project 3.1: Methodologies for Assessing Student Progress, Strand 2
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WHAT ARE THE CHANCES OF GETTING INTO A UC SCHOOL? A LOOK AT THE COURSE-TAKING PATTERNS OF HIGH SCHOOL STUDENTS FOR UC ADMISSIONS ELIGIBILITY

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Abstract

The University of California Office of the President (UCOP) has been concerned about the disproportionately low rate of some racial/ethnic groups on campuses of the University of California and is committed to increasing the enrollment of traditionally underrepresented racial and ethnic groups on UC campuses. To this end, course-taking patterns of high school cohorts are examined to shed light on the disproportionate number of traditionally underrepresented minority students in their UC admissions eligibility. Variables of student characteristics and course grades are analyzed to show a significant difference between the partnership and non-partnership schools, as well as different sub-groups of students. The results show that higher proportions of students from the partnership schools remain eligible for UC admission across all variables, and that high course grades from UC required courses (e.g. Algebra 1) increase the probability of being eligible for UC admission. Further, the ethnicity and attendance rates of students are also highly associated with UC eligibility. These factors, as well as some insights into the possible intervention of at-risk students with low rates of UC admission eligibility, are suggested and discussed in this report.

Introduction

The University of California Office of the President (UCOP) has been concerned about the disproportionately low rate of some racial/ethnic groups on campuses of the University of California and is committed to increasing the enrollment of traditionally underrepresented racial and ethnic groups on UC campuses. The district data analyzed for this study, for instance, shows that only 3.7% of African American and 4.4% of Hispanic students become eligible for UC admission at the end of high school. One of the programs implemented to address the underrepresentation is the School/University Partnership (S/U P) Program, commissioned by the University of California Office of the President to

increase the enrollment of racially and ethnically underrepresented students on UC campuses. The strategy employed by the S/U P Program is to increase these students' UC eligibility by increasing their ability to complete UC preparatory courses.

UC preparatory courses, referred to as the A-G requirements (Appendix A), are a set of 15 classes required by the UC schools if a student is to be considered eligible for admission to a UC school. These classes are academically rigorous courses consisting of English, math, science, history, performing arts, and foreign language. For UC-bound high school students, these courses are the first hurdle to overcome to achieve UC admissions eligibility.

This study examines various factors (e.g., gender, English proficiency, attendance rate, etc.) associated with a high completion rate of the A-G requirements by designating 6 out of the 15 required classes as "benchmark courses" to be completed at an assigned time period. Moreover, by using the completion rate of the benchmark courses as the primary indicator, comparisons are made between the schools participating in the S/U P Program (partnership schools) and those that do not (non-partnership schools) throughout this report. The purpose of this report is to provide policy makers and school administrators with research-based information to assist in making decisions to address the aforementioned issues.

To that end, the focus of this study is an in-depth look at the course-taking patterns of students who complete the benchmark courses in each semester of Grades 9, 10, and 11. More specifically, questions that this report will attempt to answer include the following:

- What proportion of students is completing the benchmark courses at the end of each semester?
- Who are those students by demographics and other student characteristics? Is there a pattern consistent across selected variables?
- How likely is it for a certain type of student (e.g., African American male student with high attendance rate) to finish all six benchmark courses? What are other key student profiles, and what are the probabilities of each student profile completing all six benchmarks?

- What is the risk involved in each semester of not completing or not taking a benchmark course by various student characteristics?

The research methods employed to answer the above questions include finding a pattern in frequency counts and proportion in percents, plotting the frequencies and proportions in a meaningful way, using logistic regression to calculate the probabilities of completing all the benchmark courses, and calculating the expected probabilities of remaining UC-eligible by various key student profiles. The above methods, as well as other methods, will be described in more detail and explained in the methodology section of this report.

The preliminary results show that only a small proportion of students in the district complete all six benchmark courses over the three-year period covering Grades 9, 10, and 11. This is manifest across all student characteristics and levels of academic achievement. Furthermore, the pattern with which the numbers decrease seems to be similar in many variables of student characteristics. The probabilities of completing all benchmark courses by student profiles, however, differ widely depending upon the specific combinations. For example, the probability of an African American male attending fewer than 75 days of school in a semester (or being absent one day per week on average) is much lower than that of white female attending more than 75 days of school. The probabilities of becoming ineligible by discontinuing with the sequence of the benchmark courses are also described and presented in a graphical way. The aforementioned results in their entirety, as well as other results, will be described in the results section of this report.

The results and conclusions of this report may be very effectively utilized in implementing an intervention program for high-risk groups, be they just an ethnic group or a combination of several student characteristics, which can easily be identified from the results section. Schools can immediately focus in on the group of students who need the most help and start planning for an intervention. Moreover, because the analysis performed in this study is longitudinal in nature, the school administrator can focus on a specific time period for which an intervention is necessary. For example, we found that a large proportion of students become ineligible for UC admission between the end of the 10^{th} grade and the middle of the 11^{th} grade. Hence, an intervention program can be implemented to prevent students from falling off-track during this period.

Review of Previous Reports

Center for the Study of Evaluation (CSE) Technical Report 584 by Quigley and Leon (2003), "How are High School Students Faring in the College Prep Curriculum? A Look at Benchmark Data for UC Partnership High Schools in the University of California's School/University Partnership Program," asks the following questions:

- How does A-G completion for students in the University Partnership schools compare to A-G completion for those in their encompassing district?

- What proportion of students in the UC Partnership schools is on-track (completing the benchmark courses) and off-track (failing or not taking the benchmarks) in completing six key A-G requirements by particular grade levels, referred to as benchmark courses?

- What are the primary reasons for students being off-track in completing the six key A-G course requirements?

- Do on-track and off-track patterns differ by ethnicity or by other background characteristics?

Quigley and Leon (2002) in their report found that only 5.0% of the project students remain on-track at the end of the 12th grade. This is in contrast to 7.2% for the entire district. However, their study revealed that all ethnic groups in this project except African Americans have a higher eligibility rate than the district as a whole. Moreover, the study revealed that about half of the project students left the UC Partnership schools. Of the remaining students about a third did not take the UC-approved English 9 and more than half did not take Algebra I by the end of ninth grade. Therefore, the two primary reasons for the 95% attrition rate given for the partnership schools in the report are: leaving the partnership schools and not taking the courses required by UC. Finally, the study found that staying on-track was harder for males and Limited English Proficient (LEP) students. The latter, in particular, tended not to take the English benchmark courses and had a more difficult time completing them. In addition, African American students exhibited the same pattern with Algebra I. They either did not take the class or had a more difficult time completing them when compared with Hispanic students. In conclusion, the report recommends a

strong middle school preparation, more effective guidance for those students falling off-track to catch up, and additional collaborative research with institutes such as CSE. (For information on Algebra I as a gatekeeper for college, see Paul, 2000.)

We believe that this report will make a significant contribution in developing and implementing some of the recommendations of the previous report by pinpointing the *characteristics* of the students who are falling off-track and *when* they become ineligible for UC admission. Further, identifying students at risk by key profiles (combinations of their characteristics), can make the intervention efforts much more efficient and effective. As mentioned before, an intervention program tailored to specific groups of students can make the program more effective than a one-size fits-all type of program across the district.

Importance of Examining Course-taking Patterns

Examining patterns of students taking courses over a period of time can reveal important insights into their academic progress. Such patterns show which courses a student has taken during which semester of their high school endeavor. They also reveal background characteristics of a particular group of students who have taken certain courses (Finn, 1999; Lee, Croninger, and Smith, 1997; Oakes, 1990). Moreover, Bryk, Lee, and Smith (1990), from their analysis of the High School & Beyond Study, contend that student course-taking and tracking, different courses of study for different groups of students, are the "most powerful predictors of academic achievement," significantly above any background characteristics when held constant. Most importantly, Quigley and Leon (2002) have found that course-taking patterns of benchmark classes (A-G requirements) are one of the best indicators of the UC eligibility for admission.

This report delves further into the course-taking patterns of high school students in a large school district in California by first identifying key patterns and the background characteristics associated with such patterns. Based on the information above, a probability of success will be computed for several important student profiles. The school administrators can then plan and implement an intervention focused on a specific group (e.g., African American, male, free/reduced lunch, passed English with a C).

In discussing UC eligibility, we will use the terms on-track and off-track. On-track is the status of a student who has passed both benchmark courses designated for a particular semester. Off-track is the status of a student who did not take the required courses or did not pass with a "C" or better. Therefore, to be on-track for the first semester of the ninth grade, a student would need to pass Algebra 1A and English 9A. The following chart shows the benchmark courses and the time frame within which to complete them for the purposes of this study:

Table 1.1

Benchmark Courses By Semester from Grade 9 to 11

Grade notation	Grade by semester	Benchmark classes
9A	Grade 9, first semester	Algebra 1 AB English 9 AB
9B	Grade 9, second semester	
10A	Grade 10, first semester	Geometry AB English 10 AB
10B	Grade 10, second semester	
11A	Grade 11, first semester	Algebra 2 AB Chemistry AB
11B	Grade 11, second semester	

Research Questions

Key questions this study seeks to answer are as follows:

1. Overall patterns

- What proportion of students is on-track at the end of each semester by various student characteristics (e.g., gender, ethnicity, and course grades)?

- Does each student characteristic exhibit a distinct pattern? Is the pattern similar to any other patterns for a different characteristic?

2. Partnership schools vs. non-partnership schools

- Does the proportion of students being on-track at the end of each semester differ by partnership school status?

- How do the three groups compare?

3. Expected probabilities of being on-track by key student profiles

- How likely is it for a certain type of student (e.g., an African American male student attending more than 75 days in a semester) to finish all six benchmark courses?

- What are some of the other key student profiles?

- How does a student attending a partnership school (with a certain key profile such as above) compare with a student at a non-partnership school who has the same key profile?

4. Predicted risk patterns by student characteristics and course grades

- What is the risk involved at each semester of not completing or not taking a benchmark course by various student characteristics and by partnership school status? How do the corresponding groups compare?

These questions will be addressed in different sections using the methods mentioned below.

Research Methods

Since there are two groups, partnership schools (project schools in which the program is implemented) and non-partnership schools (non-project schools), both will be addressed in answering each question. In addition, a group of students who dropped out of the program is also considered. We differentiate these students into two groups: a group that transferred to a non-partnership school in the same district, and a group that either dropped out of school or moved to another district. We cannot make a distinction between the latter two since our data do not provide any information on inter-district transfers. However, we assume that such transfers are very small in number in high school, and that the dropout group is practically the students who stopped attending any school. Additionally, it is critical to take these students into account from the intervention perspective. Since about half of the project students drop out of partnership schools at various times during the three years (Grades 9 – 11), an immediate implementation of an intervention program may be in order.

Matching

To make the comparisons between the partnership and non-partnership schools as closely as possible, we use propensity score matching (Becker and Ichino, 2002; Dehejia and Wahba, 2002; Rosenbaum and Ruben, 1983) of the two groups to control for the ratio of ethnicity and SES, the two variables crucial to the discussion of the efficacy of the S/U P Program. For ethnicity, we used the proportion of the traditionally underrepresented minorities in the UC campuses, namely, African Americans, Hispanics, American Indians, and Pacific Islanders. For SES, we used the proportion of free/reduced lunch at each school. Then we selected 36 non-partnership schools that closely matched the partnership schools in these two variables, matching the number of students for both groups of schools as well. Then comparisons were made between the partnership schools and the total non-partnership schools sample, and also the partnership schools and the matched non-partnership school sample.

Graphical Representation of Descriptive Statistics and Survival Analysis Results

This study makes an extensive use of frequency counts and proportion in percents in looking at the changes in the number of students on-track from the beginning of the 9th grade to the end of the 11th grade. Different patterns are revealed from these frequencies by the selected variables, as well as the general pattern, which are noted and discussed in detail. In addition, descriptive statistics also allow us to find out when most students seem to drop out of the path to UC eligibility, and when they appear to stay on with the program. Obviously, school administrators would want to know these results to plan and implement a program or to improve an existing program. For instance, a principal at a partnership school would need to know what period (semester or year) most students drop out of the program.

We also utilize line graphs to show both the change from semester to semester and its magnitude. In the descriptive section, two plots, the total sample, and the matched sample, of each selected variable are shown in terms of the time period of one semester. In each graph, moreover, four trajectories are shown: two trajectories for the partnership schools and two for the non-partnership schools. Plotting is useful for comparing the patterns of different groups within the same variable such as male and female, partnership school students and non-partnership school students, and underrepresented ethnic

groups and well-represented groups. All graphs exhibit a downward trend throughout the three years, from the start of the 9th grade to the end of the 11th grade, meaning students keep falling off-track until the end.

Plotting is also used in showing the survival and hazard functions for each selected variable. One can easily see that the survival functions resemble the frequency plots in that both exhibit a downward trend. The hazard functions starkly show the risk of falling off-track and its magnitude. Hence, one can easily see from these graphs which semester presents a higher risk than others. Additionally, we use graphs to show interactions with time. That is, they reveal whether the risk at each semester varies with time. Since an interaction is sometimes hard to visualize without a plot depicting it, we provide a graph showing an interaction whenever it is relevant to our discussion.

Logistic Regression

Since our dependent variable is either on-track or off-track at each point in time (represented 1 or 0, respectively) logistic regression is used for the analysis. This method prevents one from getting meaningless results such as negative values of off-track or values greater than 1 for on-track coding. We use this method for two reasons. First, we find expected probabilities of staying on-track at each point in time until the end of 11th grade for students having various key profiles. For example, a student of an underrepresented ethnic group (e.g., Hispanic) with a high grade in Algebra 1 who has attended school more than 75 days would yield a certain expected probability of remaining on-track at each point in time until the end of 11th grade.

Discrete-time Survival Analysis

The on-track/off-track data used for this study are no longer available after the end of Grade 11. We do not know whether a student was on-track after this time point. That is, the on-track/off-track data during Grade 12 is either not available for analysis or censored. One way to incorporate the 12th grade year is to employ discrete-time survival analysis (Singer and Willett, 1993) to correctly model this type of data. If we treated the students who remained on-track until the end of 11th grade as becoming off-track, or excluded these students from the data, we would get inaccurate results because the data were not used appropriately.

To conduct the analysis, the hazard and survival probabilities are obtained using logistic regression. Since the outcome is a probability, the logistic transformation will yield values between 0 and 1. If p is a hazard probability, for example, logit (p) is the log-odds of falling off-track, conditional upon the on-track status of the previous semester. A survival probability is just one minus the corresponding hazard probability, multiplied by the survival probability of the previous semester. Various logistic regression models then can be developed and be interpreted in the same way one does linear regression models. Therefore, using the logistic regression method, we can estimate the expected probabilities for various key student profiles as well as obtaining the hazard probabilities. Therefore, we solve the problem of censored data by using the survival analysis to predict the probabilities of remaining on-track for different groups and variables.

Results

Description of Sample

The data for this study come from a large urban school district in California. It consists of a ninth-grade cohort of 1996 with 48,589 students. The data include their background characteristics such as gender, ethnicity, attendance, magnet school participation, free meal status, and English proficiency as well as information about academic courses such as the completion status of the benchmark classes, course grades, and GPA. Since the data also have detailed information regarding the A-G courses including the final grades, a set of variables indicating whether a student is on-track has been created based on the benchmark courses criteria, illustrated in the introduction. Being on-track indicates that a student has taken and passed with a "C" or better in both of the benchmark courses designated for the particular year, while being off-track indicates that a student did not pass or had not taken both benchmark courses.

In addition to the aforementioned variables, the variable depicting the status of partnership school status is also utilized. For example, there is a variable categorized for students attending a partnership school or non-partnership school. Another variable distinguishes between the students who attended a partnership school until the end of the 11th grade, and those who started at a partnership school but moved away or dropped out of the program for some reason.

The variables have been selected for their significance in the purpose of this study. The variables selected for the background characteristics are gender, ethnicity, English proficiency, participation in the magnet program (integration program), participation in the free meal program, and the number of days attended in the fall semester of their ninth grade. The other variables, selected for a high proportion of on-track students at the end of the 11th grade, are the final course grade in Algebra 1, whether a student took Algebra 1 in the 8th grade (one year prior to the benchmark year), and the final course grade in the 9th grade English, as well as their status of completion in Algebra 1 and English 9.

All the variables selected for students' background characteristics carry much significance for the partnership schools, which are usually located in neighborhoods economically depressed and populated by historically underrepresented minority groups – African Americans, Hispanics, American Indians, and Pacific Islanders.

The results are illustrated and explained starting with the descriptive statistics of the selected variables. Then we examine the survival and risk factors for each variable, noting the recurring patterns of being on-track through all six semesters. Next, we present the probabilities of being on-track by key profiles of different characteristics that may shed light on improving the chances for historically underrepresented students to be admitted to a UC school.

Overall Frequency of Students Who Are On-track

Based on the benchmark courses mentioned earlier, each student is recoded at each semester as either being on-track or off-track. Then the frequency and its corresponding proportion (in percent) are taken for each variable. Table 2.2 below displays the overall on-track status for all students in the cohort at the end of each semester from Grade 9 through 11.

Table 2.1
Number and Proportion of Students On-Track By Semester.

Time period (semester)	Number of students on-track	Percent (%) of students on-track (% change)
Grade 9, fall (9A)	23,833	49.05
Grade 9, spring (9B)	18,084	(11.83) 37.22
Grade 10, fall (10A)	12,944	(10.58) 26.64
Grade 10, spring (10B)	11,099	(3.80) 22.84
Grade 11, fall (11A)	6,457	(9.55) 13.29
Grade 11, spring (11B)	5,407	(2.16) 11.13

Table 2.1 above shows several important patterns. First, more than half of the cohort falls off-track at the end of the first semester. That is, about 51% of the students did not either take or pass the required courses or left the cohort altogether. Second, only 11% of the students remained on-track after 6 semesters. Thus, approximately 90% of the cohort drops out of the on-track status, becoming ineligible for applying to a UC campus. Furthermore, it is significant to note that more students fall off-track in between grades (e.g., 9th to 10th, 10th to 11th) than between fall and spring semesters of the same year, except for the first semester. For example, during the spring semester of 10th and 11th grade, about 4% and 2% fall off-track, respectively, while at the beginning of Grade 10 and 11, about 11% and 10% fall off-track, respectively. Thus, the summer between Grade 10 and 11 seems to be a critical period during which a large number of students fall off-track.

Table 2.2

Comparison Between Partnership and Non-partnership Schools

	Partnership schools	Non-partnership schools	Matched Non-partnership schools
Number of schools	26	83	36
Number of students	14,390	34,199	17,010
% Female	*48.38*	*48.40%*	*48.10%*
% Underrepresented minorities	*97.64%*	*74.97%*	*89.89%*
% LEP	*30.54%*	*23.92%*	*30.26%*
% Free/reduced lunch	*83.97%*	*63.87%*	*78.30%*
Number of students on-track	1,380	4,027	1,302
% on-track within group	*9.59%*	*11.78%*	*7.67%*
Number excluding dropouts	1,328	4,004	1,297
% on-track excluding dropouts	*17.46%*	*17.67%*	*12.38%*

Note. Matched non-partnership schools are a sub-sample of the total non-partnership schools and will be discussed later.

We look next at the above proportions by the partnership school status. A partnership school is one participating in the S/U P Program, and a non-partnership school is not taking part in the program. Table 2.2 compares the two groups of schools in some student characteristics and the frequencies of students

being on-track. We see from the table that the partnership schools have more underrepresented minorities, more students receiving free/reduced lunch, and more English learners (LEP students). The gap exceeds 20% in underrepresented minorities and free/reduced lunch. But the disparities are less pronounced in the percentage of the English learners, and there is no difference in the proportion of gender.

The percent on-track for all students in the partnership schools is 9.59% while the percent for the non-partnership schools is 11.78%. We can be more precise in comparing the two groups if we exclude the dropouts and just consider those who finished at one school without transferring. The percentage of students on-track then comes out about the same for both groups of schools, 17.46% for the partnership schools and 17.67% for the non-partnership schools.

Next, we examine more closely the students who finished all six semesters and remained on-track. In Table 2.3, we distinguish among three groups of students: those who remained at a partnership school until the end of their 11th grade, those who started at a partnership school but either moved to a non-partnership school or dropped out of school altogether at any time during the six semesters, and those who started and finished at a non-partnership school.

Table 2.3 shows that about 30% (15.65% + 2.35% + 11.62%) of all students in the district started the S/U P Program. However, only a little more than a half (15.65%) of the students who started the program stayed in the program until the end of Grade 11. As the table reveals, these students who stayed with the partnership program have the higher proportion (17.46%) of on-track students at the end of their 11th grade year than those who moved to a non-partnership school or who dropped out of school altogether. Therefore, the fact that less than 4% of the students who transferred to a non-partnership school remained on-track seems to indicate that the students in the S/UP Program need to stay in the program to get its benefits.

Table 2.3

Number and Proportion of On-Track Students Per Semester By Partnership School Status

	Partnership school (*remained* until end of 11th grade)		**Partnership school (*moved / dropped out* after starting 9th grade)**		**Non-partnership school (did *not* attend a partnership school, *excluding* dropouts)**	
Time period (semester)	Number of students on-track	Percent (%) of students on-track (% change)	Number of students on-track (Moved / *dropped*)	Percent (%) of students on-track (Moved / *dropped*)	Number of students on-track	Percent (%) of students on-track (% change)
Grade 9, fall (9A)	4,527	59.52	530 / 1,984	46.49 / 35.15	13,221	58.33
Grade 9, spring (9B)	3,826	(9.22) 50.30	392 / 1,111	34.39 / 19.68	10,796	(10.69) 47.64
Grade 10, fall (10A)	2,901	(12.16) 38.14	199 / 421	17.46 / 7.46	8,064	(9.68) 37.96
Grade 10, spring (10B)	2,570	(4.35) 33.79	147 / 281	12.89 / 4.98	7,562	(4.59) 33.37
Grade 11, fall (11A)	1,559	(13.29) 20.50	54 / 64	4.74 / 1.13	4,605	(13.05) 20.32
Grade 11, spring (11B)	1,328	(3.16) 17.46	41 / 11	3.60 / 0.19	4,004	(2.65) 17.67
Number of students within group (% of Total students)	7,606 (15.65)		1,140 / 5,644 (2.35 / 11.62)		22,664 (46.64)	

Table 2.3 also shows three distinct patterns of students remaining on-track, although all three groups lose the most students during the first three semesters, after the initial loss at the end of the fall semester of Grade 9. Partnership school students start out and end with the highest proportion of on-track students. Moreover, the students from this group fall off-track between grades (from Grade 9 to 10, and Grade 10 to 11) at a much higher rate than they do between semesters (from fall to spring). Their pattern can be compared to the non-partnership schools, which display a similar pattern (higher percentage of falling off-track between grades) except during the spring semester of Grade 9. The highest

proportion (13.05%) of the non-partnership school students falls off-track during this fifth semester of the program more than any other semester.

The students who transferred out of the program show a much more drastic decrease of being on-track. For instance, by the end of the fall semester in Grade 10, more than 80% falls off-track. At the end of the 11th grade, less than 4% is eligible to apply to a UC school. That is, only 41 out of 1,140 students who started but dropped out of the program remained on-track. Hence, the disparity between this group and the students who stayed with the program is huge (41 and 1,328). This "transfer group" also displays the typical pattern of a significant decrease between grades although the change from the end of Grade 10 and the beginning of Grade 11 is not as pronounced as the change in the group which stayed and finished at a partnership school.

All groups, however, exhibit a common pattern. First, the fall semester of the ninth grade shows the most drastic decline of all semesters. 3,079 (41%) of the partnership school students, 9,443 (42%) of the non-partnership students, and 610 (54%) of the students who transferred fell off-track during the first semester. Also as mentioned, the proportion of drops from one grade to the next is bigger than the decline within the same grade. For instance, of the partnership school students, 925 students, or more than 12%, drop out of the program between the 9th and 10th grade. Another 1,011 (13%) students again become ineligible for UC admission between 10th and 11th grade. However, only 231 (4%) and 331 (3%) students fall off-track within the 10th and the 11th grades. Similarly for non-partnership schools, 1,332 (12%) and 2,957 (10%) students fall off-track between the 9th and 10th grade, and 10th and 11th grade, respectively. But only 502 (4.6%) and 601 (2.6%) students fall off-track within the same grade. Lastly, more students fall off-track during the first three semesters than the second three. For example, 62% of the partnership students, 63% of the non-partnership, and 83% of the partnership school dropouts fall off-track during the first three semesters.

The following plot of the overall frequency graphically illustrates the pattern of each group of students remaining on-track. Each point represents the percentage of on-track students at the end of the corresponding period. For example, the points along the period 9A represent the proportion of students remaining on-track at the end of the fall semester in the ninth grade. Similarly, the points along 11B represent the proportion of on-track students at the end of the spring semester in the 11th grade.

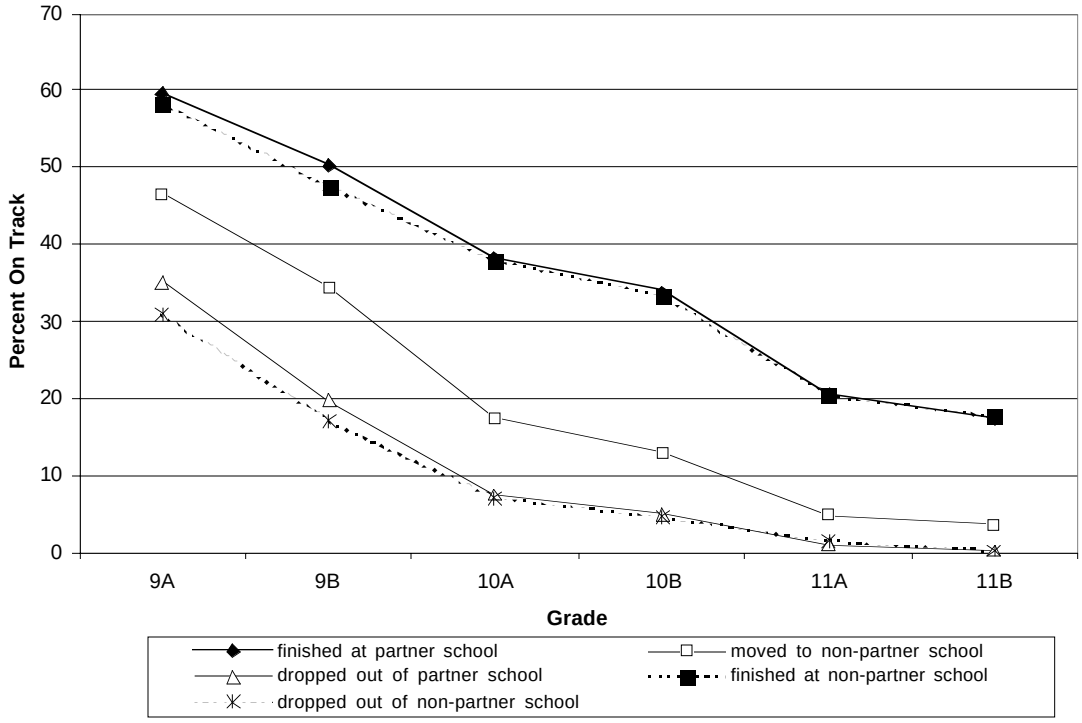

Figure 2-1. Percent on-track by semester and by partnership school (total sample).

Figure 2-1 above shows the percent of students being on-track by five different categories of partnership school status. It reveals that students attending a partnership school and those attending a non-partnership school have the same rate of staying on-track, except for the first two semesters, during which the partnership school students show a little higher on-track rate. The students who transferred to a non-partnership school show a lower proportion of remaining on-track than those who stayed in the S/U P Program throughout the three-year period. The transfer group also displays more students who fall off-track during the second semester than any other semester, with its rate leveling off in the next four semesters. The graph also shows the dropout groups for the partnership and non-partnership schools. As in the groups that finished in the same school, these groups show virtually the same proportion of being on-track going down to 0%, except for the first two semesters, during which the non-partnership dropouts show a little lower proportion of being on-track.

Matched Non-partnership Schools

In comparing the non-partnership schools with the partnership schools, we have found a gross mismatch between the two groups (See Table 2.2.). The former include a lower proportion of underrepresented ethnic groups and more students with higher socioeconomic status, while the latter comprise 26 schools in economically depressed areas where a large proportion of historically underrepresented minorities such as African Americans and Hispanics live. To better match the ethnic makeup and the free/reduced lunch rate (a proxy for the SES level) we selected 36 non-partnership schools that closely matched on these aspects. For instance, Table 2.2 shows that the underrepresented ethnic groups for the matched non-partnership schools comprise on average about 90% (vs. 75% in the total sample), which best matches the 97.64% for the partnership schools without compromising the number students and the free/reduced lunch ratio. The SES, measured by the ratio of receiving free/reduced lunch, for the matched non-partnership schools is 78.3%, which closely matches 83.97% for the partnership schools (vs. 64% in the total sample). Thus, the comparison between the partnership schools and the non-partnership schools will be more meaningful when they are matched as closely as possible.

Table 2.4 and 2.5 delve further into separating the students who dropped out of school from both the partnership and non-partnership schools, and show the frequencies of each group in more detail.

Table 2.4 shows that when the total students are separated by the partnership school status, 11.78% of the non-partnership and only 9.59% of the partnership school students remain on-track (comparison A). If we compare those who finish all six semesters in their respective high schools, the rate of being on-track seems more comparable. The partnership schools show 17.46%, and the non-partnership schools, 17.67% (comparison B).

Table 2.4

Number of On-Track Students at the End of Grade 11 (Total Non-Partnership Schools, N=34,199 in 83 Schools)

Comparisons	Partnership school status	On-track status by Finish, Transfer, or Dropout	Number of students on-track	Total number of students within group	Percent Within group	Grand total
Total sample	All schools		5407	48589	11.13	48589
Comparison A						
*By **partnership schools***	*Partnership*		**1380**	14390	**9.59**	
	Non-partnership		4027	34199	11.78	
Total			5407	48589		48589
Comparison B						
*By **partnership schools***	*Partnership*	Finish at partnership school	**1328**	7606	**17.46**	
*and **finish/drop status***		Transfer to non-partnership school	**41**	1140	**3.60**	
		Drop out of school	**11**	5644	**0.19**	
		Total	1380	14390		
	Non-partnership	Finish at non-partnership school	4004	22664	17.67	
		Drop out of school	23	11535	0.20	
Total			5407	34199		48589
Grand total				48589		

Table 2.5 reveals that when the partnership schools are compared to the matched non-partnership schools that have similar ethnic makeup and SES levels, the former have more students staying on-track than the latter. With the dropouts included, the partnership schools show a 2% higher on-track rate than the matched non-partnership schools. The former exhibits a 9.63% on-track rate, and the latter, 7.67% (comparison C). However, if we consider only those who

finished all six semesters, the difference between the two school groups becomes more conspicuous. At the end of 11th grade, 17.46% of partnership school students remained on-track, while 12.38% remained on-track for the matched non-partnership schools, excluding dropouts and transfers (comparison D).

Table 2.5

Number of On-Track Students at the End of Grade 11 (Matched Non-Partnership Schools, N=16,974 in 36 Schools)

Comparisons	Partnership school status	On-track status by Finish, Transfer, or Dropout	Number of students on-track	Total number of students within group	Percent within group	Grand total
"matched" sample	All schools		2,682	31,298	8.57	31,298
Comparison C *By **partnership schools***	*Partnership*		**1,380**	14,324	**9.63**	
	Non-partnership		1,302	16,974	7.67	
Total			5,407	31,298		31,298
Comparison D *By **partnership schools***	*Partnership*	Finish at partnership school	**1,328**	7,606	**17.46**	
*and **finish/drop status***		Transfer to non-partnership school	**41**	1,130	**3.63**	
		Drop out of school	**11**	5,588	**0.20**	
		Total	1,380	14,324		
	Non-partnership	Finish at non-partnership school	1,297	10,480	12.38	
		Drop out of school	5	6,494	0.08	
Total			1,302	16,974		31,298
Grand total				31,298		

Therefore, we start to see a program effect when we match the partnership and non-partnership schools in their ethnic makeup and the ratio of free/reduced lunch. The effect seems most pronounced when we look at only those who finished all six semesters. Compared to 17.46% of the partnership students who remained on-track at the end of the six semesters, only 12.38% of the non-partnership students stayed on-track in the matched sample. This is a

difference of 5% in favor of the partnership program compared to 0.2%, in favor of the non-partnership schools in the total sample. Even if we include the dropouts and transfers in the matched sample, we see the partnership students being on-track 2% higher than their non-partnership counterpart.

Another group in Tables 2.4 and 2.5 is the students who either changed schools or dropped out of school. Of the 14,324 students attending the partnership schools, approximately 8% of them (1,130 students) transferred to a non-partnership school in the district. Moreover, 39% (5,588 students) of the partnership school students dropped out of school altogether. These two groups of students comprise about 47% of all the students in the S/U P Program. Additionally, Figure 2-2 shows that these students have a much lower rate of remaining on-track compared to those who stayed with the program. Only about 3.6% of those who moved to a non-partnership school and 0.02% of those who dropped out of school remained eligible for UC admission at the end of the 11th grade. Hence, it seems that students need to stay in the partnership school to reap the benefits offered by the S/U P Program, as mentioned earlier.

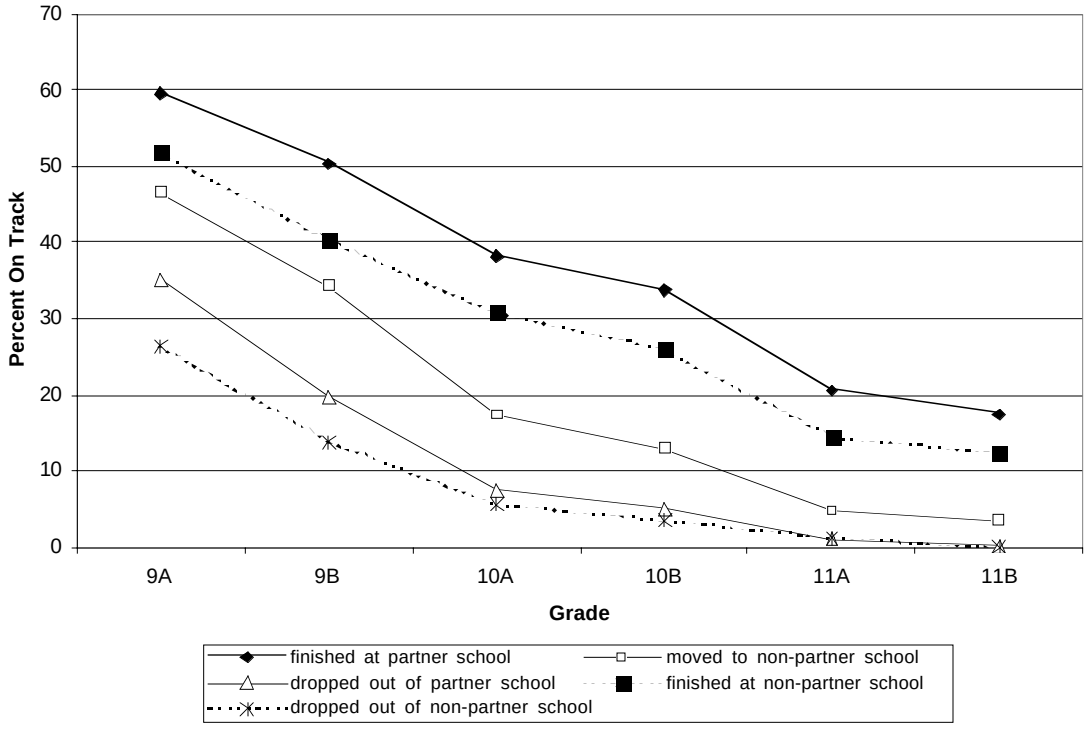

Figure 2-2. Percent on-track by semester and by partnership school (matched sample).

From Figure 2-2, we confirm that the students who remained until the end of the program display the highest proportion of being on-track throughout the three years. It is also clear that those who dropped out of the program show the lowest proportions of being on-track. The group displaying the lowest proportion is the dropouts attending a non-partnership school. Partnership school students who moved to a non-partnership school within the same district show a much lower proportion than those who finished 11th grade at a partnership school. Further, this "transfer" group shows a different pattern from the groups that stayed on for all three years. The partnership school students who moved to a non-partnership school seem to fall off-track most rapidly in the second semester (i.e. between 9B and 10A), while the students who stayed in their respective schools seem to fall off-track in the largest numbers between the end of 10th and the middle of 11th grade. Finally, almost all students who dropped out of school fall off-track during their 11th grade year.

The patterns described here are very similar to the ones described earlier for the total sample. The time points at which the most students fall off-track are the same for both samples. The shape of the different trajectories is very similar as well. The only difference, as pointed out previously, is that the matched non-partnership schools now display a 5% lower proportion of students being on-track. However, the difference between the dropout groups is negligible because their on-track rate is both close to zero.

Despite these differences, a pattern emerges in both samples and both the partnership and non-partnership schools. That is, there is a sharp decline in the first two semesters (9th grade), a slower decrease from the fall to the spring semester of 10th and 11th grades, and the sharpest drop between 10th and 11th grade. We will refer to this pattern as "typical" or "general" since most of the frequency plots presented in this paper look similar to this pattern.

In examining the following student characteristics and their course taking patterns, only the students who completed all six semesters from the fall of the 9th and spring of the 11th grade were considered since we wanted to evaluate any possible effect of participating in the School/University Partnership Program. Thus, the students who dropped out of school or transferred to another school are excluded since those students are included in the general discussions in the beginning of this section. Each variable (student characteristics and academic performance) will be presented with two graphs. The first one is based on the

total number of non-partnership schools (See Table 3). The second graph is based on the matched sample of the non-partnership schools. Instead of 83 non-partnership schools, a sample of 36 such schools matched in SES and ethnicity is used. It also shows 4 trajectories, as in the first graph. Two of the four describe the partnership school students and the other two the non-partnership school students such as, for instance, male and female students at the partnership schools, and males and females at the non-partnership schools.

Gender

Males and females in both the total and the matched sample discussed above are evenly distributed, although there is a slightly higher number of boys in both samples. Figure 2-3 below shows four groups: males and females who started high school and finished 11th grade at the partnership schools, and male and female students who finished 11th grade at the non-partnership schools.

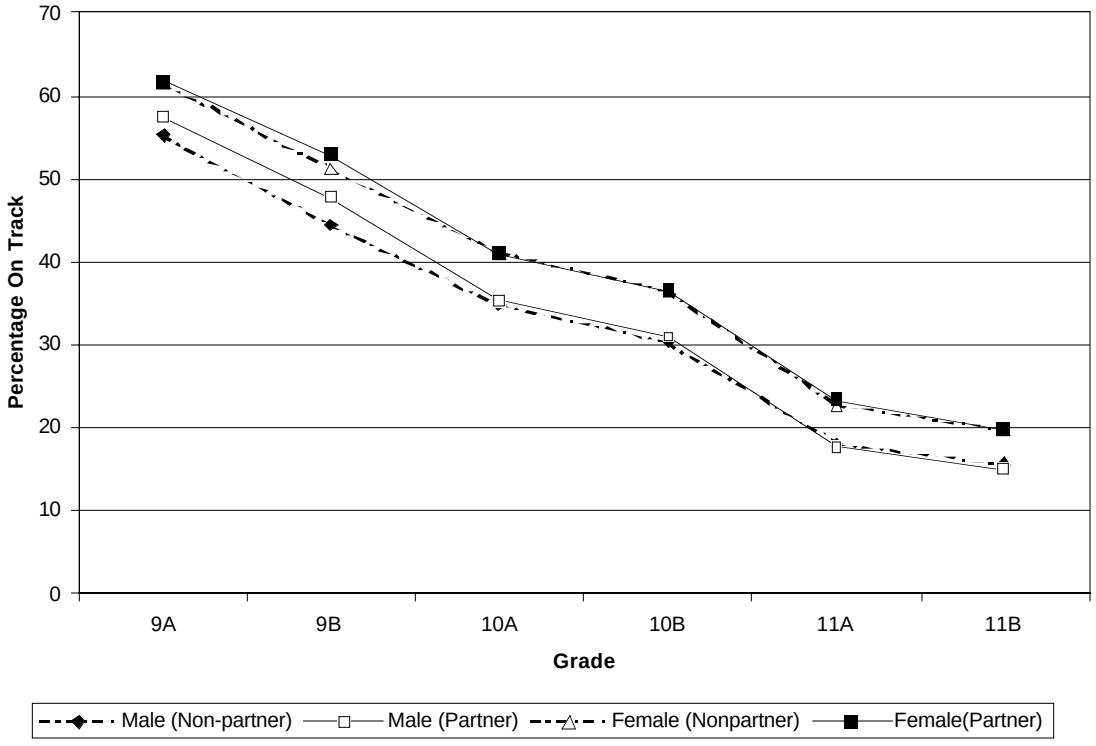

Figure 2-3. Proportion of on-track students by gender and partnership schools (total sample).

From Figure 2-3 of the total sample, we can see that more girls stay on-track for all three years. Moreover, the gap between the partnership and non-

partnership schools is minimal during the first two semesters, and the difference between the two groups disappears after ninth grade. That is, practically the same proportion of partnership school students is on-track as the non-partnership school students throughout the period. All groups display the general pattern of a rather fast decline during the first two semesters, leveling off in 10th grade, a sharp drop from 10th to 11th grade, and a plateau in 11th grade.

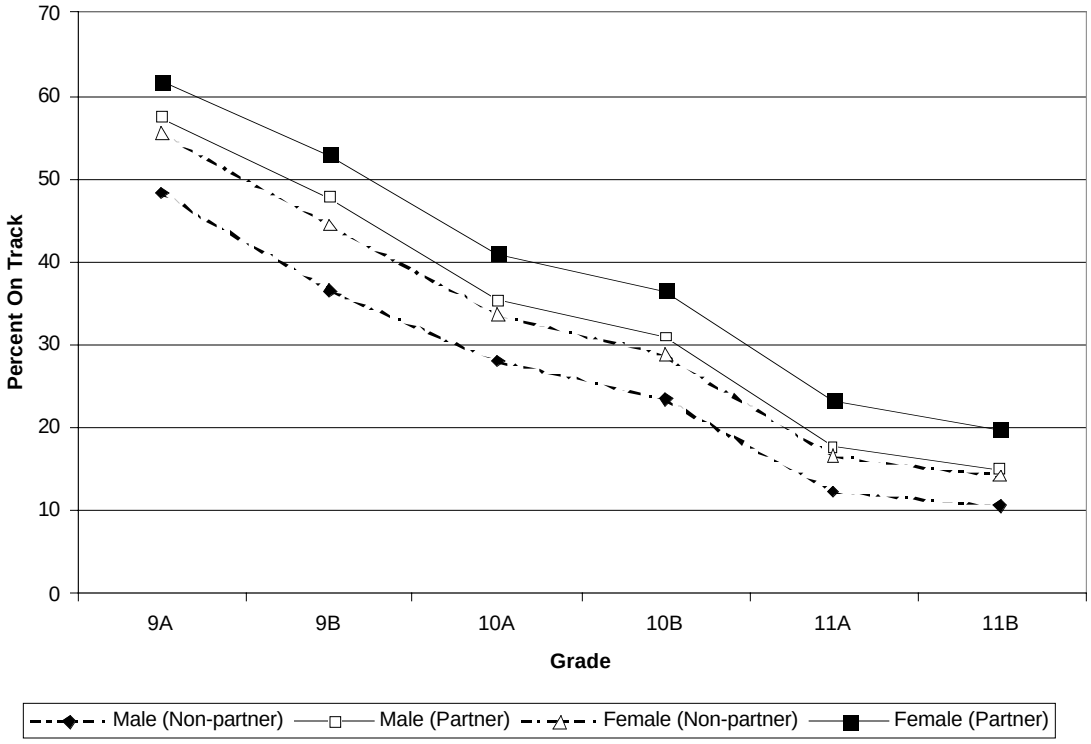

Figure 2-4. Proportion of on-track students by gender and partnership school (matched sample).

Figure 2-4 shows the gender difference in the matched sample. It is significant to note here that the female students fall off-track at a lower rate than their male counterparts in each group. Further, more males and females of the partnership school students remain on-track than both sexes of the non-partnership group. For example, a higher proportion of male partnership students remain on-track than female students at non-partnership schools. As in the total sample, the shapes of the trajectories are similar to the general pattern and are virtually parallel, with gaps between the groups narrowing a little at the end of 11th grade.

Ethnic Groups

Seven ethnic groups are represented in the district, and the proportion of on-track students for each group is displayed in Table 2.6. They are American Indian, Asian, African American, Hispanic, White, Filipino, and Pacific Islanders. The historically underrepresented groups at the UC campuses are American Indian, African American, Hispanic, and Pacific Islanders. The rest, Asian, White, and Filipino, will then comprise the other group.

Table 2.6

Number and Proportion of Students by Ethnic Groups

Ethnic group	Number of students	*% Total*	Partnership students	*% Partnership school students*	Non-partnership students	*% Non-partnership students*
African American	7,023	*14.5*	3,283	*22.83*	3,733	*10.93*
American Indian	165	*0.3*	32	*0.23*	133	*0.39*
Asian	2,468	*5.1*	101	*0.70*	2,367	*6.93*
Filipino	965	*2.0*	19	*0.13*	946	*2.77*
Hispanic	32,322	*66.5*	10,719	*74.54*	21,544	*63.10*
Pacific Islander	188	*0.4*	8	*0.06*	180	*0.53*
White	5,458	*11.2*	219	*1.52*	5,239	*15.34*
Total	48,589	*100.00*	14,162	*100.00*	28,903	*100.00*

It is significant to note that African American and Hispanic students constitute approximately 81% of all students, about 97% of the partnership students, and about 74% of the non-partnership students in the data. This means that the majority of discussions regarding the historically underrepresented ethnic groups will involve the African American and Hispanic students in the sample. The well-represented group consisting of whites, Asians, and Filipinos makes up about 18% of the entire population of students in the sample.

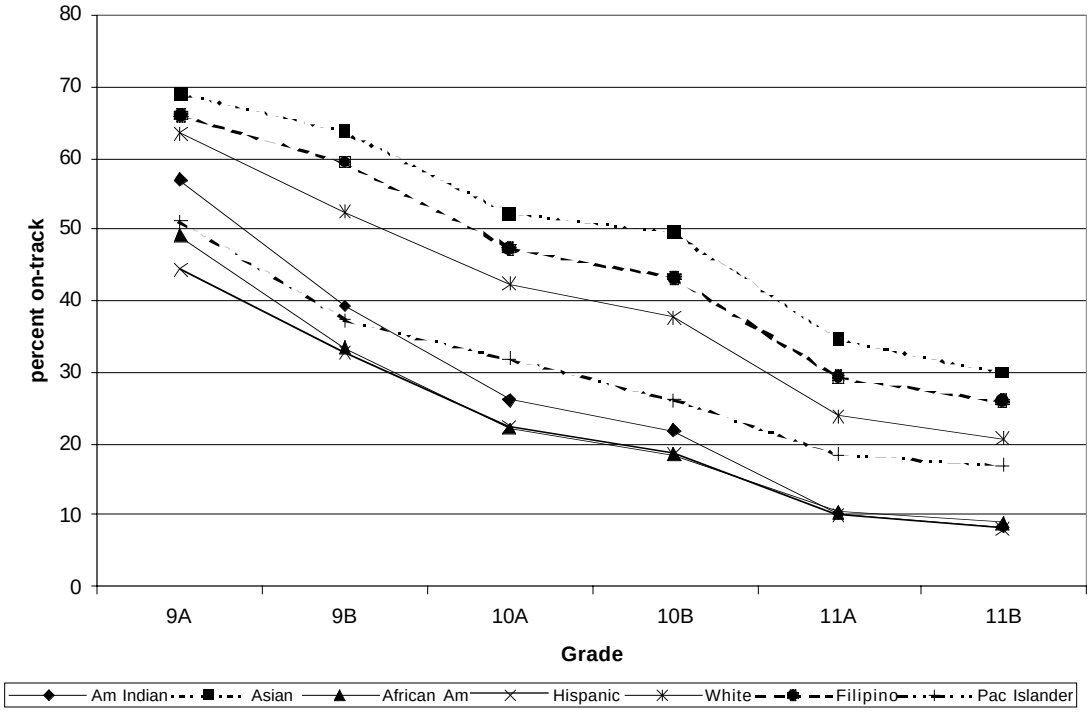

Figure 2-5. Proportion of on-track students by ethnic groups and by partnership schools (total sample)

From Figure 2-5 we can see two distinct trajectories: one representing Asian, White, and Filipino groups and the other representing African American, Hispanic, and American Indian/Pacific Islander groups. Higher proportions of Asian, Filipino, and white students are shown to be on-track than are Pacific Islander, American Indian, African American, and Hispanic students. Of the first three groups, Asian students exhibit the highest proportion of on-track students. Sixty-nine percent of Asian students were on track at the end of the first semester, and 30% of them remained on-track at the end of the 11th grade. Filipino and white students show a somewhat lower proportion, but all three ethnic groups display the same pattern. There are sharper declines between 9th and 10th grades, and 10th and 11th grades, and smaller declines from the fall to spring semesters of the same grade. One difference, however, is that a higher proportion of the white students fall off-track during the first semester than do Asian and Filipino students.

The other four ethnic groups, on the other hand, show different patterns of decline. American Indian students show a sharp decline in the proportion of on-

track students during the first two semesters, a leveling off for the third semester, and the same sharp decrease for the fourth. Pacific Islanders show a steady, continuous decrease until the last semester, during which the proportion of on-track students plateau. African American and Hispanic students display a similar pattern of a continuous decline for the first two semesters, leveling off, and a decrease between the 10th and 11th grades. Although African American students start with a higher proportion of on-track students than Hispanic students, both groups end with about the same proportion of 9% and 8%, respectively. Table 2.6 shows the number of students for each group and the corresponding proportions.

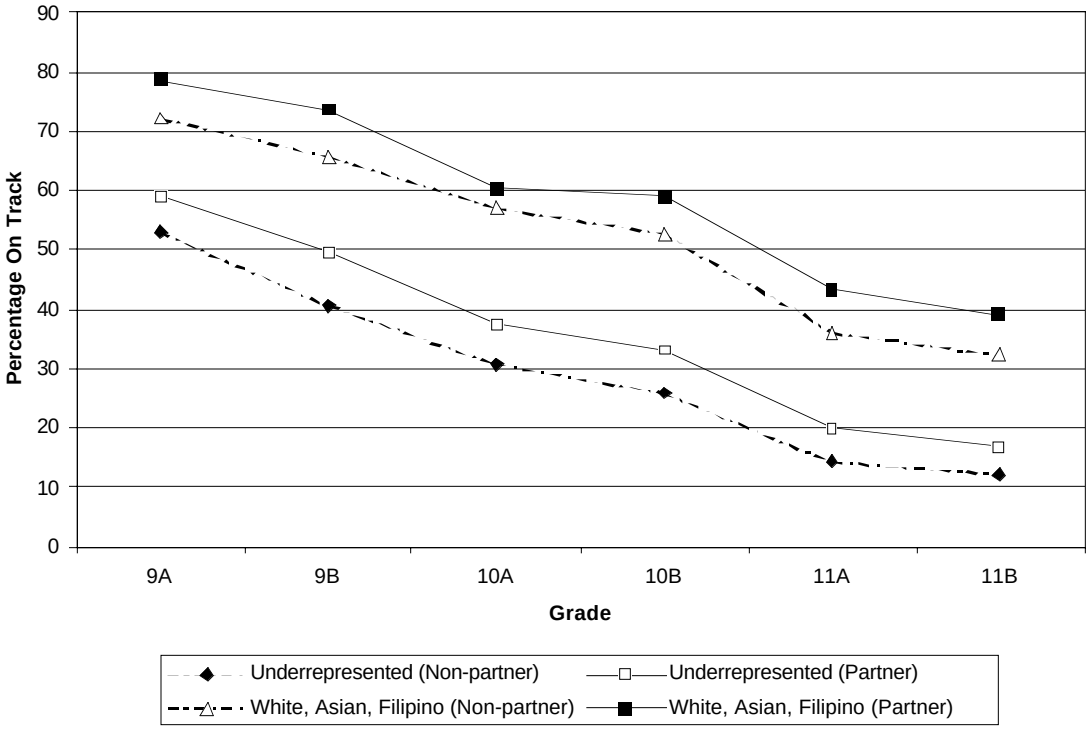

Figure 2-6. Proportion of on-track students by ethnic groups and by partnership school status (total sample)

As alluded to previously, the seven ethnic groups presented earlier are divided into two groups: the underrepresented group consisting of Hispanics, African Americans, American Indians, and Pacific Islanders, and the "well-represented" group consisting of Whites, Asians, and Filipinos. Figure 2-6 displays the underrepresented and well-represented groups who stayed in school for all six semesters, at the partnership and non-partnership schools. The figure shows the proportion of students who are on-track by ethnic groups in the

partnership schools (solid lines) and the total sample of non-partnership schools (broken lines). We see that the White / Asian / Filipino groups display about a 20% higher on-track rate than the underrepresented group for both partnership and non-partnership schools. The White / Asian / Filipino groups show over 70% on-track in the first semester, and the on-track rate decreases to 30%. The underrepresented groups, however, show the on-track rate in the 50s, finishing off in the low and high teens. There are differences between the partnership and non-partnership schools as well. The former shows a 4 to 5% higher on-track rate than the latter across all semesters and for both ethnic groups. All four groups seem to display a pattern similar to the general pattern, although there are subtle differences. Between the two groups in the partnership schools, the underrepresented group declines a little faster than the White / Asian / Filipino group during the first and the third semester. Further, these patterns seem different from the general pattern in that there is a sharp drop between the end of 9th and 10th grades (in the second semester), in addition to the usual 10th to 11th grade drop. The non-partnership schools follow the general pattern more closely since the rate of decline is the sharpest from the spring semester of Grade 10 and the middle of Grade 11.

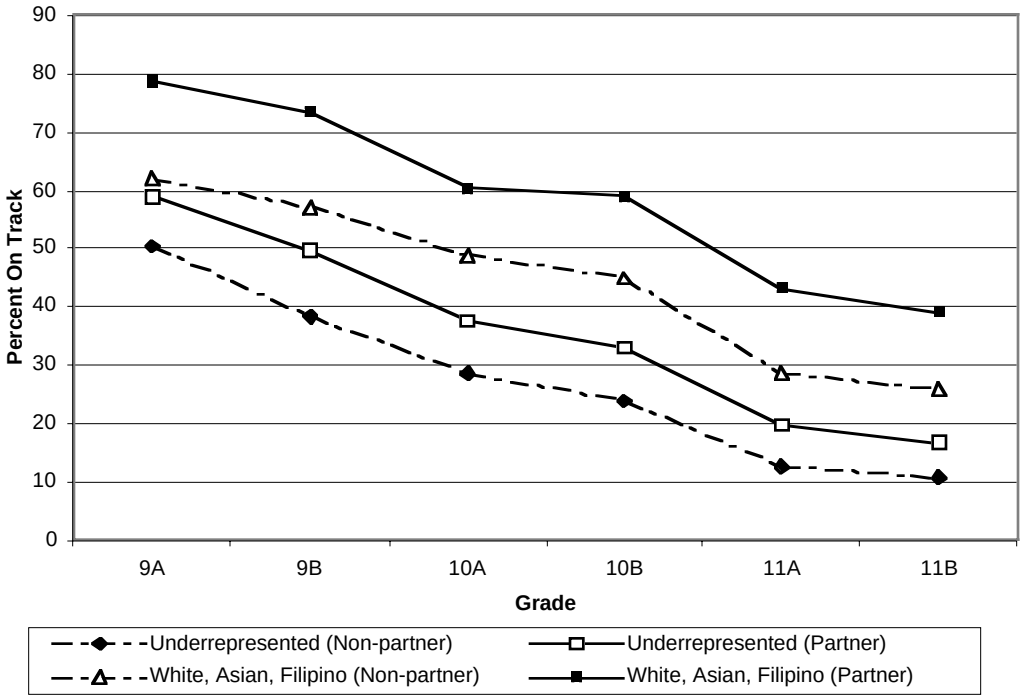

Figure 2-7. Proportion of on-track students by ethnic groups and partnership school status (matched sample)

Figure 2-7 shows students' partnership school status and historically underrepresented ethnic groups on UC campuses in the matched sample. The gap between the partnership schools and the corresponding non-partnership schools is wider in the matched sample, suggesting a possible program effect of the S/U P Program. Additionally, the disparity between the White/Asian/Filipino group and the underrepresented group in the non-partnership schools is smaller in the matched sample. In the first semester, the difference is about 8%, which increases to about 15% at the end of the 11th grade. We can see all trajectories resemble the general pattern except for the White/Asian/Filipino group at non-partnership schools, which is flatter for the first four semesters until a sharp decline occurs between 10th and 11th grades. Hence, although this group's on-track proportion is about the same as the underrepresented ethnic groups at the partnership schools, the flatter curve of this group causes a gap at the end of 11th grade.

Table 2.7

Number of On-Track Students Who Finished At, Transferred From, and Dropped Out of the Partnership Schools

	Underrep-transfer	**Underrep-dropout**	**Underrep-finished**	**White/Asian/Filipino-transfer**	**White/Asian/Filipino-dropout**	**White/Asian/Filipino-finished**
	N=1,115	N=5,542	N=7,394	N=25	N=102	N=212
On-track in 9A	515 (46.19%)	1,942 (35.04%)	4,360 (58.97%)	15 (60.00%)	42 (41.18%)	167 (78.77%)
On-track in 11B	37 (3.32%)	11 (0.20%)	1,245 (16.84%)	4 (16.00%)	0 (0.00%)	83 (39.15%)

Table 2.7 displays the number and ratio of the on-track students who finished, move from, and dropped out of the partnership schools that they started attending at the beginning of high school. We notice that those who transferred to a non-partnership school, as well as the dropouts, are also at a high risk of falling off-track. Only 3.32% of the underrepresented group and 16% of

the White / Asian / Filipino group who moved to a non-partnership school remain on-track.

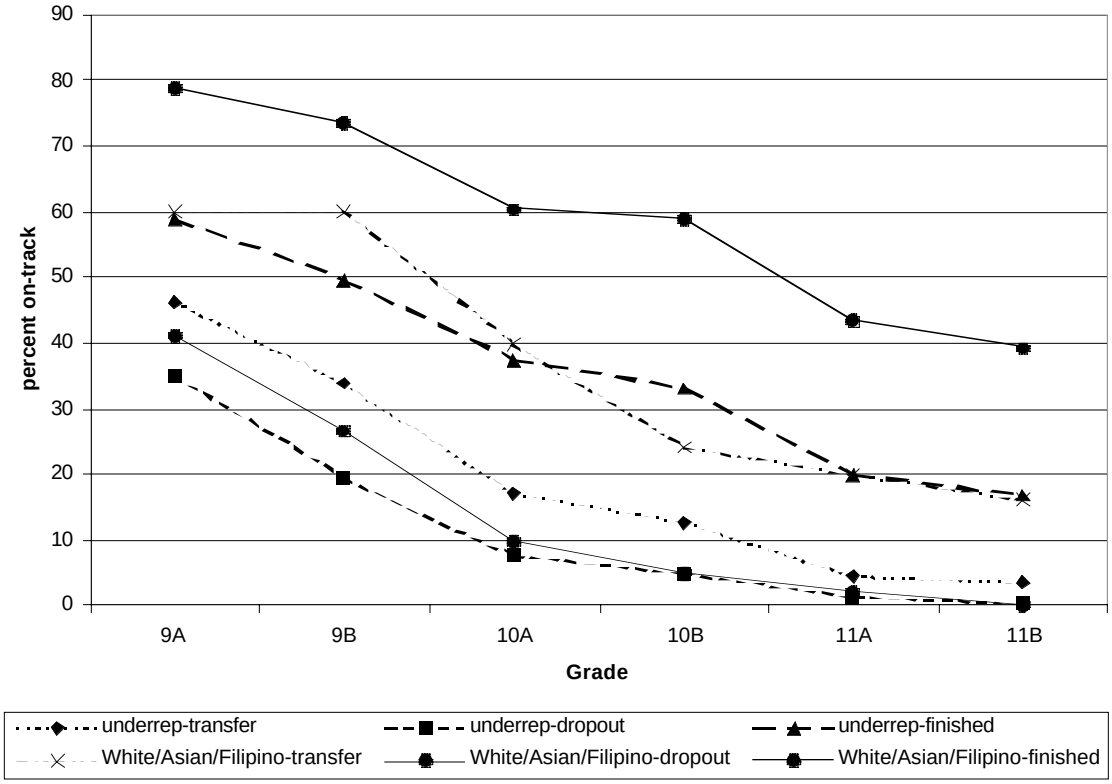

Figure 2-8. Percent on-track students by ethnicity at partnership schools who finished, transferred, and dropped out.

Of particular interest are the students who dropped out of the program (Figure 2-8). They started the program by attending a partnership school, but either moved away or dropped out of school. These students expectedly display the lowest proportion of being on-track at the start of the ninth grade and also finish the lowest. The White / Asian / Filipino group who dropped out shows a sharp decline of on-track proportions until the middle of the 10th grade before it stabilizes. From the beginning of the 9th grade to the middle of the 10th grade, for instance, more than 30% falls off-track from this group of White, Asian, and Filipino students. At the end of the 11th grade, no one from this group remains on-track. In addition, of the underrepresented students who dropped out of the partnership school program, less than 1% remained on-track. The dropouts are clearly the most at-risk and a target for an intervention.

English Proficiency

The ninth-grade cohort sampled for this study contains about a third of English learners (or LEP), who are not proficient in English. Four groups of students are compared for this variable: English learners and the proficient speakers who remained until the end of the 11th grade at both the partnership and non-partnership schools.

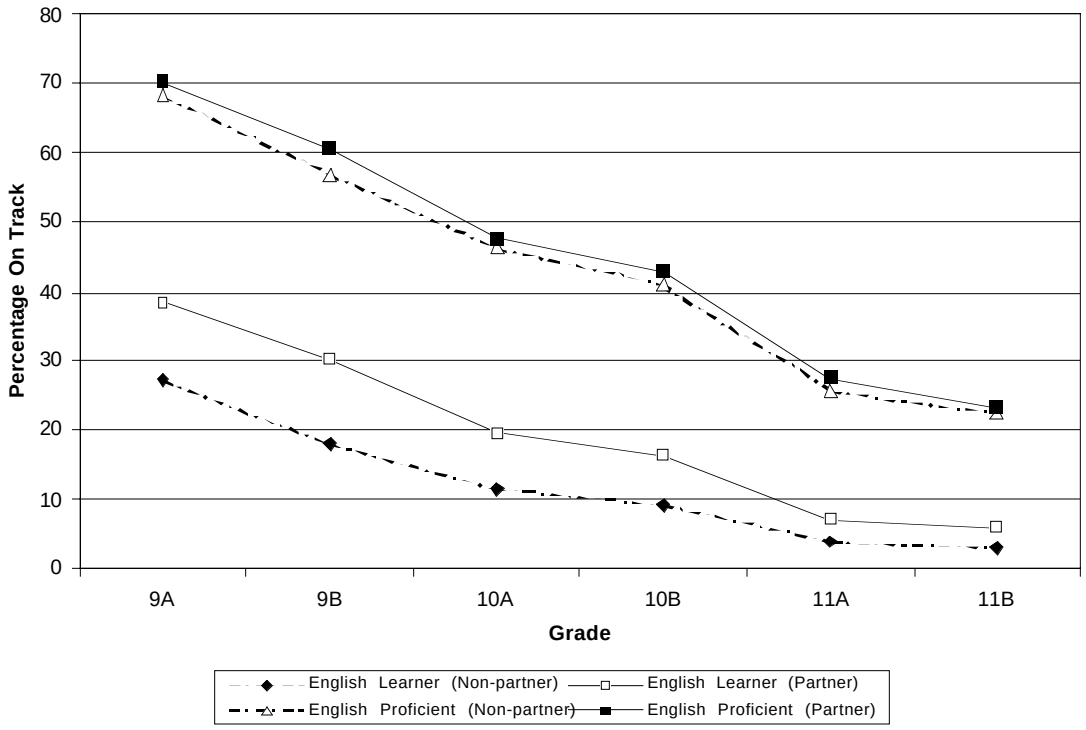

Figure 2-9. Proportion of students on-track by English proficiency and partnership school status (total sample).

Figure 2-9 shows the trajectory of being on-track by English proficiency. Approximately 27% of the English learners at non-partnership schools start out on-track, but only about 3% remain on-track at the end of 11th grade. The fluent English speakers at the non-partnership schools, on the other hand, show more than twice as much (68%) proportion of on-track students as the English learners at the start, and remain on-track approximately 7 times as much (22%) at the end of the 11th grade. Of the partnership school students, the proficient speakers remain on-track at the rate of 70% in the first semester and 23% at the end of the last. For English learners at the partnership schools, the rates are 39% and 6%,

respectively. Therefore, we see that the students at the partnership schools are doing a little better, although the English learners lag about 35% behind the fluent English speakers.

The proportion of fluent English speakers who are on-track, however, drops much faster than the English learners and resembles the general pattern. Although the English proficient students display about the same proportion of being on-track, regardless of their partnership school status, the English learners differ in their trajectories. The English learners at the partnership schools display about a 10% higher rate of being on-track than do their non-partnership school counterparts in the first semester. This gap narrows to about 3% at the end of 11th grade. Moreover, there is a gap between the fluent English speakers and the English learners of about 30% being on-track for the partnership schools, and about 40% of such a gap exists for the non-partnership schools. This huge gap indicates that the schools need to guide the English learner to be successful in the UC required courses so that more of these students could be on-track for UC admission.

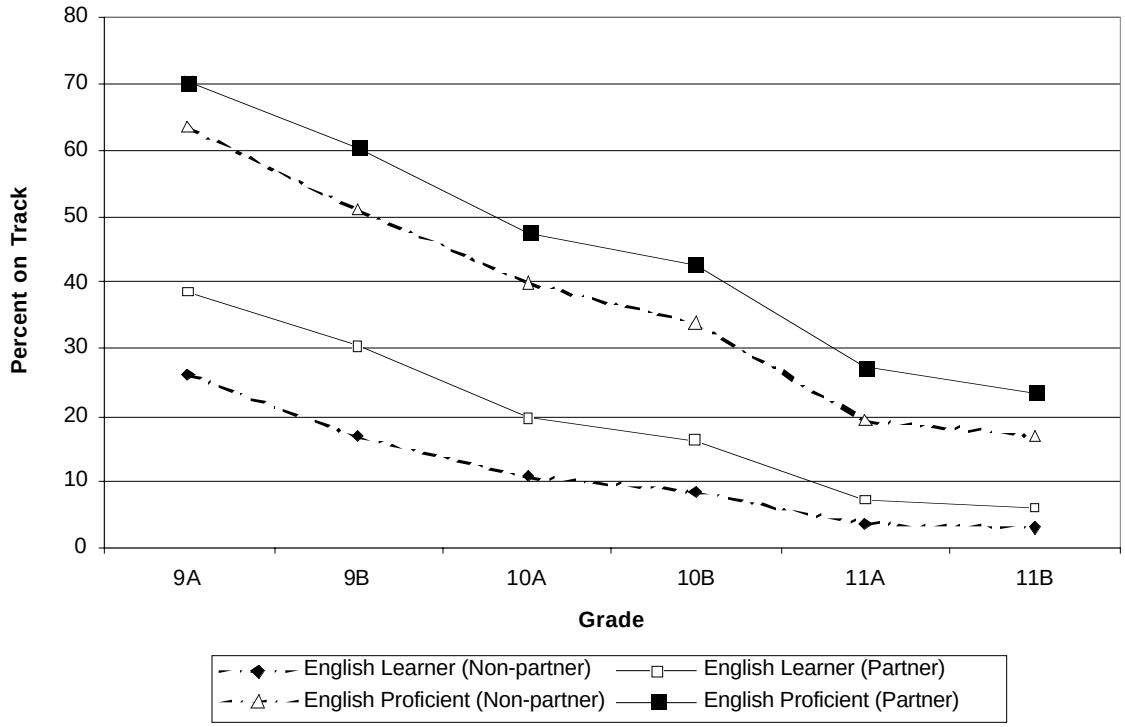

Figure 2-10. Proportion of on-track students by English proficiency and partnership school (matched sample).

Figure 2-10 shows the proportion of on-track students by English language proficiency and partnership school status in the matched sample. The trajectories for the English learners in this sample look very much the same as in the total sample, but the English proficient students in the non-partnership schools display a lower percentage of being on-track. This gap of about 7% seems constant over all three years, starting at 70% and ending at 23% for the partnership school students, and 63% at the first semester and 16% at the last for the non-partnership school students. Further, the trajectories of being on-track for English proficient students at both partnership and non-partnership schools follow the general pattern, while the trajectories of the English learners are flatter.

Attendance

Figure 2-11 shows the students who are on-track by the number of days attended in the fall semester of their ninth-grade year. The maximum number of days per semester is 90. The lowest number of days attended that still yielded at least some students being on-track seems to be mid- to high-40s. Forty eight days was determined to be the lowest number of days for analysis because hardly anyone who attended school fewer than 45 days was on-track after the first semester. Four other groups of students were determined with an increment of 10, reaching 87 days as the most number of days that students attended in that first semester.

Figure 2-11 also shows that about 78% of the students who attended school for 87 days during the semester stayed on-track in the first semester, and 32% of those students remained on-track at the end of 11th grade. By contrast, 32% of the students who attended school only half the time (48 days) were on-track at the end of the first semester, and none of the same students remained on-track by the beginning of the 11th grade. Moreover, the students who attended school almost everyday (87 days) seem to be set apart from the rest of the group. A much higher proportion of these students is on-track at the end of each semester, shown by a large gap between these students and the second group who attended school for 78 days.

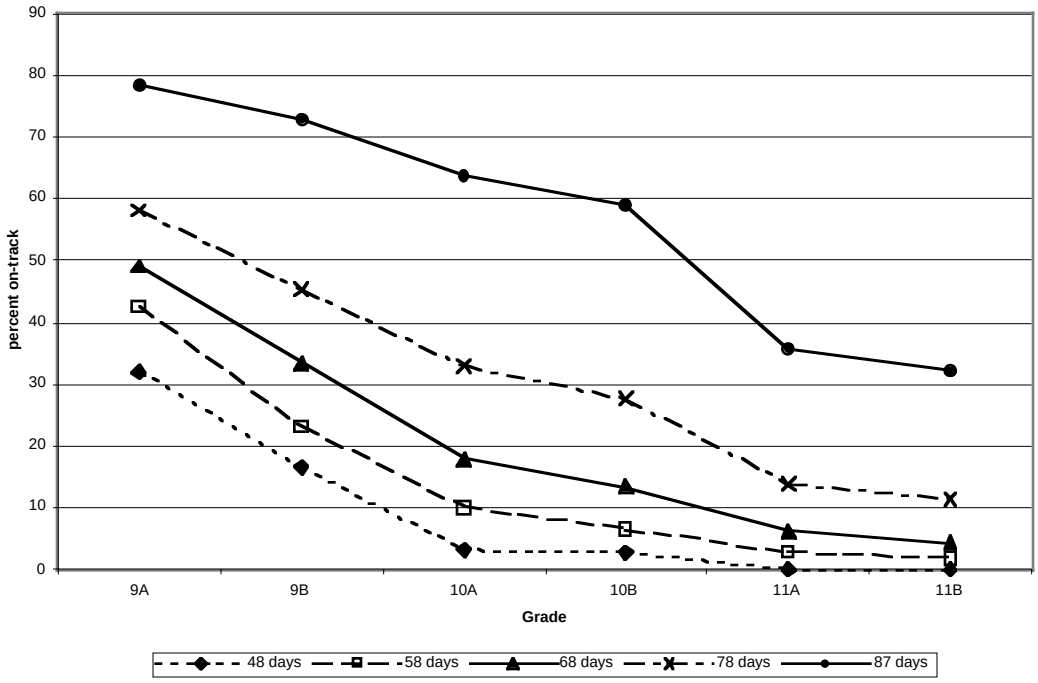

Figure 2-11. Proportion of on-track students by various attendance days (total sample).

The group with the highest number of days of attendance also exhibits a somewhat different pattern. For instance, there is a slow decrease for the first four semesters, until a sharp decrease in the first semester of the 11th grade, and a leveling off in the final semester. However, the pattern starts to change with the next group who attended school just 10 fewer days. This group shows a little sharper decline for the first two semesters than the first group, but a considerably slower decrease in the fifth semester, a rather typical pattern for most students in the district. The rest of the groups display yet another pattern. There is a sharp decrease in the first three semesters for all three groups, but the rate of decline is considerably lower after the first semester of the 10th grade. Further, less than 5% of these three groups, who attended school 68 days or fewer, will be on-track at the end of the 11th grade. These students were absent at least one and a half days per week. It is also significant to note that no one who attended fewer than 48 days was on-track after the six semesters.

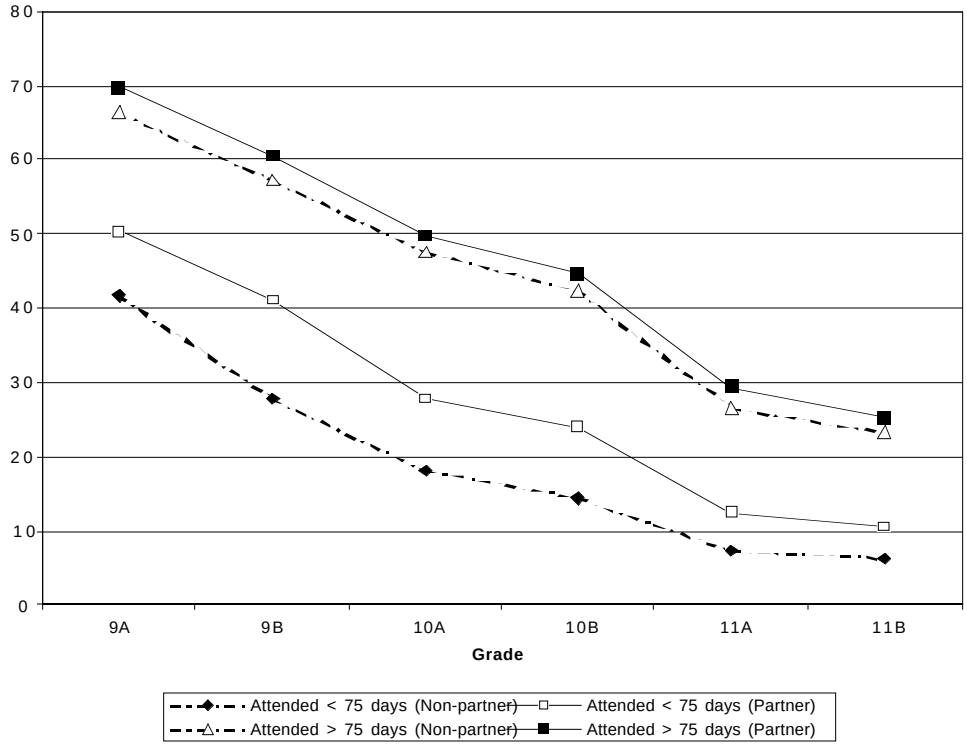

Figure 2-12. Proportion of on-track students by attendance and partnership school (total sample).

Figure 2-12 shows the proportion of being on-track by attendance days and partnership school status. We determined that 75 days as the critical number of days of attendance associated with being on-track or off-track. Hence, the graph shows the attendance rate and percent on-track based on the cut-off of 75 days that a student attended per semester, or missing school 1 day a week on average. So the four groups being compared are the high and low attendance groups who completed all 6 semesters at the partnership schools and the non-partnership schools. As with English proficiency, the proportion of being on-track for students in the total sample who attended school more than 75 days for both partnership and non-partnership schools are very close, and the gap between them is about 2.5%. However, for those who attended fewer than 75 days, the gap is wider—although these two groups start at 50% and 42%, respectively, with a gap of 8%, which narrows to about 3.5% at the end of 11th grade.

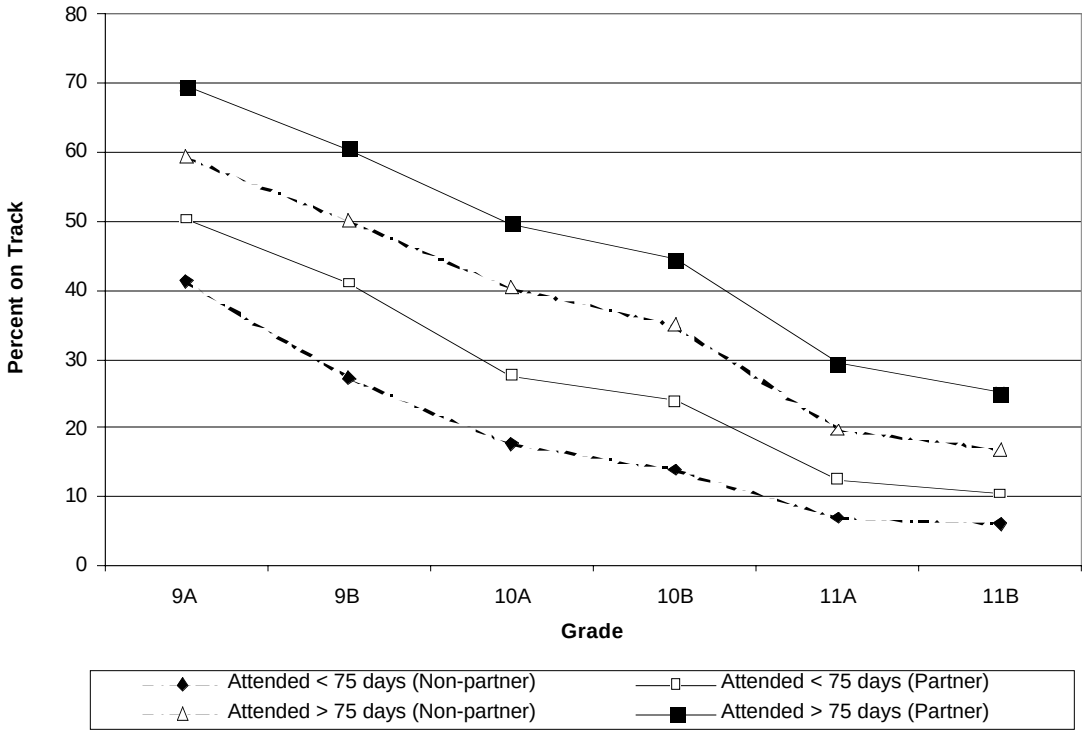

Figure 2-13. Proportion of on-track students by attendance and partnership school (matched sample).

Figure 2-13 shows attendance by the partnership school status in the matched sample. Again, 75 days out of 90 days per semester is used as a cutoff point. All four groups show the general pattern seen in the graphs of other student characteristics. The students who attended a partnership school for more than 75 days display the highest proportion of being on-track at the end of the 11th grade. However, students attending non-partnership schools for more than 75 days exhibit lower on-track proportions in this matched sample by about 10% throughout six semesters. This gap of 10% seems to be the main difference in the matched non-partnership schools sample in comparison to the 2.5% difference in the total sample. Further, the disparity between the students with high and low attendance at the partnership schools is about 20% in the first semester and decreases to approximately 15% at the end of the 11th grade. Students at the non-partnership schools show a similar trend, but their rate of remaining on-track is about 10% lower than the partnership school students. As with other student characteristics, the most dramatic decrease for attendance is between the end of 10th grade and the middle of 11th grade. Approximately 15% of students fall off-

track during this period for the high attendance group for both the partnership and non-partnership schools.

Magnet Program Participation

The magnet school program in this district was implemented for racial integration purposes, but it has become a set of schools perceived to have a superior academic program. Since there are more students applying to the magnet schools than there are spaces, students are selected through a lottery system.

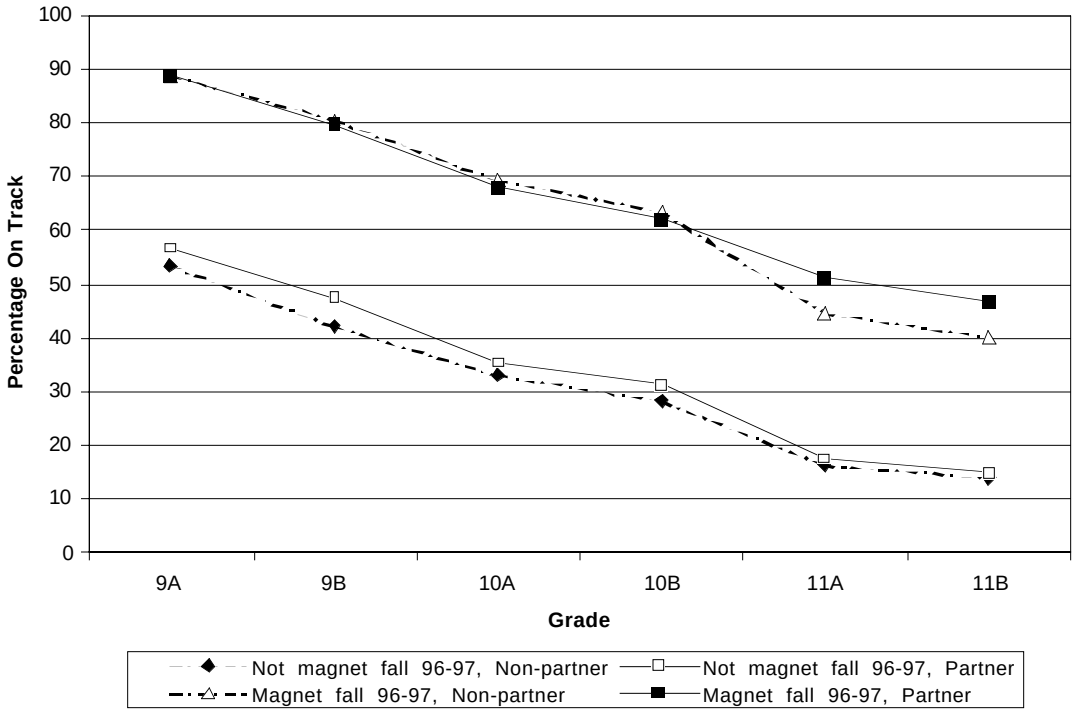

Figure 2-14. Proportion of on-track students by magnet program participation and partnership school (Total sample).

Figure 2-14 shows four groups of students: partnership and non-partnership schools students who are participating in a magnet school, and those are not. All students presented in the graphs completed all six semesters of high school until the spring of 11th grade. The figure exhibits the proportion of students on-track by magnet program participation in the total sample. It is clear that students attending a magnet school are on-track more than 30% higher than non-magnet students across all semesters. Approximately, 45% of magnet students remained

on-track at the end of 11th grade, while about 15% remained for non-magnet students. Among the magnet students, those who attended a partnership school fall off-track at the same rate until the end of 10th grade, but they remain on-track 6% higher than students attending a non-partnership school. The latter group displays a sharp drop during the first semester of 11th grade, a trajectory closer to the general pattern, while the magnet students attending the partnership schools fall off-track much more slowly during the corresponding semester.

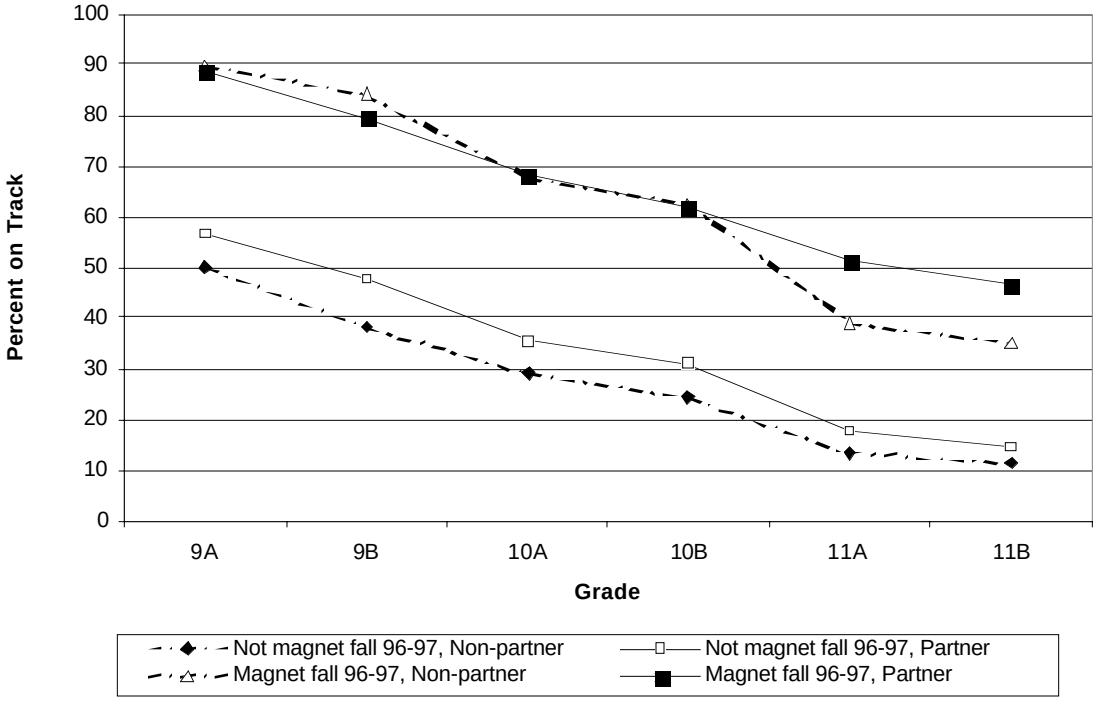

Figure 2-15. Proportion of on-track students by magnet participation and partnership school (matched sample).

Figure 2-15 shows magnet school participation and partnership school status in the matched sample. Again, the order in which the proportion of students on-track is the same in the total sample: magnet students at partnership schools at the highest proportion, then magnet students at non-partnership schools, non-magnet students at partnership schools, and non-magnet students at non-partnership schools. In this sample matched on the non-partnership schools, the students at the non-partnership schools display lower rates of being on-track, for both magnet and non-magnet groups. Compared to the 6% difference between the magnet groups in the total sample, we see an 11% gap for

the same groups in the matched sample. In addition, while the non-magnet groups in the total sample show less than 1% difference, the same groups in the matched sample exhibit more than a 3% gap. Thus in the matched sample, the partnership school effect seems more prominent in this student characteristic of magnet school attendance, as with others such as ethnicity, attendance rate, English proficiency, and gender.

Free/reduced Lunch Status

Free/reduced meal status is used as a proxy for students' socioeconomic status (SES) since free/reduced meals are given according to their family income. Hence, students whose family income is under a certain level are eligible to receive either free lunch or meals for a reduced amount. If their income is above the cutoff amount, they need to pay the full amount.

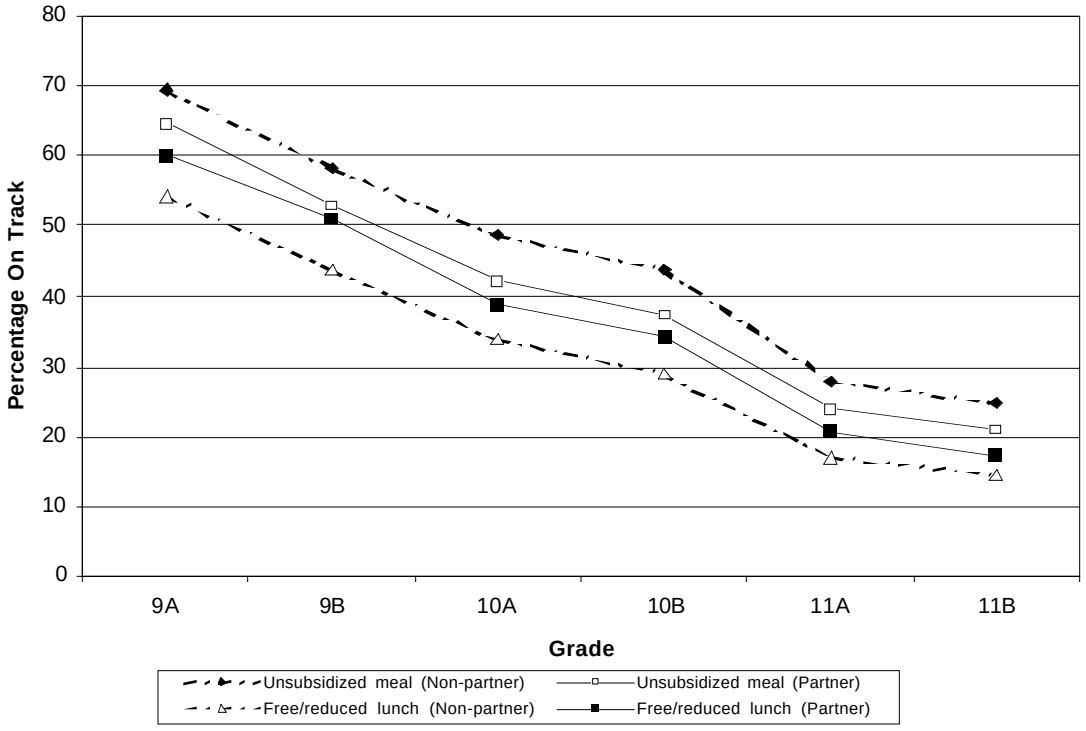

Figure 2-16. Proportion of students on-track by free/reduced meal and partnership school (total sample).

Figure 2-16 shows four different groups of students: those receiving free/reduced lunch who finished all six semesters from the fall of the ninth grade, both from the partnership and non-partnership schools. We see from

Figure 2-16 that students who pay the full amount for their meals display higher on-track rates than those who receive free lunch or pay a partial amount. The difference of the on-track rate between these two groups for the partnership schools is about 4%, while the gap for the non-partnership schools is 15%. The non-partnership school students who pay for their meals exhibit a higher on-track rate across all six semesters, starting at 69% in the first semester and remaining on-track at 25% at the end of the 11th grade. Only 15% of the students receiving free/reduced meals, however, remain on-track at the end of the same period. The partnership school students who fully pay for their meals display a higher on-track rate as well, although the difference compared to those who receive free/reduced lunch is only 4%.

Comparing the unsubsidized groups for the partnership and non-partnership schools, we notice that the former displays an on-track rate of about 4 – 5% lower than the latter. The partnership students paying for their lunch, for example, remain on-track at the rate of 21%, compared to 25% for the non-partnership students at the end of the 11th grade. The subsidized groups, on the other hand, show the reverse. The partnership students receiving free/reduce lunch exhibit a higher on-track rate by 3 – 6% than those who fully pay for their lunch.

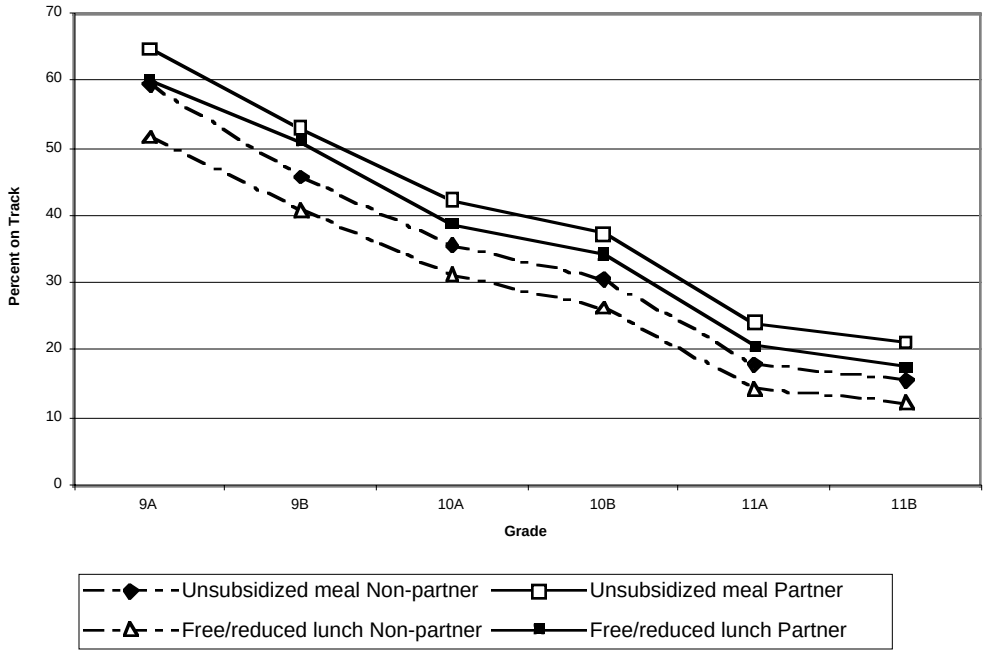

Figure 2-17. Proportion of students on-track by free/reduced meal and partnership school (matched sample).

Figure 2-17 shows free/reduced meal status by partnership school status in the matched sample. Note that the partnership school students receiving free/reduced lunch now display a higher on-track rate than the unsubsidized group from the non-partnership schools. Hence, both groups of the partnership schools show a higher on-track rate in this matched sample. Additionally, the disparity between the two groups of the non-partnership schools is reduced from 10 – 15% to about 3%. In other words, in this matched sample, the non-partnership school students who receive free/reduced lunch display about a 10% lower on-track rate than those in the total sample.

The free/reduced lunch status resembles the general pattern of students falling off-track, a faster decline during the first three semesters and the fifth semester than the rest. However, the order of the four groups shown in the graph differs from other student characteristics. Both partnership school groups (i.e., students receiving free/reduced lunch and fully paying) display a higher on-track rate than the non-partnership school groups, whereas other variables show the "high groups" (e.g. English proficient, attending more than 75 days, White/Asian/Filipino) of the partnership, then the non-partnership schools.

Algebra 1 Completed in Grade 8

Figure 2-18 shows four groups of students who are on-track: those who completed Algebra 1 in the eighth and those who did not, attending either the partnership or non-partnership schools. Those who completed Algebra 1 in the eighth grade are qualified to take geometry in the ninth grade, and the subsequent math courses thereafter. These students may well have been identified as gifted in elementary or middle school, and thus may have been encouraged to take advanced math courses.

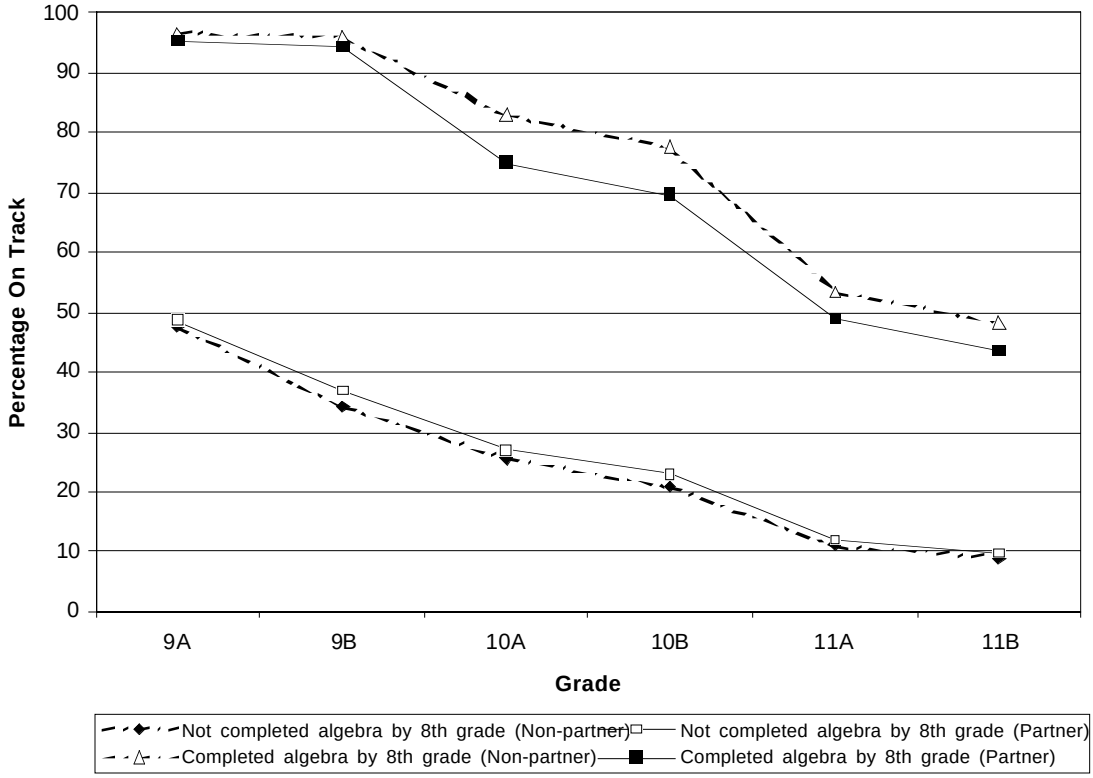

Figure 2-18. Proportion of on-track students by Algebra 1 completion in Grade 8 and partnership school (total sample).

Since the benchmark courses for A-G requirements start in the ninth grade, the rate of completion of algebra one year early can be a good predictor of high school math performance. Indeed, more than 95% of the students who took and passed Algebra 1 in the eighth grade begin their high school career on-track for the UC system. Over 40% of these students remain on-track at the end of 11th grade. This is a very high proportion of students compared to only 10% of the students who did not take the course but remained on-track. However, the rate of decrease seems to be more pronounced than graphs showing other variables. For instance, the students who took Algebra 1 in the 8th grade display a steeper decline between the 9th and 10th grades and again between 10th and 11th grades. Compared to the typical pattern, many more students who completed Algebra 1 in Grade 8 fall off-track between grades, and fewer within the same grade. Moreover, this pattern is different from the typical pattern in that the rate of decline is much flatter from the end of the fall to the end of the spring semester in Grade 9. That is, over 90% of the partnership and non-partnership school

students who completed Algebra 1 a year early stay on-track until the fall of the 10th grade, at which time about 20% of these students fall off-track. It is in this period that we start to see a disparity between the partnership and non-partnership schools because the former shows a more drastic decline than the latter. The difference between the two groups remains until the end of the sixth semester, at which time the non-partnership school students display a higher on-track rate by 5% than the partnership school students.

However, the students who did not complete Algebra 1 in the eigth grade show a steady but slow decreasing pattern of on-track status. Both the partnership and non-partnership school students remain on-track at 50% at the end of the first semester and 10% at the end of the sixth. Although the difference is minimal by the partnership school status, a disparity close to 40% exists between those who completed Algebra 1 before the ninth grade and those who did not. Therefore, completing Algebra 1 can be an excellent predictor of being on-track since all students who completed Algebra 1 before high school display over 45% of the on-track rate at the end of the 11th grade.

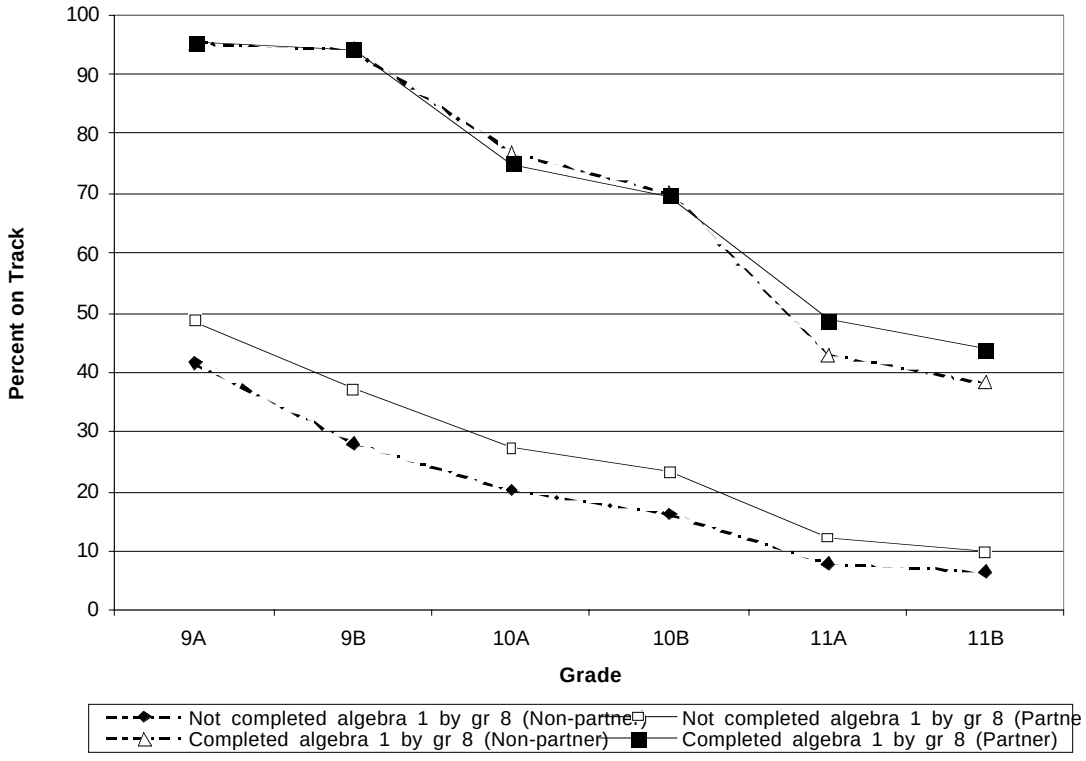

Figure 2-19. Proportion of on-track students by Algebra 1 completion in Grade 8 and partnership school (matched sample).

Figure 2-19 shows the Algebra 1 completion status in the matched sample. When we match the non-partnership schools that have characteristics similar to the partnership schools, the non-partnership school students who completed Algebra 1 display a 5% lower on-track rate than the partnership school students. Hence, the difference of the on-track rate for the non-partnership schools between the unmatched (total sample) and the matched non-partnership schools is close to 10%. Thus, what seems to be a significant difference in the total sample turns out to be no difference for the completion group since the students who completed Algebra 1 a year early show nearly an identical proportion of decrease for the first four semesters until the end of the 10th grade. At the end of the 11th grade, however, the partnership students display a higher on-track rate in the matched sample. Additional difference lies in the matched non-partnership schools. The students attending the non-partnership schools have a lower rate of being on-track than those in the total sample. Further, the gap between the partnership and non-partnership students who did not complete the course a year early widened from about 1% across all semesters in the total sample to 3% - 7% in the matched sample.

Algebra 1 Completion in Grade 9

Most students take Algebra 1 by the ninth grade in high school. Since math courses tend to build on the previous courses, not taking Algebra 1 by Grade 9 can mean being off-track with little possibility of being back on-track at a later time.

Figure 2-20 shows four groups of students: the partnership and non-partnership students who completed Algebra 1 in Grade 9, and those who did not. Note that the students who completed the course remain on-track at a rate of more than 30% at the end of the 11th grade in the total sample, but none of those who did not complete the course is on-track at the end of the 9th grade. Further, of those who completed the course, the non-partnership school students display 2% – 3% higher rate of being on-track than the partnership school students. The partnership school students who did not complete Algebra 1 by the ninth grade decrease at the same rate as their counterpart, and as mentioned previously, all in this group fall off-track by the end of the ninth grade.

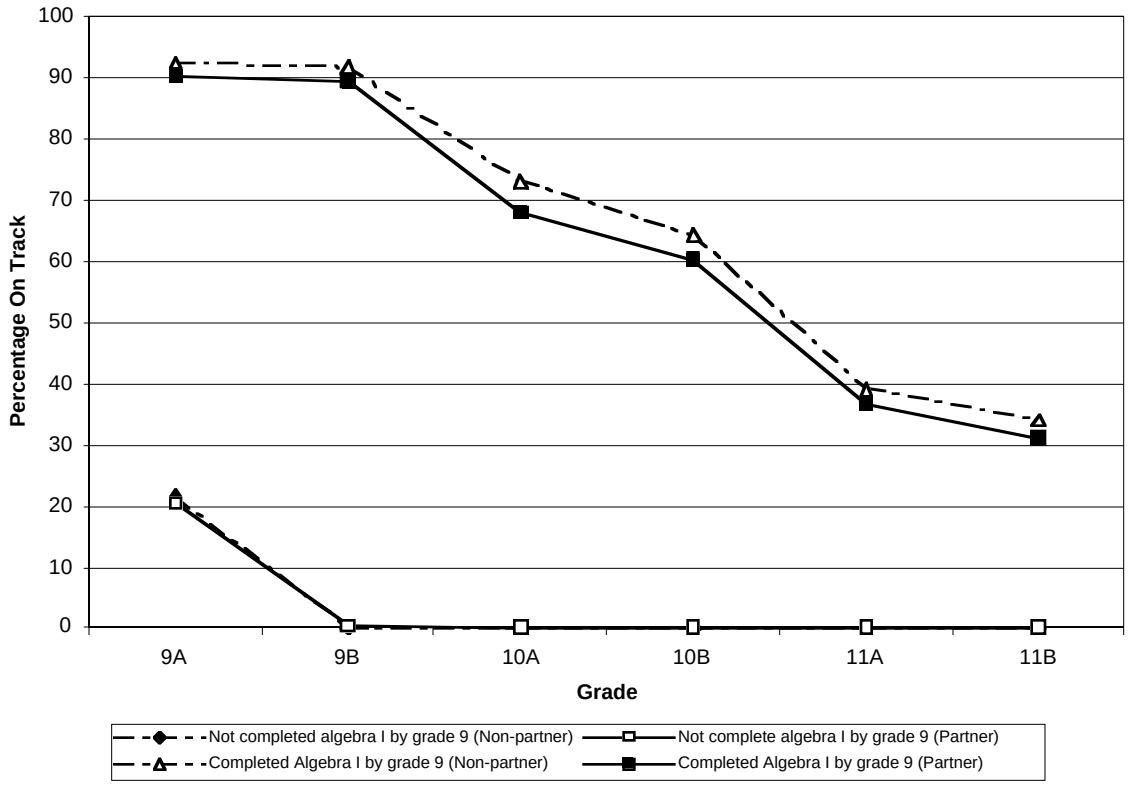

Figure 2-20. Proportion of on-track students by Algebra 1 completion and partnership school (total sample).

In contrast to the total sample shown in Figure 2-20, the students attending the matched non-partnership school display, in Figure 2-21, a lower on-track rate than those attending the partnership school. The gap is small in the first two semesters, but it widens to about 4% at the end of the 11th grade. However, as in the previous graph, the gap between the students who completed the course and those who did not remains the same at about 30%. Moreover, the latter in the matched sample displays the same on-track rate of zero percent for most of the semesters, as does the total sample.

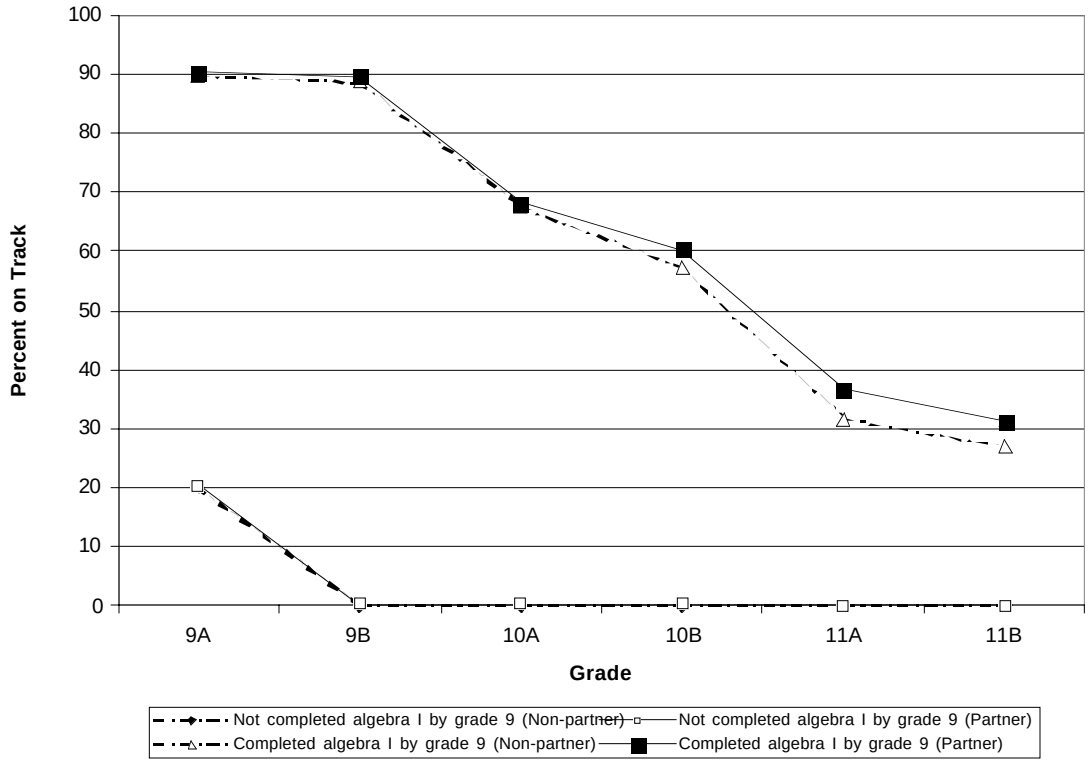

Figure 2-21. Proportion of on-track students by Algebra 1 completion and partnership school (matched sample).

Algebra 1 Course Grade

Figure 2-22 shows the proportion of students at each semester who took Algebra 1 and received a high course grade (A or B) or a low grade (C, D, or F) in the total sample of the non-partnership schools. As with all other students represented in the graphs of the featured variables, the students in this plot finished all six semesters through the end of the 11th grade. The four groups of students are those who received the high-grade and low-grade at the partnership schools and the same two categories at the non-partnership schools.

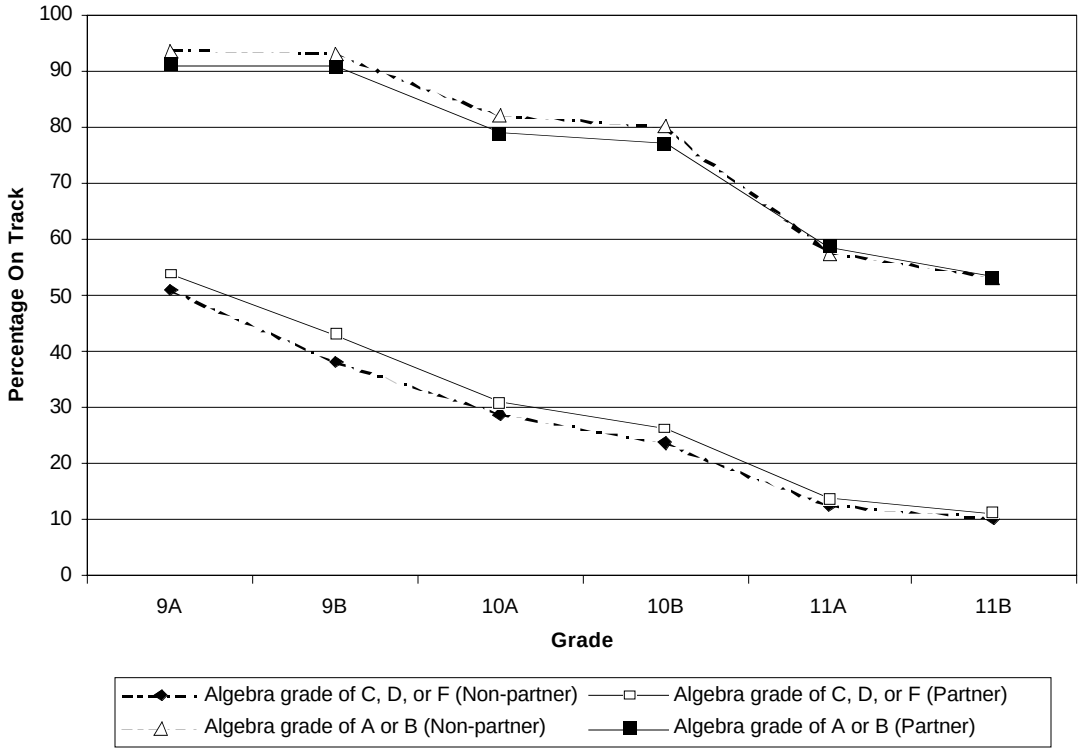

Figure 2-22. Proportion of on-track students by HIGH algebra grade and partnership school (total sample).

From the graph, it is clear that those who received an A or B for the final semester grade show a much higher rate of staying on-track than those who received a "C" or below. Approximately 92% of the high-grade group stayed on track at the end of the first semester of high school, compared with 50% of the lower group. Their ending points also show a large gap. More than 50% of the students who received higher grades remain on-track at the end of the 11th grade, while only 10% of the students who received lower grades is on-track.

Moreover, there is very little difference between the partnership and non-partnership school students for the high- and low-grade groups. For the students who received a high grade in the course, the non-partnership students show a 1.5% higher rate of being on-track during the first four semesters, but they end with the same on-track rate as the partnership school students at the end of the 11th grade. For the students who received a lower grade, the partnership school students display a little higher rate of being on-track, but they also finish at the same rate as the non-partnership school students.

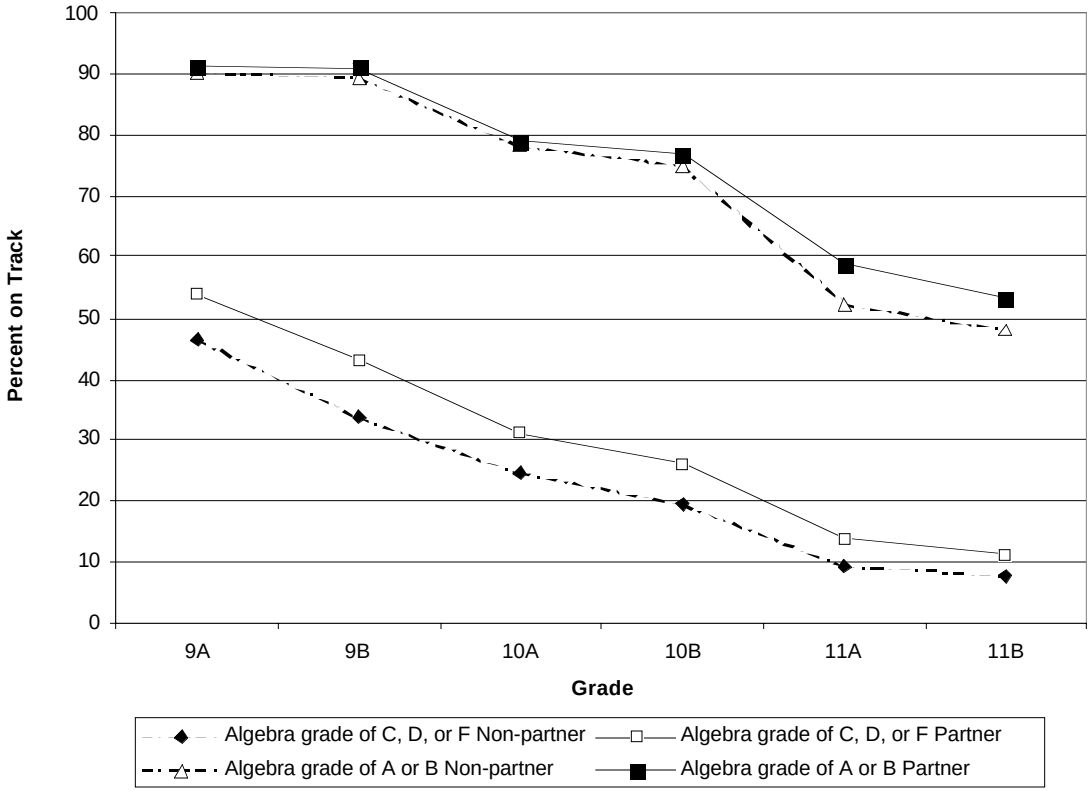

Figure 2-23. Proportion of on-track students by HIGH algebra grade and partnership school (matched sample).

In the matched sample, the partnership school students show a higher rate of being on-track across all semesters, for both high- and low-grade groups (Figure 2-23). For the high-grade groups, the gap between the partnership and non-partnership schools starts with 1% in the first semester, but it increases to 5% at the end of the 11th grade. Note, however, that both groups exhibit the on-track rate of 50%. For the low-grade group, the gap is wider at the beginning and decreases to about 3.5% in the last semester. They average about 10% of being on-track at the end of the 11th grade.

A similar pattern is found for the students who completed Algebra 1 in Grade 8 and the students who received higher algebra grades. That is, there is a sharper decline of more than 20% between 9th and 10th grades, and again between 10th and 11th grades. Further, hardly any decrease (1%) occurs from the fall to the spring semester in the ninth grade. The students who received lower grades, however, show a slower and steadier decrease. It is also important to note that although about half of both high- and low-grade groups fall off-track since the

middle of the ninth grade, a gap of more than 40% is maintained across all semesters, a huge advantage for the students who received a grade of A or B in Algebra 1.

Geometry Completion

Geometry is the next course after Algebra 1 in the math sequence. Since the high school mathematics courses are to be taken sequentially, the students who did not take or failed Algebra 1 are not qualified to take geometry in the next semester.

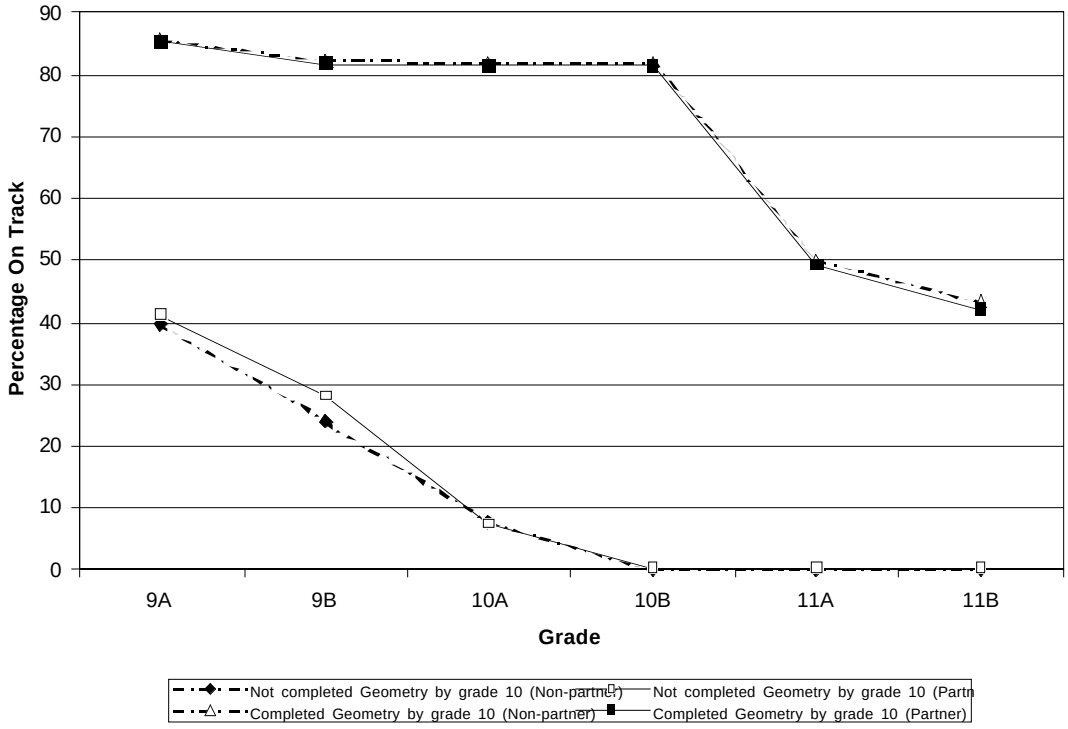

Figure 2-24. Proportion of on-track students by geometry completion and partnership school (total sample).

As with Algebra 1 completion, a large disparity exists between the students who completed geometry and those who did not (Figure 2-24). The rate of being on-track for the students who completed geometry is about 85% after the first semester, while those who did not take or complete the course is 40%. The 45% gap at the beginning increases as much as 80% by the end of the 10th grade, and ends with 40% at the end of six semesters. Further, the students who completed geometry by the end of the 10th grade display a rate of being on-track at a little more than 80% until the end of the 10th grade, at which time the other group

(those who did not complete the course by the end of the 10th grade) falls to 0% of being on-track. The former group shows about a 40% decline of the on-track rate since the end of the 10th grade, whereas the latter group exhibits a 40% fall up to the beginning of the 11th grade. Additionally, there is no difference between the partnership and the non-partnership school students, except for the incomplete group during the ninth grade. The disparity, however, is less than 5%. We can see, therefore, that the students who completed geometry by the 10th grade, regardless of the partnership school status, show a much higher on-track rate than those who did not complete the course.

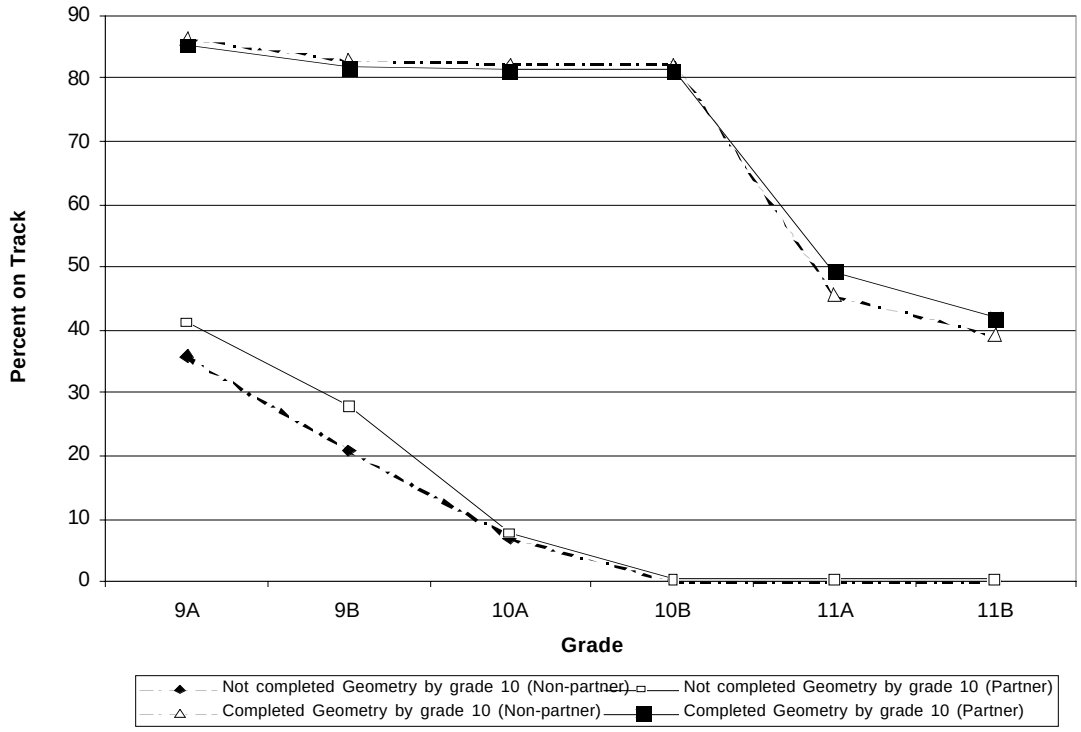

Figure 2-25. Proportion of on-track students by geometry completion and partnership school (matched sample).

Figure 2-25 shows the proportion of being on-track by geometry completion in the matched sample. Here, we see minimal differences of the on-track rates between the partnership and the non-partnership schools. For instance, during the first two semesters, the gap between those two groups of schools increased by 1 or 2% for the students who did not complete geometry. For those who

completed the course, a disparity increased during the last semester from 0% to about 4%, with the partnership schools showing a higher on-track rate.

Geometry Course Grades

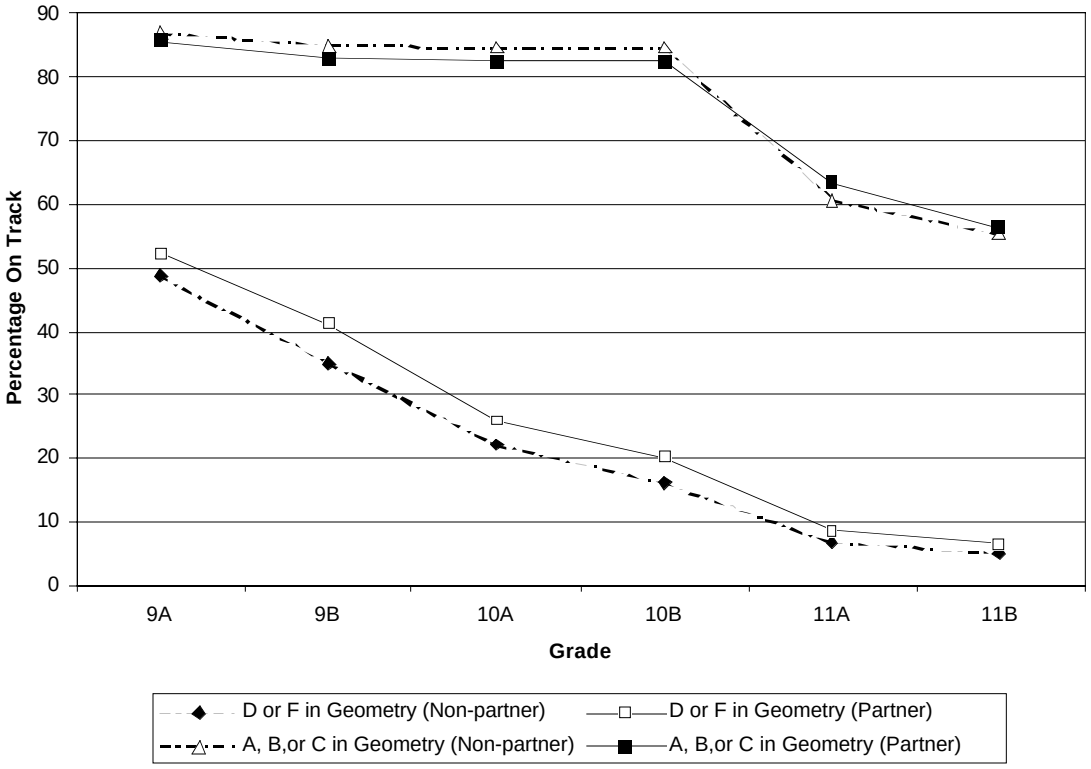

Figure 2-26. Proportion of on-track students by PASSING grade in geometry and partnership school (total sample).

Figure 2-26 shows two groups of students: those who received a passing grade of A, B, or C, and those who received a grade of D or F. Since being on-track requires students to receive a passing grade, we see a huge difference between this group and the group of students with a D or F. The students with a passing grade are on-track at the rate of 85%, which is 35% higher than those who received a lower grade of D or F. Their on-track rate remains the same until the end of the 10th grade before declining to 55% at the end of the 11th grade. Still, this is about 50% higher than the on-track rate for the students who received a lower grade. The lower-grade group falls off-track steadily until the middle of the 11th grade before the rate becomes flatter at less than 10%. Moreover, the trajectory of the higher-grade group resembles that of the students who completed geometry (Figures 2-24 and 2-25).

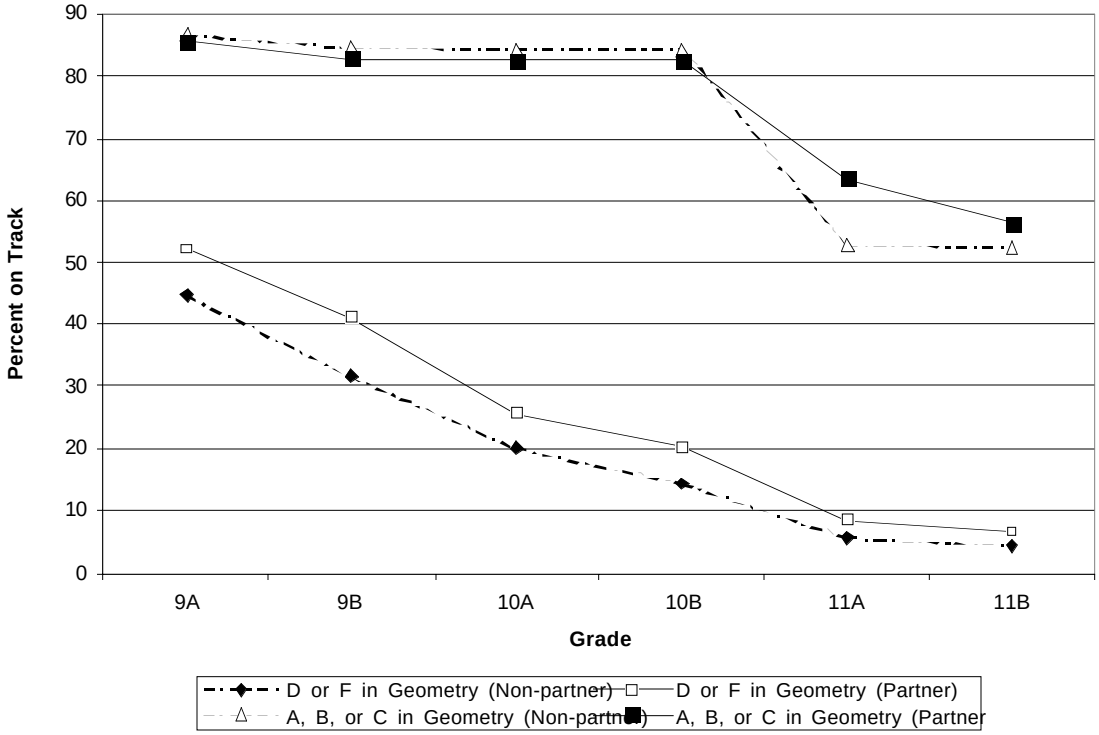

Figure 2-27. Proportion of on-track students by PASSING grade in geometry and partnership school (matched sample).

In the matched sample of the non-partnership schools (Figure 2-27), the on-track rate by the passing grade in geometry shows more difference between the partnership and the non-partnership schools. For the passing grade group, for example, the non-partnership school students fall off-track at a steeper rate during the first semester of the 11th grade and then plateau in the final semester, while the partnership school students display a steadier decline during the same period. The gap between the two groups is about 5% at the end of the 11th grade. However, the students who received a grade of D or F exhibit a different pattern. Their trajectories resemble the general pattern, and the non-partnership school students consistently show a lower rate of being on-track across all six semesters. The difference between the partnership and the non-partnership schools also increased compared to the gap in the total sample (Figure 2-26). A gap of 5.5% in the middle of the 9th grade remains about the same until the first semester of the 11th grade, at which time the difference decreases to a little more than 2%. The final rate of being on-track for the passing- and low-grade groups, however,

remains approximately the same as the one in the total sample, at 55% and 5% on average, respectively.

English 9 Completion in Grade 9

English 9 (ninth-grade English) is one of the benchmark courses for the ninth grade, indicating the on-track status of students in our analysis. We have found that more than two-thirds (68.2%) of our cohort took this course in their ninth-grade year, while only 42% took Algebra 1 in the same year.

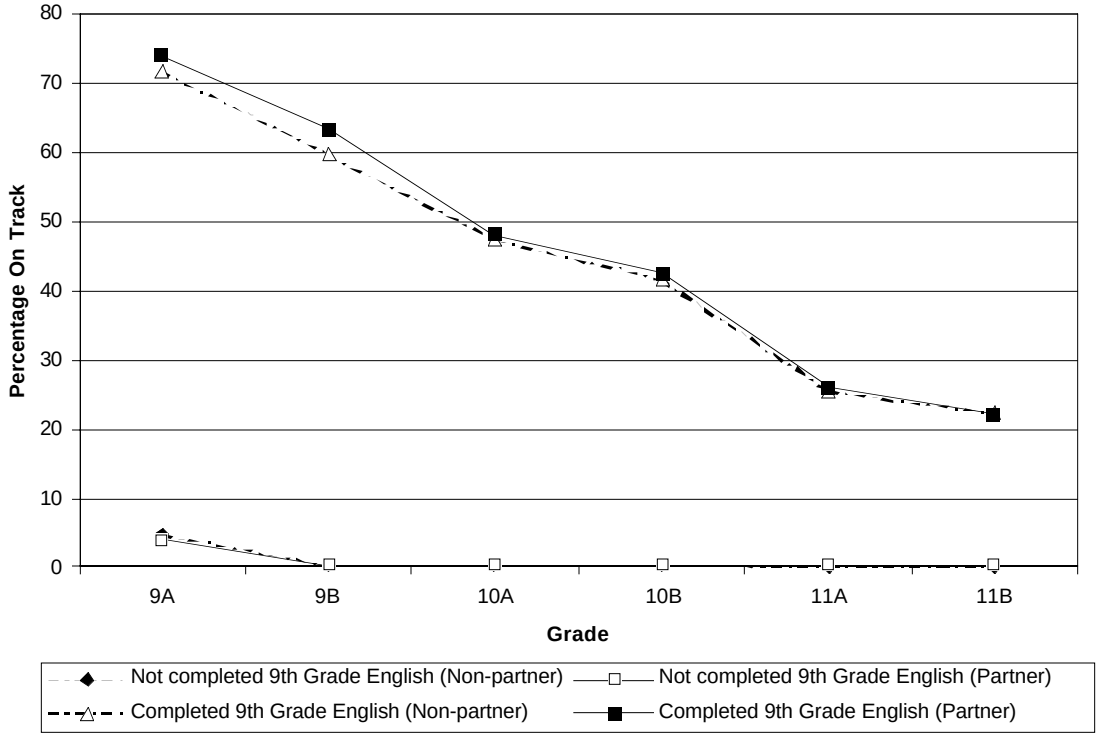

Figure 2-28. Proportion on-track of students by English 9 completion and partnership school (total sample).

As Figure 2-28 shows, very few students who did not complete English 9 remain on-track during the first two semesters, and none are on-track after that. On the other hand, a little more than 70% of those who completed English 9 is on-track after the first semester, and over 20% remains on-track after six semesters. There is virtually no difference between the partnership and the non-partnership schools, except that the non-partnership school students seem to

display a little lower on-track rate during the first three semesters. The trajectories for the students who completed and did not complete English 9, however, are vastly different. Those who completed the course display a more general pattern while those who did not complete the course exhibit a flat curve indicating zero starting in the 10th grade.

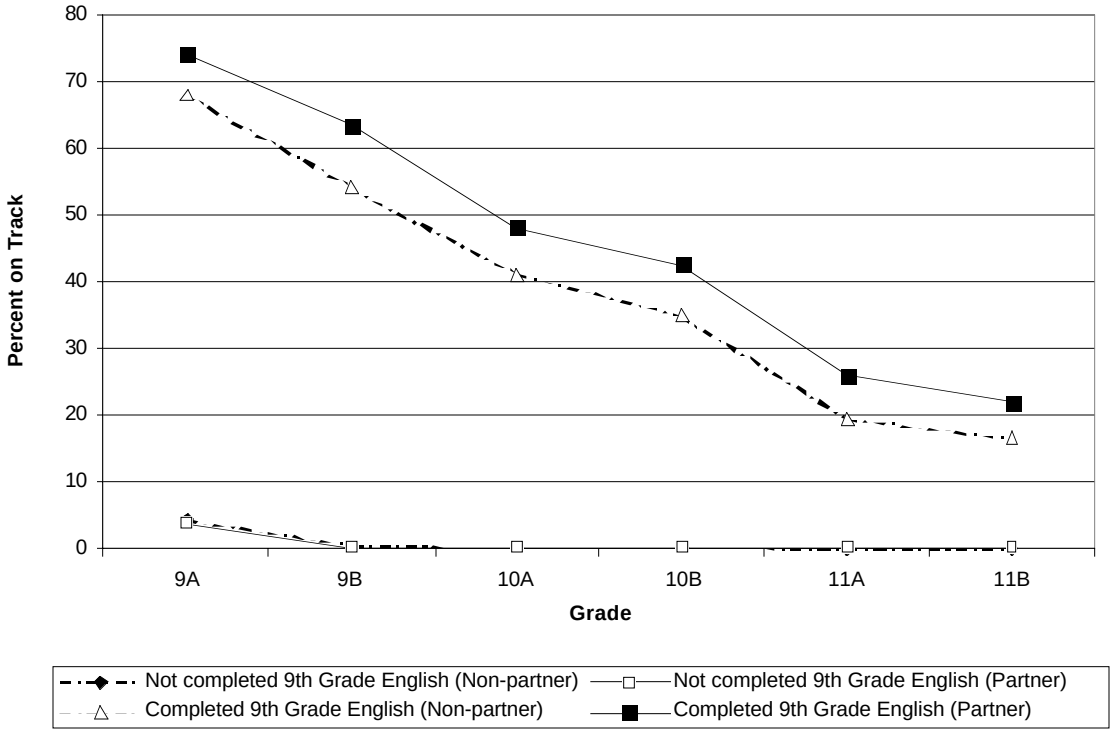

Figure 2-29. Proportion of on-track students by English 9 completion and partnership school (matched sample).

In the matched sample (Figure 2-29), we see that the matched non-partnership schools display a 5% lower on-track rate throughout the six semesters. Hence, by the end of the first semester, the non-partnership school students in this sample exhibit about a 68% on-track rate, which decreases to 16.5% at the end of the 11th grade. This disparity indicates that more partnership school students are on-track than the non-partnership school students under similar conditions of family income and ethnicity. The difference between these two groups for those who did not complete the English course is non-existent as in the total sample.

English 9 Course Grades

Figures 2-30 and 2-31 show English 9 course grades. As with Algebra 1 course grades, the students are grouped into those who received a grade of A or B, and those who received a grade of C, D, or F. Both graphs display similar trends as the Algebra 1 grades shown previously.

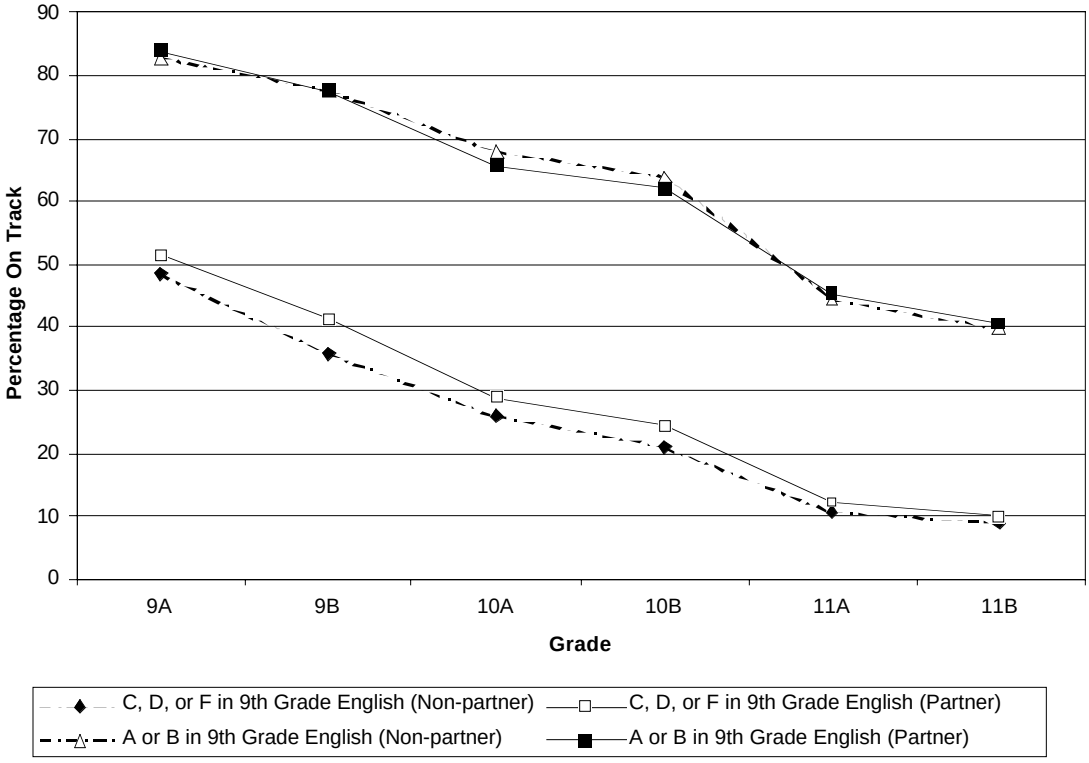

Figure 2-30. Proportion of on-track students by HIGH grade in English 9 and partnership school (total sample).

It is clear from Figure 2-30 that the students who received a higher grade have a much higher percentage of being on-track, with a difference of over 30% across all six semesters. The trajectories of both groups follow the general pattern: faster drops occur until the middle of the 10th grade, followed by a flatter slope until the end of the 10th grade, then a steep slope between the end of the 10th and the middle of the 11th grade, and finally a leveling off in the last semester. There is very little difference between the partnership and non-partnership schools for either the high- or low-grade group in this total sample including all the non-partnership schools. At the end of the 11th grade, therefore, the students who received a grade of A or B display about 40% of the on-track rate, while

those who received a grade of C, D, or F exhibit only about 10% of the on-track rate.

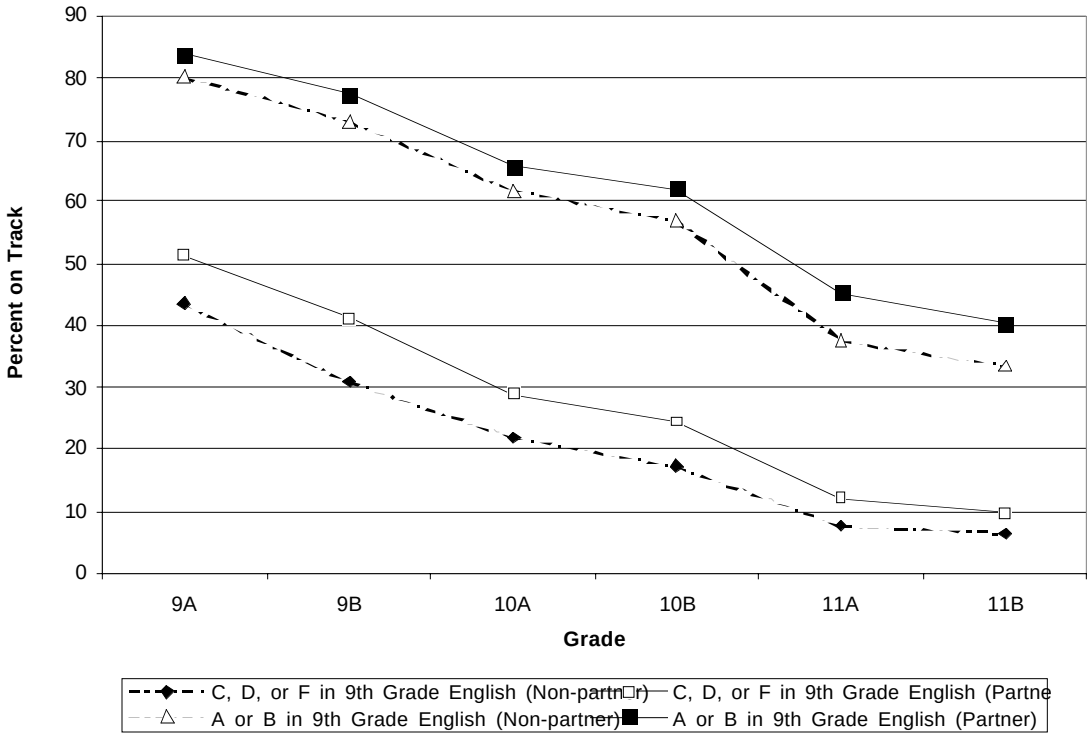

Figure 2-31. Proportion of on-track students by HIGH grade in English 9 and partnership school (matched sample).

As in the other graphs describing the matched non-partnership schools, Figure 2-31 shows the gaps between the partnership and the non-partnership schools in the matched sample. What seem to be negligible differences in the total sample now appear as significant differences of over 7% in the matched sample of the high-grade groups. The low-grade groups also exhibit a larger gap of 8% after the first semester and 3.5% after the last semester. Hence, the partnership schools seem to have more students who are on-track across all semesters, when compared to the non-partnership schools matched in some student characteristics with the partnership schools.

Summary of Descriptive Results

In summary, the proportion of students remaining on-track decreases every semester for all student characteristics and levels of academic performance in the benchmark courses throughout their high school career. However, several

patterns of decline emerge depending on these characteristics. The general pattern for most of the students, both the partnership schools and the non-partnership schools, exhibits a faster decrease until the middle of the 10th grade, a slower decline between the fall and spring semesters in the 10th and 11th grades, and a sharp decrease between the spring semester of the 10th and the fall of the 11th grade, before leveling off in the last semester. Another pattern is one in which a sharp drop occurs in the first three semesters, followed by a much flatter decrease in the last three semesters, as in the case of the students who attended school fewer than 48 days. Yet another pattern is characterized by a relatively slow decline for the first three semesters, followed by a sharp drop between the 10th and 11th grades, as seen in the high-grade group of Algebra 1 grades. Finally, a significant pattern in terms of intervention is the group who did not complete some courses. The students who did not take or complete Algebra 1 or English 9 fell off-track by the end of the ninth grade. None of the students who did not take or complete geometry remained on-track after the 10th grade. This would also suggest that these students did not complete either Algebra 1 or English 9 at a later time in their high school because their on-track rate stays at zero after it has been reached.

The gaps between groups representing different categories need to be examined as well. The difference between male and female students who remain on-track is consistently small throughout the six semesters. The gap is also small between the students who receive free/reduced lunch and those who do not. However, the disparity between the students who received an A or B and those who received a C or below remains large in the case of Algebra 1 and English 9 grades. A large gap also exists between those who completed Algebra 1 a year early and those who did not, and also between those who completed the benchmark courses (e.g., Algebra 1, English 9, geometry, etc.) and those who did not.

Additionally, the differences between the partnership and the non-partnership schools vary with student characteristics. For instance, variables such as gender, participation in magnet schools, and the completion status and course grades of the benchmark courses show little or no difference between the partnership and the non-partnership schools. These graphs exhibit essentially two trajectories of male/female, magnet/non-magnet, completed/not completed, and high grade/low grade. However, the student characteristics such as

ethnicity, free/reduced lunch status, attendance rate, and English proficiency display noticeable differences of at least 5% between the partnership and the non-partnership schools. In most cases, these gaps are consistent throughout all six semesters, although the magnitude of the difference may vary a little. If, for example, 5% more of English proficient students are on-track than English learners by the end of the first semester, the gap of 5% is generally maintained throughout. Moreover, some variables exhibit a larger gap for the low on-track group such as English learners and those who attended school fewer than 75 days in a semester.

However, in the sample of the matched non-partnership schools, the disparity between the partnership and the non-partnership schools becomes larger in all variables. That is, when we match the partnership and the non-partnership schools according to income and ethnicity, we see that lower proportions of the students attending the matched non-partnership schools are on-track. Therefore, the numbers including all non-partnership schools and dropouts turned out to be misleading when comparing the two groups of schools. When only students who finished the 11th grade are compared, the students attending the partnership schools display a 5% higher rate of being on-track than those who are attending the matched non-partnership schools.

Expected Probabilities for Key Profiles of Student Characteristics

Since the outcome variable for this study is students' status of either on-track or off-track, it is appropriate to use logistic regression to predict their status in terms of probability. If multiple regression was used, the range of the outcome variable would likely be larger to such an extent that the results would not make sense. For example, for a two-level outcome variable with 0 and 1, multiple regression can yield negative values and/or the values greater than 1, both of which would be difficult to interpret. The resulting values of a logistic regression are in log odds, which can be converted to the expected probability of being on-track or off-track.

The log-transformed equation is sufficiently linear so that we can construct a linear regression equation. The following logistic regression equation is for the fall semester of the ninth grade. Included in the following equation are the partnership school status, ethnicity, attendance rate, gender, free/reduced lunch, and English proficiency.

$$Li = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta nXn_i$$

$$\hat{Li} = -1.300 + (0.477)partner + 0.300underrep + 0.543attend + 0.215gender - 0.005meal + 1.409lang$$

The logit ($\hat{Li}$) is based on the estimates of the above equation and is computed for different combinations of the variables. For example, one possible combination of a student might be:

- Attending a partnership school, so 1 is substituted for "partner"
- Belongs to an underrepresented ethnic group, hence 0 is substituted for "ethnic"
- Attended school more than 75 days, hence 1 is substituted for "attendance"
- Is male, hence 0 is substituted for "gender"
- Received free/reduced lunch, so 1 is substituted for "meal"
- Is English proficient, hence 1 is substituted for "lang"

Then the logit = -1.300+0.477(1)+0.300(1)+0.543(1)+0.215(0)-0.005(1)+1.409(1) = 1.124, can be changed into a probability that the students with the above profile will be on-track for a particular semester (the fall semester in the above illustration).

It turns out that the probability is 0.755. Thus the expected probability of remaining on-track for the **male** students attending a **partnership school**, who belong to an **underrepresented** ethnic group, attend school **more than 75 days**, receive a **free/reduced lunch**, and are **English proficient** would be approximately 76%. Of the 64 possible combinations, the following tables show 24 combinations selected for a meaningful comparison between partner and non-partner schools, as well as between different variables involved.

The following tables each list different combinations (profiles) of students' background characteristics in the matched sample of the non-partnership schools. As we argued in the beginning of the report, we believe that selecting the non-partnership schools similar in family income and ethnicity would provide a much better comparison between the two groups of school. Moreover, we focus on the groups of students at risk of falling off-track from being eligible for UC admission. They include the underrepresented students who receive free/reduced lunch. We then vary English proficiency, attendance rates, gender, and their partnership school status to examine the expected probabilities associated with the selected profiles. All possible profiles, including those using the total sample, can be found in Appendix B.

Table 3.1
Expected Probabilities of Being On-Track by Combinations of Background Variables.

	Background characteristics					*Expected probability of being on-track*				*Frequency*	
Pro-file No.	**Ethnic group**	**Days attended**	**Gender**	**Free/ reduced Lunch**	**English Pro-ficiency**	**Partnership school**		**Non-partnership school**		**No. of students**	**% within matched sample**
						Grade 9 fall	Grade 11 spring	Grade 9 fall	Grade 11 spring		
1	Underrep	> 75 days	Female	Yes	Proficient	*0.792*	*0.340*			1,039	6.11
2	Underrep	> 75 days	Female	Yes	Proficient			*0.703*	*0.217*	1,498	8.81
3	Underrep	> 75 days	Male	Yes	Proficient	*0.755*	*0.272*			974	5.73
4	Underrep	> 75 days	Male	Yes	Proficient			*0.656*	*0.167*	1,510	8.88
5	Underrep	< 75 days	Female	Yes	Proficient	*0.689*	*0.180*			912	5.36
6	Underrep	< 75 days	Female	Yes	Proficient			*0.579*	*0.106*	891	5.24
7	Underrep	> 75 days	Female	Yes	Proficient	*0.792*	*0.340*			1,039	6.11
8	Underrep	> 75 days	Male	Yes	Proficient	*0.755*	*0.272*			974	5.73
9	Underrep	> 75 days	Male	Yes	Proficient	*0.755*	*0.272*			974	5.73
10	Underrep	< 75 days	Male	Yes	Proficient	*0.526*	*0.079*			852	5.01
11	Underrep	> 75 days	Female	Yes	Proficient	*0.792*	*0.340*			1,039	6.11
12	Underrep	< 75 days	Female	Yes	Proficient	*0.689*	*0.180*			912	5.36

Table 3.1 shows some profiles of student characteristics. All are English proficient students who belong to historically underrepresented ethnic groups on UC campuses. Each profile represents a combination of student characteristics as explained earlier. For example, Profile 1 represents a student attending a partnership school whose ethnicity is underrepresented at the UC campus, who attended school more than 75 days in a semester, is a female, proficient in English, and receiving free/reduced lunch. Profile 2 represents a student whose characteristics are the same as Profile 1, but instead attends a non-partnership school. The table illustrates several important patterns. We see that the students with Profile 1 have a 34% probability of staying on-track at the end of the last semester, compared to 22% for the latter. Profiles 3 and 4 show that boys exhibit the same pattern, although their probabilities of remaining on-track are lower than girls. As we examine the probabilities in the table, in fact, we see that the female students generally have a higher probability of remaining on-track regardless of student characteristics. In addition, the disparity between males who attended school more than 75 days and those who attended fewer than 75 days is over 20% (Profiles 9 and 10), when all the other variables are held constant. The former display a 76% probability of being on-track in the first semester, compared to 53% of the latter. The probability gap of 20% remains consistent through the end of the 11th grade. However, females show less difference between the high and low attendance groups. The gap is about 10% at the end of the first semester, but it increases to 16% at the end of the last semester. Therefore, high attendance rates also show up as an important factor associated with a high expected probability of remaining on-track.

Comparing the partnership schools with the non-partnership schools, we find that the students in the partnership schools who attended fewer than 75 days in a semester also have about a 7.4% higher (18% vs. 10.6% from Profiles 5 and 6) expected probability than those attending a non-partnership school. From Table 3.1, it is clear that the gaps created by the partnership and the non-partnership schools average about 10% for the various profiles. Furthermore, these gaps are statistically significant and seem to provide an evidence of the effectiveness of the partnership school. Finally, each profile presented in Table 3.1 is associated with a number of students large enough to make up an annual

cohort in a high school, lending additional importance to the profiles and basis for a possible academic intervention.

Table 3.2
Expected Probabilities of Being On-Track by Background Variables.

	Background characteristics					*Expected probability of being on-track*				*Frequency*	
Pro-file No.	**Ethnic group**	**Days attended**	**Gender**	**Free/ reduced Lunch**	**English Pro-ficiency**	**Partnership school**		**Non-partnership school**		**No. of students**	**% within matched sample**
						Grade 9 fall	Grade 11 spring	Grade 9 fall	Grade 11 spring		
13	Underrep	> 75 days	Female	Yes	Limited	*0.482*	*0.096*			384	2.26
14	Underrep	> 75 days	Female	Yes	Limited			*0.366*	*0.054*	569	3.34
15	Underrep	> 75 days	Male	Yes	Limited	*0.429*	*0.072*			449	2.64
16	Underrep	> 75 days	Male	Yes	Limited			*0.318*	*0.040*	805	4.73
17	Underrep	< 75 days	Female	Yes	Limited	*0.351*	*0.043*			695	4.09
18	Underrep	< 75 days	Female	Yes	Limited			*0.251*	*0.024*	533	3.13
19	Underrep	> 75 days	Female	Yes	Limited	*0.482*	*0.096*			384	2.26
20	Underrep	> 75 days	Male	Yes	Limited	*0.429*	*0.072*			449	2.64
21	Underrep	> 75 days	Male	Yes	Limited	*0.429*	*0.072*			449	2.64
22	Underrep	< 75 days	Male	Yes	Limited	*0.213*	*0.017*			664	3.90
23	Underrep	> 75 days	Female	Yes	Limited	*0.482*	*0.096*			384	2.26
24	Underrep	< 75 days	Female	Yes	Limited	*0.351*	*0.043*			695	4.09

Table 3.2 shows the same student characteristics as Table 3.1 except the "limited" category of English proficiency. In other words, the table provides information on the English learners rather than fluent English speakers. It is clear that the English learners show much lower expected probabilities than the proficient English speakers. At the end of the first semester, for instance, only 48% of the Profile 13 students is expected to stay on-track, compared to 79% for the Profile 1 students, who have the same characteristics except for their fluent English proficiency. This is a 31% difference. Further, at the end of the last semester, the students limited in English proficiency show about 10% probability of remaining on-track, compared to 34% for the fluent speakers of English, a gap of 24%. The disparities between these two groups of students (31% and 24%), in fact, are greater than the gap between the high and the low attendance group

shown in both Table 2.1 and 2.2, which range from 5% to 23%. Therefore, being limited in English seems to be as significant a factor in having more students remain on-track as is attending more than 75 days in a semester.

In addition to the lower expected probabilities, Table 3.2 displays diminished differences between the partnership and the non-partnership schools. For underrepresented female students who attend school for more than 75 days in a semester, receive free/reduced lunch and are fluent English speakers (Profiles 1 and 2), the gaps between the partnership and the non-partnership schools range from 8% to 13% at the end of the last semester. For the English learners with the same characteristics, however, the differences range from 2% to 4%. Another interesting finding is that these gaps are wider for the English speakers at the end of the 11th grade, but the English learners have the wider gaps at the end of the 9th grade, when partnership and the non-partnership schools are compared (See Profiles 1-6, 13-18). Hence, the effectiveness of the partnership schools in guiding more students to remain on-track seems greater with the proficient English speakers rather than the English learners.

In summary, then, being able to speak English fluently seems to impact the expected on-track probabilities the most, followed by the differences in attendance rate. The disparities of English proficiency can be as high as 24% for the partnership schools and 16% for the non-partnership schools at the end of the 11th grade. The gaps for the attendance rate range from 5% to 19% for the same period. The differences caused by the partnership school status are not as dramatic, and the gaps seem to be more prominent among the English proficient students. Finally, gender differences seem to be augmented with the group of students attending school fewer than 75 days, regardless of English proficiency.

Table 3.3

Expected Probabilities of being on-track by background variables and Algebra 1 grades.

Profile No.	Partnership Status	English Proficiency	Gender	Algebra 1 Grades	Geometry Grades	Probability of being on-track		Frequency	% Freq
	Non-partner	Limited	male	D or F	D or F	Semester	Semester	Within matched	Within matched
	Partnership	**Proficient**	**female**	**C or better**	**C or better**	9A	11B	sample	sample
1	Non-partner	**Proficient**	**Female**	**C or better**	**C or better**	***0.956***	***0.674***	482	2.66
2	Non-partner	**Proficient**	Male	**C or better**	**C or better**	***0.951***	***0.635***	370	2.04
3	**Partnership**	**Proficient**	**Female**	**C or better**	**C or better**	***0.966***	***0.745***	534	2.95
4	**Partnership**	**Proficient**	Male	**C or better**	**C or better**	***0.963***	***0.710***	408	2.25
5	**Partnership**	**Proficient**	**Female**	**C or better**	D or F	***0.932***	***0.263***	430	2.38
6	**Partnership**	**Proficient**	Male	**C or better**	D or F	***0.925***	***0.231***	351	1.94
7	Non-partner	**Proficient**	**Female**	**C or better**	D or F	***0.911***	***0.202***	504	2.79
8	Non-partner	**Proficient**	Male	**C or better**	D or F	***0.903***	***0.176***	374	2.07
9	**Partnership**	**Proficient**	**Female**	D or F	**C or better**	***0.737***	***0.300***	156	0.86
10	**Partnership**	**Proficient**	Male	D or F	**C or better**	***0.717***	***0.265***	156	0.86
11	Non-partner	**Proficient**	**Female**	D or F	**C or better**	***0.679***	***0.233***	156	0.86
12	Non-partner	**Proficient**	Male	D or F	**C or better**	***0.656***	***0.204***	135	0.75
13	**Partnership**	**Proficient**	**Female**	D or F	D or F	***0.573***	***0.050***	1,337	7.39
14	Non-partner	**Proficient**	**Female**	D or F	D or F	***0.503***	***0.036***	2,105	11.63
15	Non-partner	**Proficient**	Male	D or F	D or F	***0.477***	***0.030***	2,208	12.20
16	**Partnership**	**Proficient**	Male	D or F	D or F	***0.548***	***0.042***	1,452	8.02

Table 3.3 shows Algebra 1 and geometry course grades with the partnership school status, English proficiency, and gender. The course grades have one category of A, B, or C, and the other category of D or F. We will also refer to these categories as passing and non-passing grades, although D is not technically a failing grade. (However, the UC requirements recommend that a student repeat the course in which he received a grade of D or F.) From the table we notice that the students who completed both math courses with a C or better have the highest probabilities of staying on-track (Profiles 1-4). Of these students, in addition, those attending a partnership school, or female students display higher

probabilities in both the first and the last semesters. For instance, 74.5% of female students from this group (Profile 3) is expected to remain on-track at the end of the 11th grade, compared to about 67% of the non-partnership school students (Profile 1). The students who received a D or F in both math courses expectedly show the lowest probabilities of being on-track in both semesters (Profiles 13-16). A little more than half remain on-track after the first semester for this group, and less than 5% is on-track at the end of the last semester. As with the students who completed both math courses with a passing grade, attending the partnership schools and being female do increase the expected probabilities of remaining on-track.

Another group of students displayed in Table 3.3 is those who received a passing grade in Algebra 1, but a non-passing grade in geometry (Profiles 5 – 8). They display high probabilities similar to those of the first group (Profiles 1-4) in the first semester, but much lower probabilities (18% - 26%) in the last semester. They are likely not to have taken algebra 2 or have received a poor grade after already receiving a D or F in geometry. Thus, many such students may have fallen off-track after completing geometry. Further, as with the previous two groups, the partnership school students and female students exhibit a little higher probabilities. The last group (Profiles 9 –12) is most interesting since these students received a non-passing grade in Algebra 1 but managed to get a passing grade in the next course. Their expected probabilities in the first semester (66% - 74%) are not as high as of those who received a passing grade in Algebra 1 (90% - 93%), but they display 3% - 4% higher probabilities in the last semester, compared to the students who received a passing grade in Algebra 1, but a D or F in geometry. Although these students are smaller in number, they provide a different path of remaining on-track, some of which need to be explored in later analyses. Finally, the partnership school status and the female status increase the expected probabilities for these two groups (Profiles 5-8, 9-12) as well.

Survival and Hazard Probability Functions

In addition to looking at the frequencies of on-track students for different variables, we can consider the probability that a student falls off-track at a particular time period given that he was on-track in the previous period. The hazard probability, as it is called, is likely to be different at different time points and for different groups of students. In this section, a hazard function, the

chronological pattern of these hazard probabilities, will be presented. Similarly, a probability that a proportion of the students on-track who survive through the semesters can be obtained as the survival probability, the chronological pattern of which becomes a survival function. Hence, the relationship between the two functions is complementary. The higher the hazard probabilities are, the lower the corresponding survival rates. Conversely, the lower the hazard probabilities are, the higher the corresponding survival probabilities.

Using the hazard and survival functions, we can pose the following questions:

- How long does an average student remain on-track?
- During which semester is the risk of falling off-track the highest?
- How does the risk at each time point (hazard probability) change over time?
- How does the probability of staying on-track (survival probability) for each student characteristic change over time?

Survival and Hazard Functions – Overall Picture

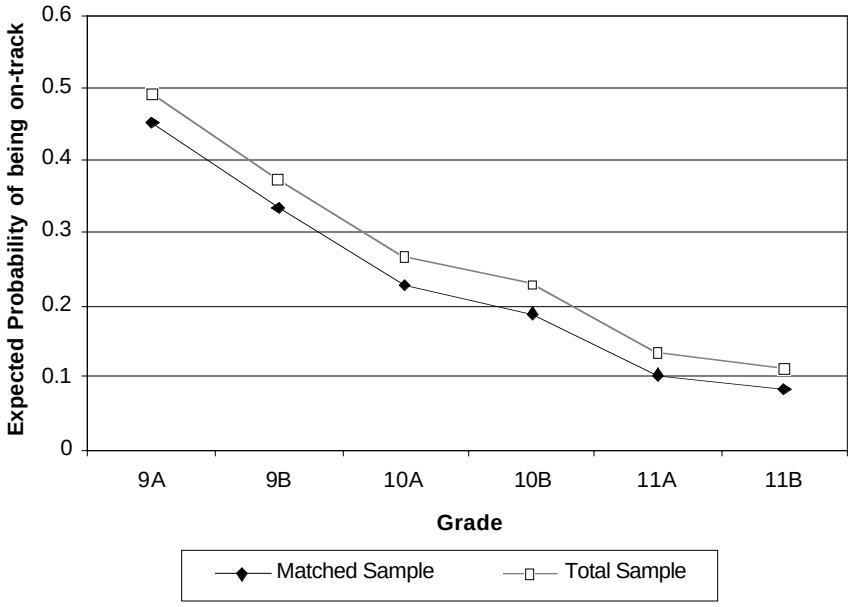

Figure 4-1. Overall survival function plot of the total and matched samples

Figure 4-1 shows the overall expected survival rate of all students in the total and matched sample. We can see that in the total sample, only half of the students at the end of the first semester is expected to survive or remain on-track. The expected rate of staying on-track declines quite rapidly until the end of the third semester. It slows down a little for the spring semester of Grade 10 until it again starts to decrease at a faster rate. Finally, the rate levels off in the last semester. This pattern, a rapid decline until the middle of the 10th grade and again during the first semester of the 11th grade, is reminiscent of the decreasing pattern of on-track proportions, referred to as the general pattern, presented in the previous section.

Table 4.1

Expected survival and hazard rate of remaining on-track in the total and matched samples.

Semester	Total sample		Matched sample	
	Survival probability	*Hazard probability*	Survival probability	*Hazard probability*
9A	.4905	*.5095*	.4518	*.5482*
9B	.3722	*.2412*	.3331	*.2628*
10A	.2664	*.2842*	.2264	*.3203*
10B	.2284	*.1426*	.1899	*.1611*
11A	.1329	*.4182*	.1040	*.4524*
11B	.1113	*.1626*	.0854	*.1788*

From Table 4.1, we notice that only a little more than 10% is expected to remain on-track, an estimate not far off when compared to the actual proportion of students remaining on-track at the end of the 11th grade. The trajectory of the matched non-partnership schools displays the same pattern, although its probabilities are expectedly lower. Approximately 45% of the non-partnership school students in the matched sample is expected to be on-track after the first semester of the ninth grade. This is about 4% lower than the rate in the total sample. At the end of the 11th grade, the expected rate of being on-track for the non-partnership school students decreases to 8.5%, a gap of 2.5% compared to the students in the total sample.

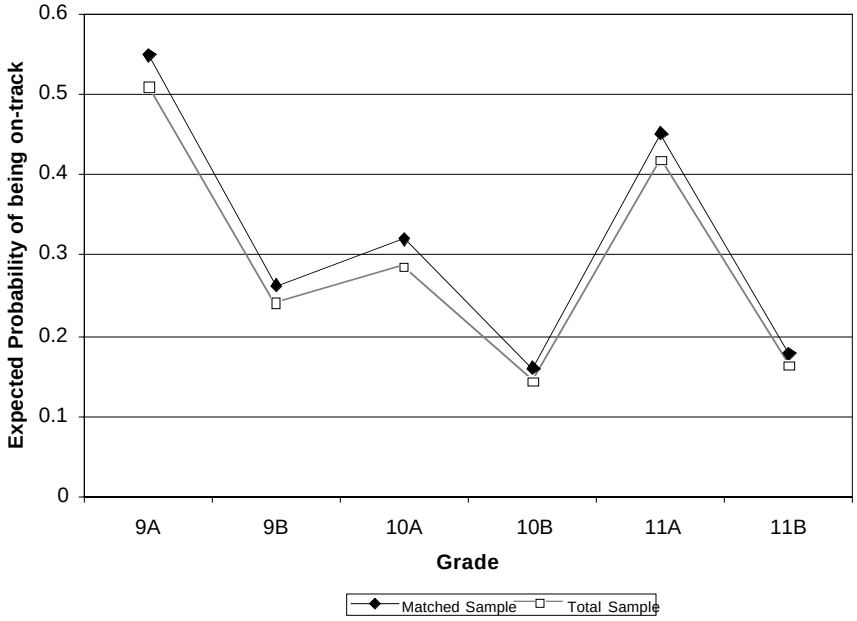

Figure 4-2. Overall hazard function plot of the total and matched samples

The corresponding hazard plot (Fig. 4-2 and Table 4.1) shows that the risk of being off-track increases greatly between 10th and 11th grade. We mentioned in the previous section that this period seemed to be critical because a high percentage of students fall off-track. Our concern is confirmed here in terms of risk. Another period of an increased risk is the first semester of the ninth grade. The highest hazard rate, it shows that more students are likely to fall off-track in this period than in any other. This period is another semester in which an intervention could be implemented. The third period of an escalating hazard rate is between 9th and 10th grade. This is the smallest of the three increasing hazard rates. On the other hand, we see that the hazard probability declines between semesters 9A and 9B, 10A and 10B, and 11A and 11B. These periods all represent the periods from the fall to the spring semester in the same academic year. Thus, we have an increasing risk from one grade to next, and a decreasing risk from the fall semester to the spring within the same grade. Moreover, we notice that the hazard probabilities of the matched sample are higher since its survival rate is lower.

Next, we examine the survival and the hazard functions by partnership status. Five groups of students are represented in Figure 4-3 and 4-4: the

students who finished the 11th grade at the partnership school; those who moved to a non-partnership school; dropouts from the partnership school; and the students who finished at the non-partnership schools in the total and the matched samples.

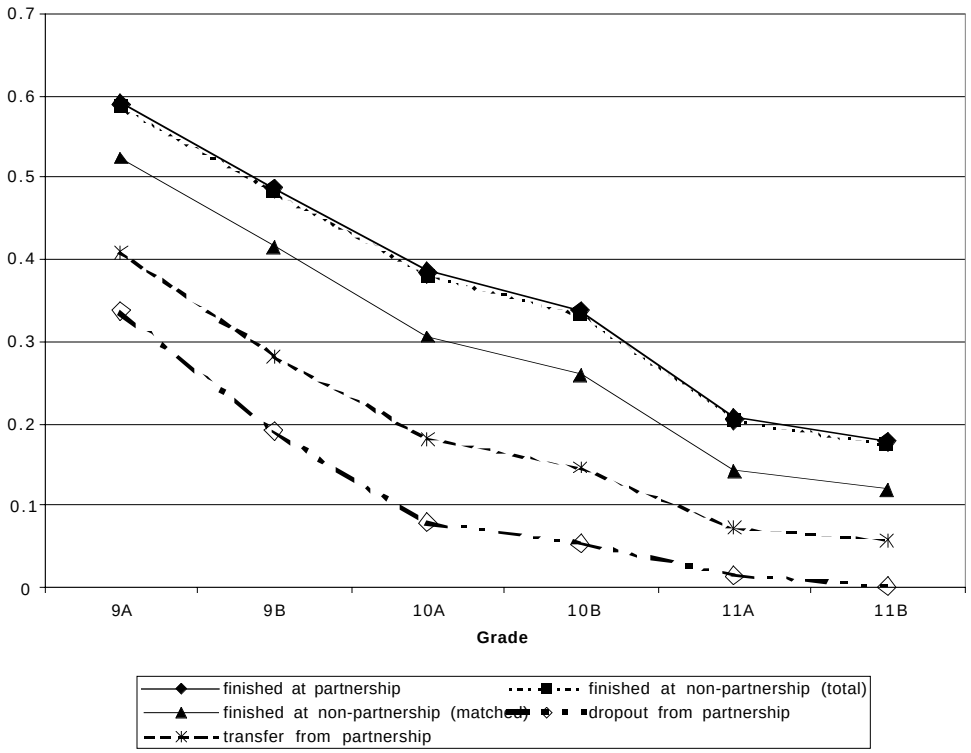

Figure 4-3. Survival function plot by partnership school status.

Figure 4-3 is very similar to Figure 2-1 and 2-2 in that the rates of decline nearly match the probabilities of being on-track. Further, the order of the trajectories is the same, with the partnership school students who stayed until the end of the 11th grade placed the highest and the dropouts taking the lowest position. Note also that the non-partnership school students in the total sample display virtually identical probabilities as their counterparts in the partnership schools. As with the proportions of being on-track, the students in the matched sample exhibit significantly lower expected probabilities than those in the total sample.

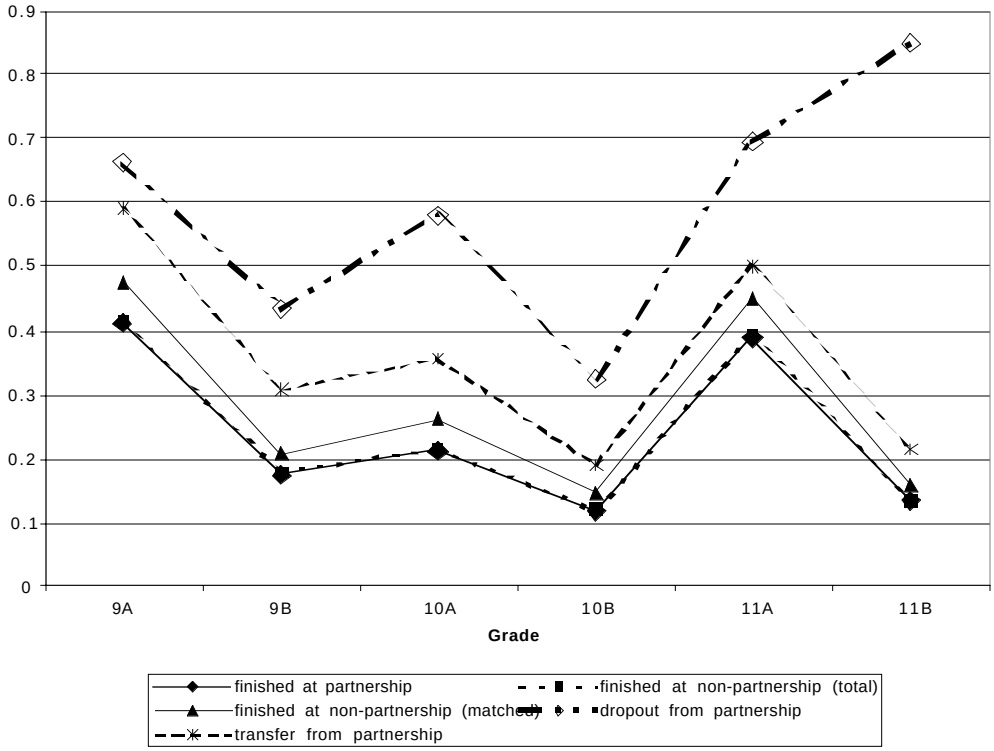

Figure 4-4. Hazard function plot by partnership school status.

Figure 4-4 shows the hazard probabilities by partnership status. The dropouts from the partnership schools expectedly show the highest probabilities of falling off-track across all six semesters. Moreover, it is notable that the hazard rate in the last semester for this group increases rather than decreases, as do all other groups and variables. It displays close to 90% probability of falling off-track at the end of the 11th grade, while other groups exhibit about 20% on average.

We will look at survival and hazard probabilities together for each student characteristic. To compare the most similar groups and to be consistent with the groups examined in the section on the frequency of being on-track by different variables, we examine only the students who finished all six semesters at the school in which they started their ninth grade. We exclude the students who dropped out of school and the partnership school students who transferred to a non-partnership school in this analysis. They are featured and explained in the beginning of the "Results" section. We distinguish among six groups of students: two categories (e.g., English proficient students or English learners) attending the partnership schools, the same two categories in the total sample of

the non-partnership schools, and the categories in the matched non-partnership schools. In the case of gender, for example, the six groups featured are: female and male in the total sample of the non-partnership schools, female and male in the matched non-partnership schools, and female and male at the partnership schools.

Gender

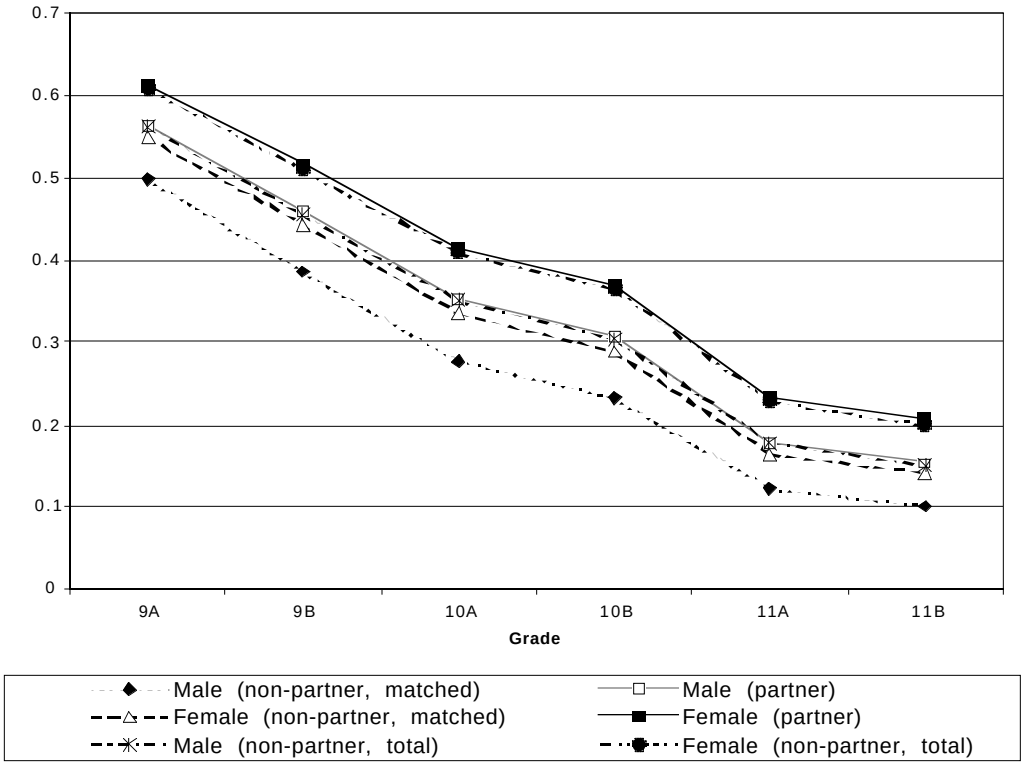

Figure 4-5. Survival function plot of gender and partnership school status.

The pattern of the expected survival rate for gender, shown in Figure 4-5, follows the survival pattern of all students quite closely. The graph shows that female students remain on-track at a higher rate by about 5% for all groups: the partnership schools, and both the total and the matched sample of the non-partnership schools. For the partnership school students, the expected rate of being on-track after the first semester is about 61% for females and 56% for males. As with the frequency of being on-track in the previous section, the rate of being on-track for the matched non-partnership schools are lower across all variables including gender. The expected rate of remaining on-track at the end of the first

semester for the students attending the matched non-partnership schools is about 55% for the girls and 50% for the boys. These rates decrease to 15% and 10%, for the girls and boys, respectively, which are still 5% lower than the students in the partnership schools. Additionally, note that the students in the total sample display virtually the same probabilities of being on-track as those in the partnership schools.

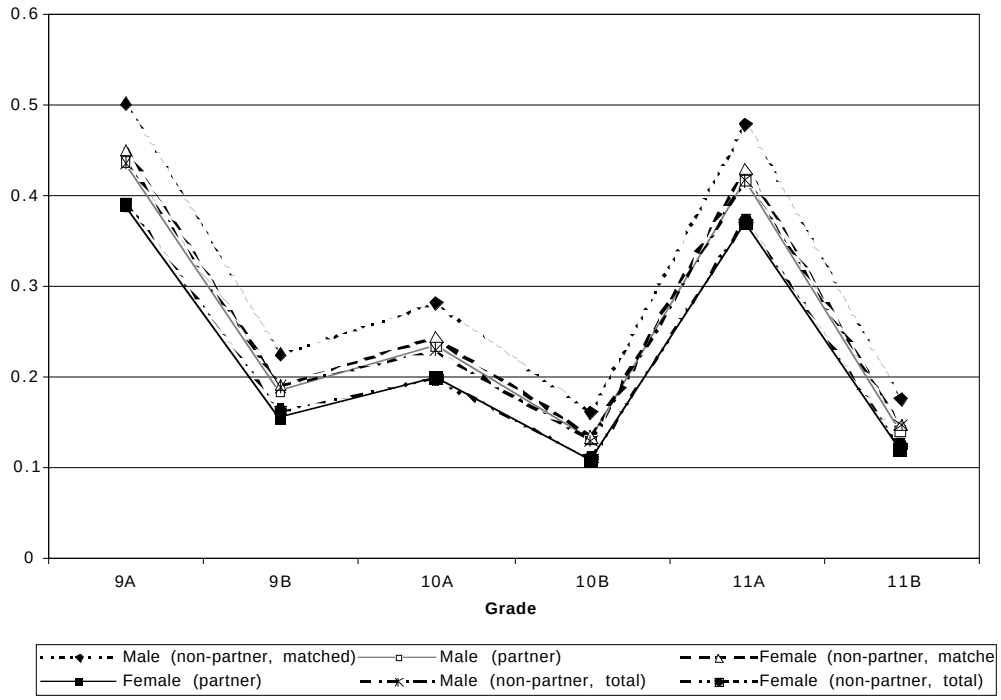

Figure 4-6. Hazard function plot of gender and partnership school status.

The hazard of falling off-track, shown in Figure 4-6, also follows the pattern exhibited in the baseline model. That is, the hazard probability increases greatly in the first semester and from 10B to 11A (from the end of 10th grade to the beginning of the 11th) and also moderately from 9B to 10A (from the end of the 9th grade to the beginning of the 10th). The difference between male and female in terms of the magnitude, however, seems to be a little smaller in the hazard probabilities. Since the hazard function is the complement of the survival function, the order in which the groups are presented on the hazard graph is the reverse of the one on the survival graph. Hence, the female students attending partnership schools and the non-partnership schools (total sample) show the lowest hazard of falling off-track, and thus, the highest rate of being on-track. On

the other hand, the male students attending the matched non-partnership schools display the highest hazard of falling off-track.

Ethnic Groups

The ethnic groups in this study are divided into two groups. One consists of White, Asian, and Filipino students. The other is a combination of students who have been historically underrepresented on UC campuses compared to the ethnic makeup of high schools in the district. These students are Hispanic, African American, American Indian, and Pacific Islanders. A disproportionately low number of these students become eligible to go to a UC school. Hispanic students, for example, make up more than 60% of the student body in the district, but only 8% is eligible for applying to a UC campus.

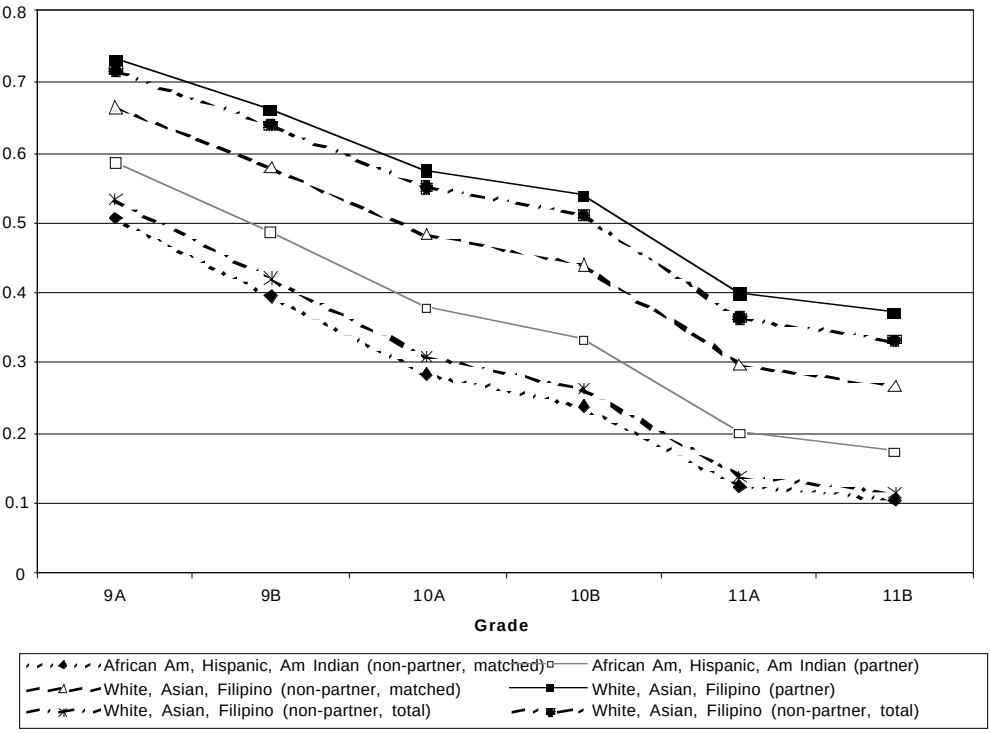

Figure 4-7. Survival function plot of ethnic groups and partnership school status.

Figure 4-7 shows that the survival function plot of ethnic groups displays a pattern similar to the overall pattern (Figure 4-1) and gender, in which the rates of being on-track decrease faster from the end of one grade level to the start of the next than from the fall to the spring semester within the same grade. Unlike

gender, however, the White/Asian/Filipino (well-represented) groups in all three samples (the partnership schools, the total non-partnership, and the matched non-partnership schools) display higher probabilities than the underrepresented minorities. In fact, the gap of about 9% between the well-represented and the underrepresented groups is larger than any other of the differences between the six groups shown in the graph.

Among the well-represented groups, the partnership school students show the highest on-track rates across all semesters, followed closely by the non-partnership school students in the total sample. The students in the matched sample are expected be on-track about 7% lower than the partnership school students. The underrepresented groups show a little different pattern. The partnership school students still display the highest expected on-track rates, but those in the total sample exhibit quite a bit lower probabilities of being on-track than those attending the partnership schools. For instance, the underrepresented students in the total sample show 5% - 6% lower on-track rates than their partnership school counterparts, compared to the 1%-2% difference for the well-represented groups (See Figure 4-7).

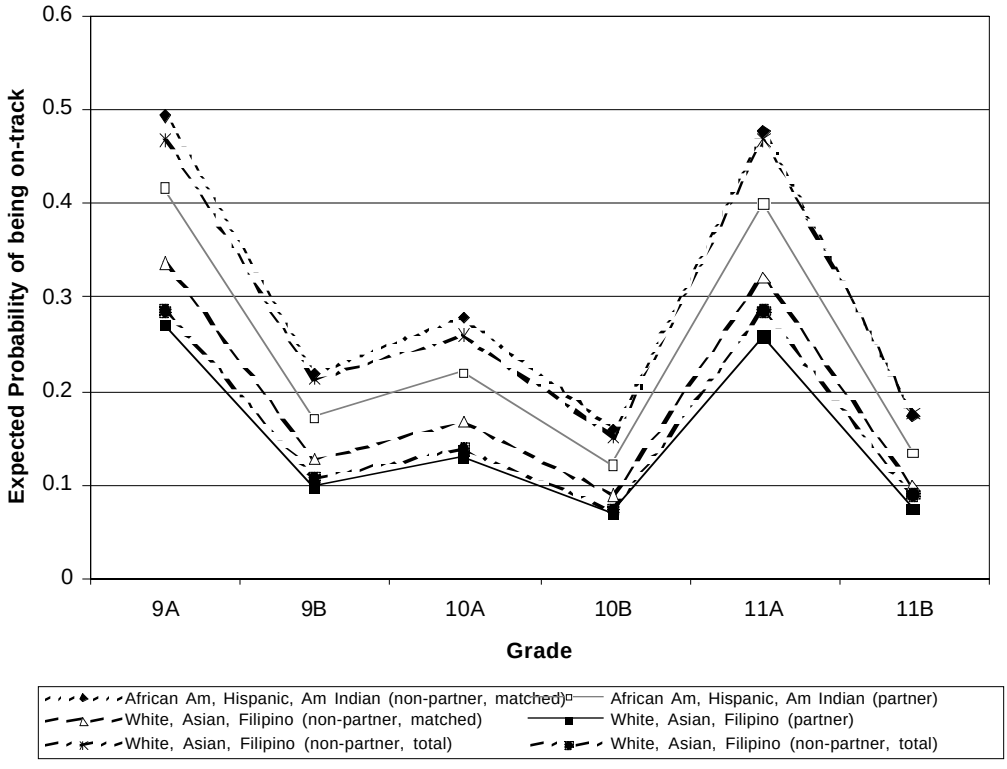

Figure 4-8. Hazard function plot of ethnic groups and partnership school status.

Figure 4-8 exhibits the hazard functions by partnership school status. The group with the highest on-track rate, White / Asian / Filipino group in the partnership school, has the lowest hazard probability. Moreover, for this group, the hazard probabilities do not increase as drastically as they do for the underrepresented group with the highest hazard probabilities, showing more severe changes from semester to semester. In addition, unlike the overall hazard functions (Figure 4-2), the hazard probabilities in the fifth semester are almost as high as those of the first semester for all trajectories, whereas the overall hazard probabilities show the fifth semester lower by 9% than the first. Therefore, a student, regardless of ethnicity, is likely to fall off-track in the first semester as well as the fifth semester.

English Proficiency

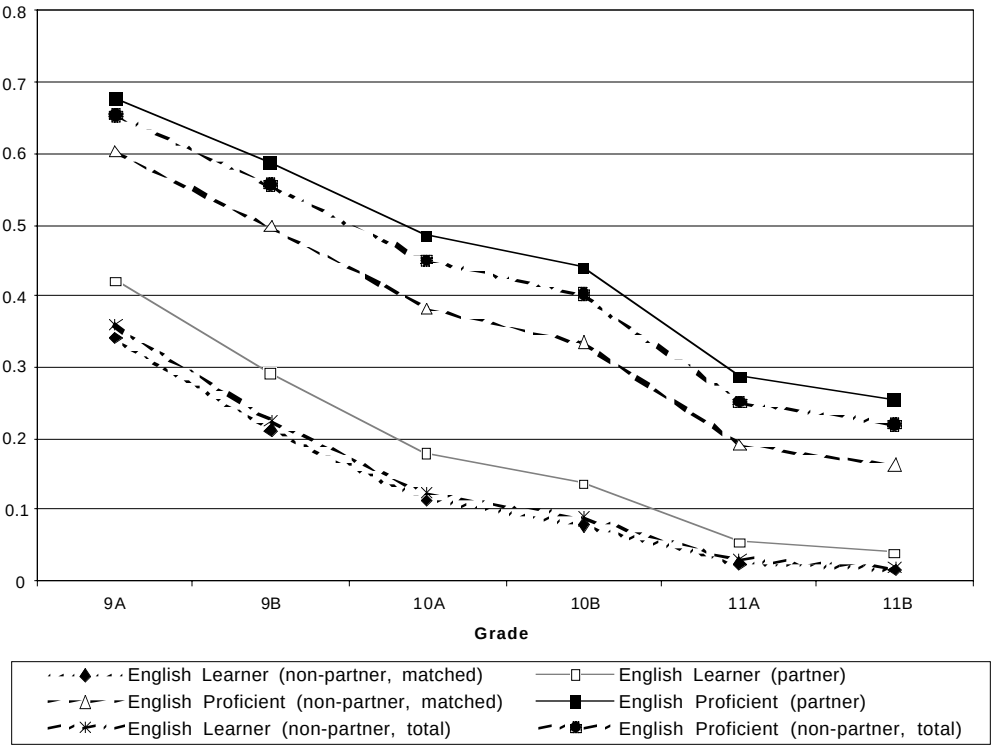

Figure 4-9. Survival function plot of English proficiency and partnership school status.

Figure 4-9 shows the probabilities of being on-track for English learners and proficient English speakers. This student characteristic of English proficiency also seems to be divided along the categories within the variable since a large gap, as much as 20%, exists between the English learners and the fluent speakers.

The partnership school students who are fluent in English show about a 68% probability of being on-track in the first semester, which declines to approximately 25% at the end of the semester. The same groups of students who are not yet proficient in English display much lower probabilities of 42% in the first semester and 4% in the last. Hence, the proficient English speakers are more likely to be on-track than the English learners.

As with ethnicity, the partnership school students show the highest probabilities of being on-track for both categories of English proficiency, followed by the students in the total sample, and then those in the matched sample. Note that although the partnership school students display the highest probabilities of being on-track, English proficient students in the total and matched sample show a larger gap of 5%, compared to about 1.5% for English learners.

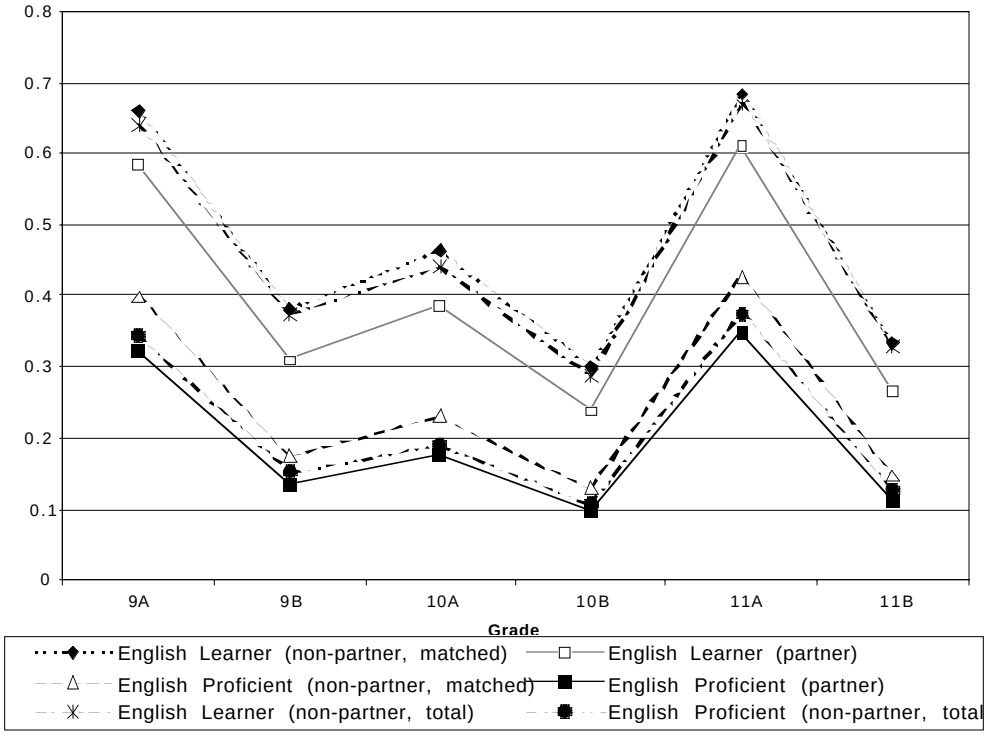

Figure 4-10. Hazard function of English proficiency and partnership school status.

In Figure 4-10, the hazard function plot by English proficiency, the division between the English learners and proficient speakers of English seems more evident since the two groups are closer together. Again, the order of the groups

in the hazard functions is reversed from the survival function graph. The English proficient students attending the partnership schools show the lowest hazard probabilities, while the English learners in the matched sample display the highest probabilities of being off-track. It is significant to note, in addition, that the hazard probability in the fifth semester (between the end of the 10th and the middle of the 11th grade) is higher than the probability in the first semester. Hence, the fifth semester becomes the period with most risk for students of falling off-track for English proficiency.

Attendance

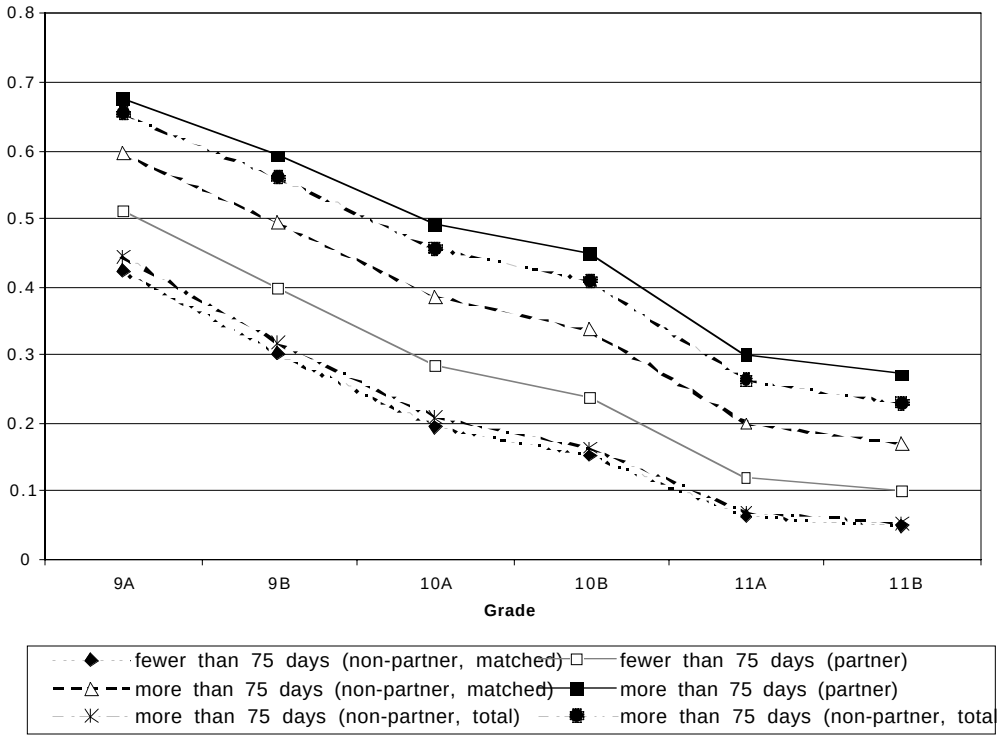

Figure 4-11. Survival function plot of attendance and partnership school status.

The survival and hazard plots of attendance, Figures 4-11 and 4-12, compare two groups of students: those who attended school more than 75 days out of 90 days in the first semester, and those who attended school fewer than 75 days. Note that the trajectories seem to be divided along the categories of the student characteristic, as seen in English proficiency and ethnicity. The partnership school students who attended more than 75 days are most likely to remain on-

track throughout the 3-year period. These students show about a 67% probability of being on-track after the first semester of the 9th grade and 27% at the end of the 11th grade. The same group of students who attended fewer than 75 days shows 51% and 10% in the first and the last semesters, respectively. Again, as with some of the other student characteristics, the students in the total sample display higher probabilities of being on-track than those in the matched sample. The disparity between these two groups is larger in the high attendance (more than 75 days) group than in the low attendance group. This is consistent with the results in the frequency section of the report since the students in the high on-track category (e.g., White / Asian / Filipino group, high attendance group, etc.) in the matched sample display lower on-track rates. Hence, a possible program effect of the School / University Partnership Program seems to be more visible for the students in the high on-track category in the matched sample than the low on-track category.

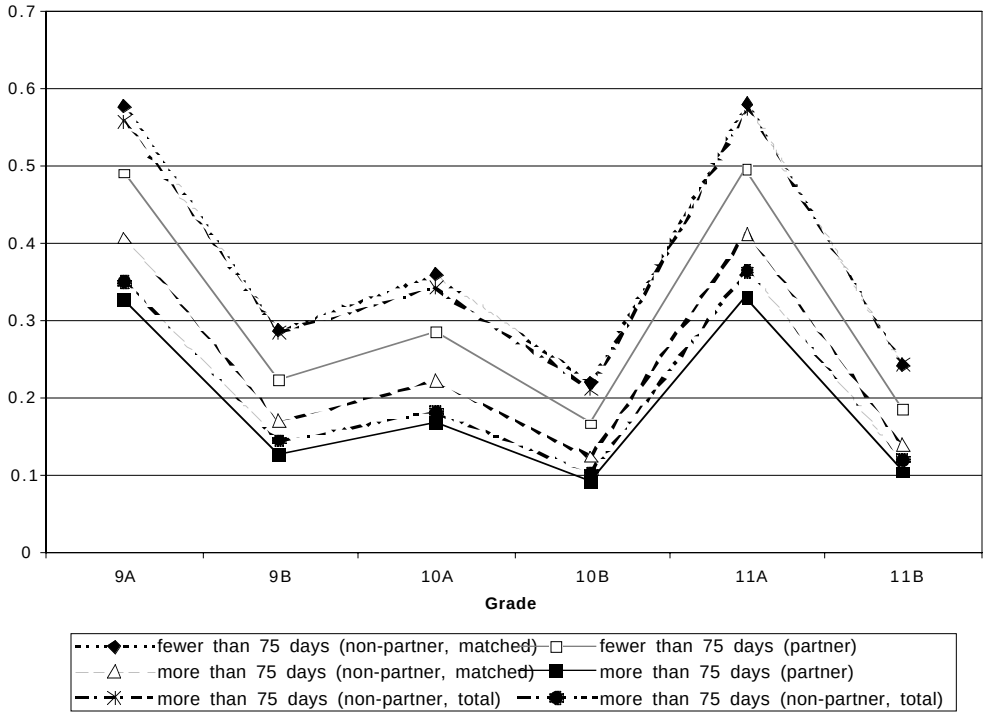

Figure 4-12. Hazard function plot of attendance and partnership school status.

Figure 4-12 displays the hazard probabilities of falling off-track by attendance and by partnership school status. We notice that the students attending the

partnership schools for more than 75 days a semester show the lowest probabilities of falling off-track. However, for all groups, the hazard probabilities during the first semester and the fifth are equally high, meaning the students can fall off-track as easily in the first semester as in the fifth semester. Thus, after students go through the first semester, the period between the end of the 10th grade and the middle of the 11th grade seems to be the most critical one for all who are concerned about being eligible for admission to a UC campus.

Free/reduced Lunch

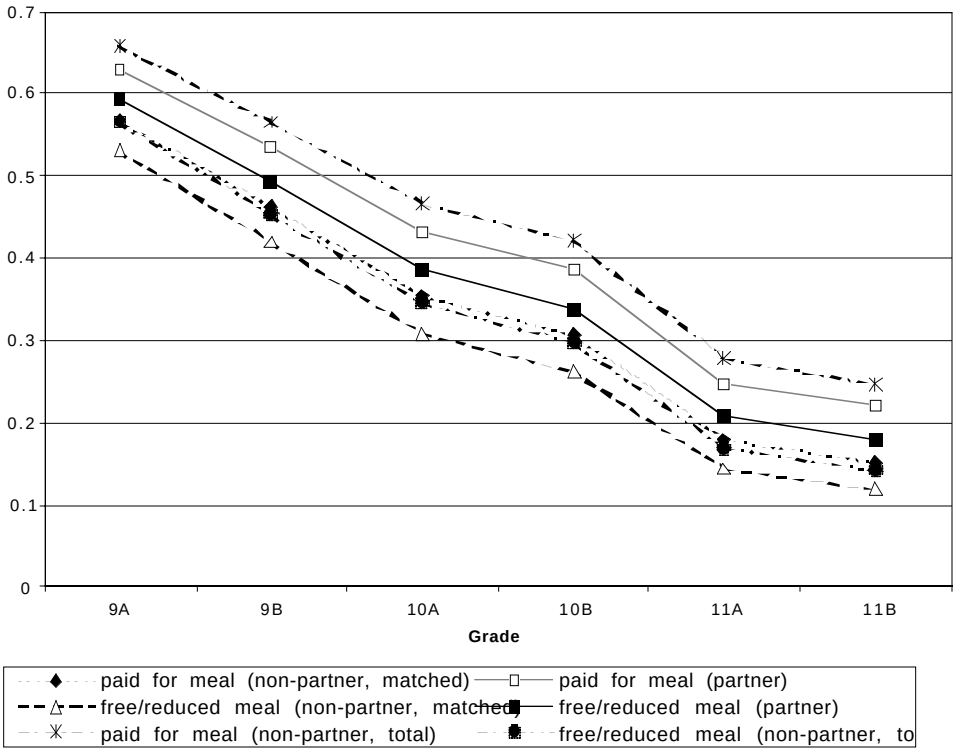

Figure 4-13. Survival function plot of free/reduced meal status and partnership school status.

Figure 4-13 shows the on-track probabilities for students receiving free/reduced meals and those paying in full. The graph displays the paying, non-partnership school students as having the highest probabilities of being on-track at about 66% after the first semester and 25% after the last semester. The partnership school students who pay for their lunch exhibit the second highest probabilities of being on-track, and the same group of students who receive full or partial subsidy for lunch ranks third. The former group of partnership school

students displays about a 63% probability of being on-track at the end of the first semester, and 22% at the end of the last. The group displaying the lowest probabilities is those receiving free/reduced lunch in the matched sample, 12% of which is expected to remain on-track at the end of the 11th grade. Additionally, the pattern for all groups follows that of the baseline model, and also resembles the survival plot for gender. All trajectories are parallel, and the gaps between them are rather close.

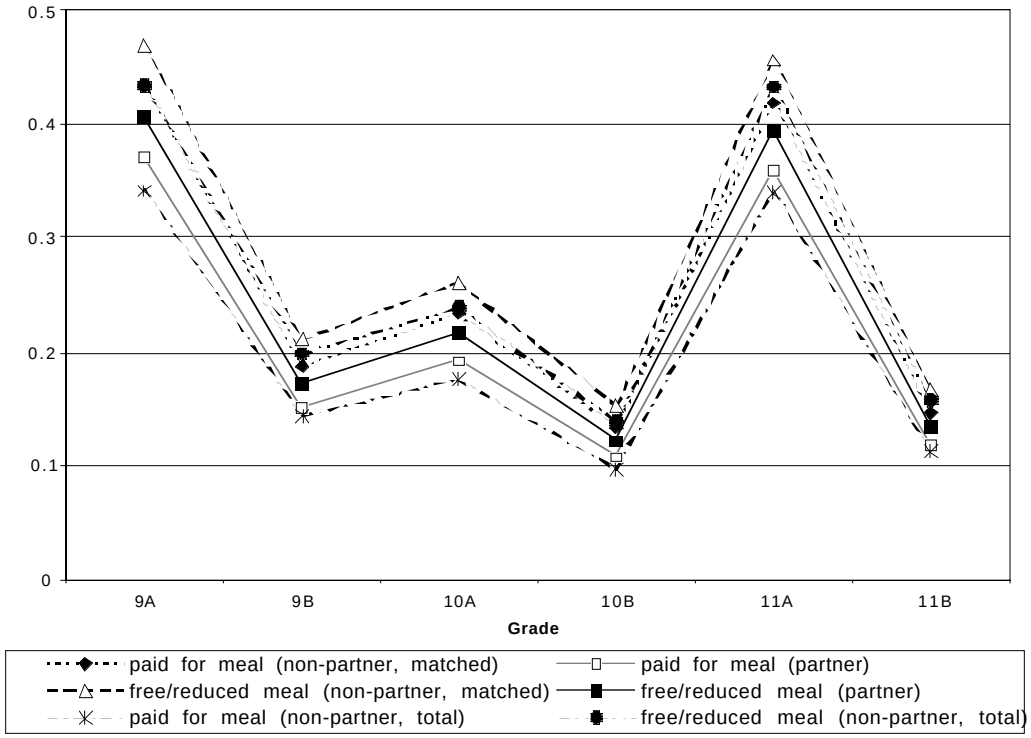

Figure 4-14. Hazard function plot of meal status and partnership school status.

Figure 4-14 shows the hazard functions of being on-track by meal status and by the partnership school status. Again, the paying students in the total sample display the lowest hazard probabilities across all semesters because they show the highest probabilities of being on-track. As with the some previous student characteristics, the hazard probabilities of falling off-track for all groups in the fifth semester (between the end of the 10th grade and middle of the 11th grade) are as high as the ones for the first semester.

Algebra 1 Completed in Grade 8

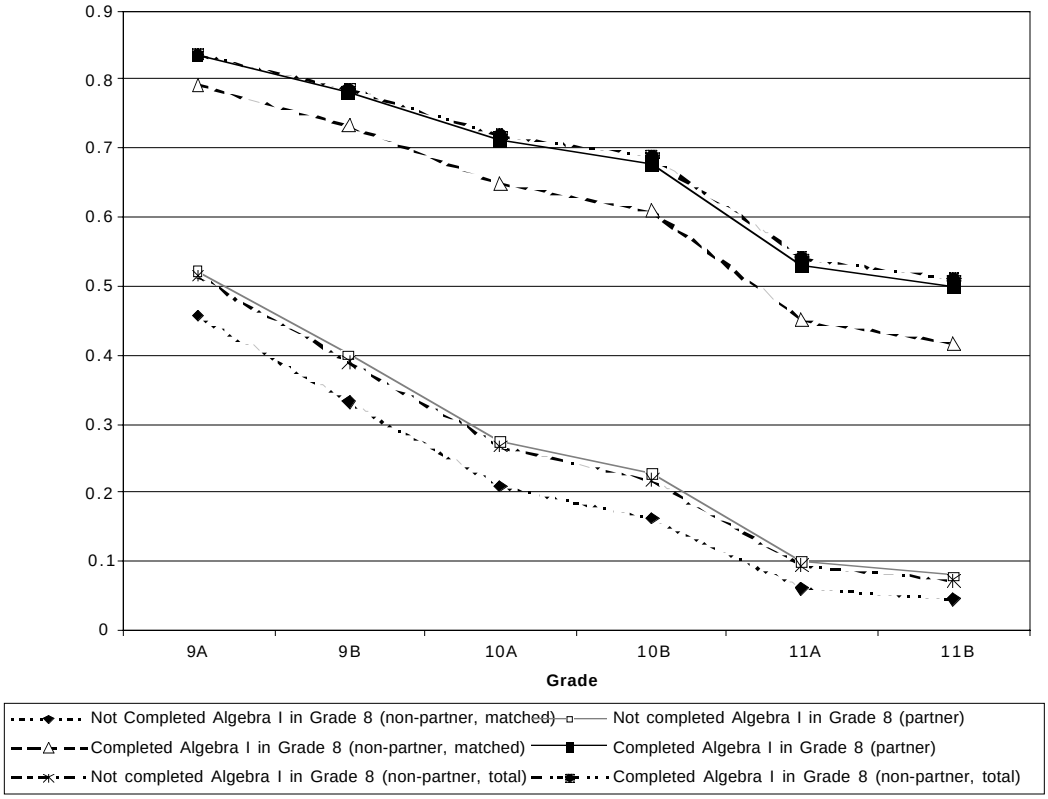

Figure 4-15. Survival function plot of Algebra 1 completion in Grade 8 and partnership school status.

Figure 4-15 shows the survival functions of the students who took Algebra 1 in Grade 8. It is clear that those who completed the math course are expected to remain on-track much more than those who did not take or complete the course. The trajectories resemble those in the frequency graphs of the same variable in that there is a large gap of more than 30%, on average, between the students who completed algebra in Grade 8 and those who did not. The students attending the partnership schools and who completed the course in the 8th grade display about an 83% probability of being on-track after the first semester and approximately 50% at the end of the 11th grade. Those who completed the course in Grade 8 in the total sample display about the same rate as the partnership school students. Additionally, the trajectories of those who did not complete Algebra 1 a year early resemble those of the students who did complete the course, except at much lower probabilities. Hence, the students in the matched group for both categories of the variable exhibit an average of about 5% lower probabilities than those in

the total sample or the partnership school students. Further, the students in the matched sample who completed Algebra 1 a year early show a larger gap (8%) than those who did not complete the course. This again is consistent with the results of other student characteristics in which the category with the higher on-track rates seems to separate out the students in the matched sample.

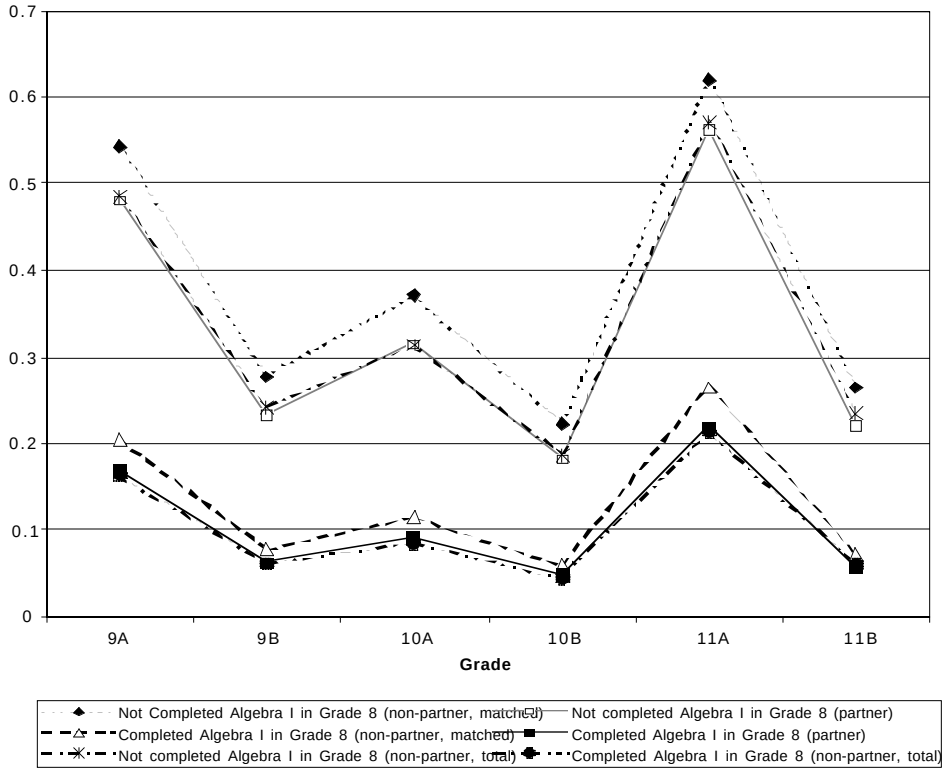

Figure 4-16. Hazard function plot of Algebra 1 completion in Grade 8 and partnership school status.

Figure 4-16 displays the hazard probabilities of being on-track by the completion of algebra in Grade 8 and by partnership school status. We see two very distinct groups of trajectories as seen in the survival function graph (Figure 4-15). The flatter trajectories show the students who completed Algebra 1 in Grade 8, and the steeper ones show those who did not take the course a year early. As with the survival plot, the partnership school students and those in the total sample exhibit nearly the same hazard probabilities (or remaining on-track for the survival graph). Further, the students in the matched sample show higher probabilities of falling off-track for both categories of the variable. Finally, it is significant to note that, for all groups, the hazard probabilities in the fifth

semester are quite higher than the first semester probabilities by about 5%. Therefore, the risk of falling off-track during the fifth semester is highest for this variable.

Algebra 1 Grades

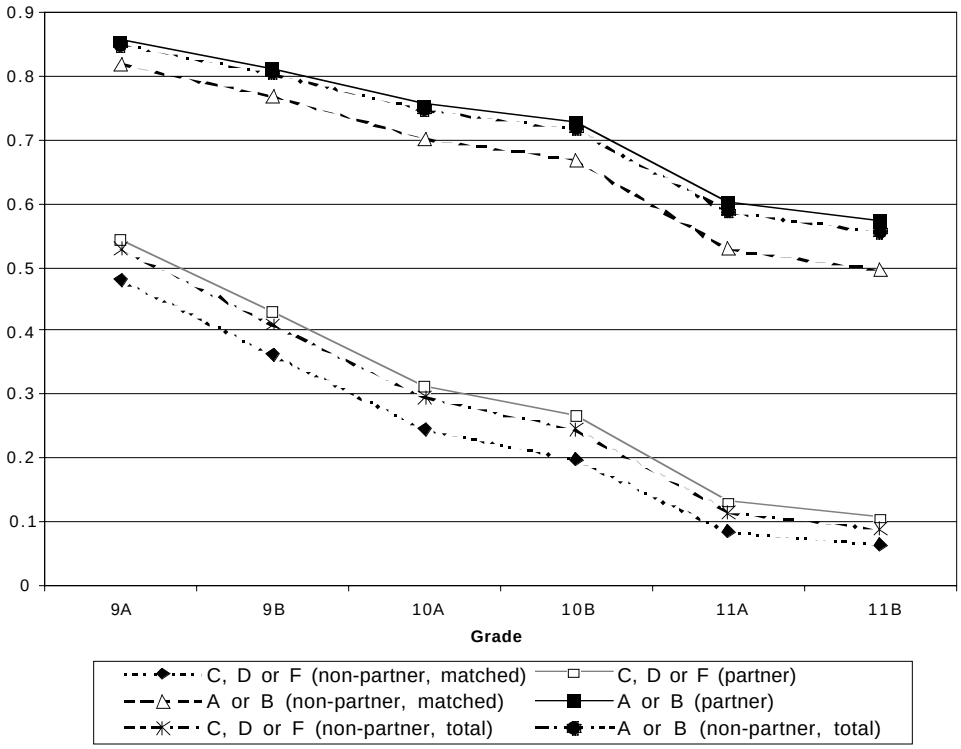

Figure 4-17. Survival function of Algebra 1 grades and partnership school status.

The survival function of Algebra 1 grades, Figure 4-17, shows that the students who received an A or B in Algebra 1 have much higher expected probabilities of being on-track than those who received a C or below. We see two groups of trajectories clustered along the high and low grades of the course. The students who received a grade of A or B expectedly show much higher probabilities of being on-track for all six semesters. The disparity is about 30% in the first semester and increases to over 40% at the end of the last semester. As we have seen in ethnicity, attendance rates, and English proficiency, this variable shows the partnership schools on the top of each category. The partnership school students who received a grade of A or B are expected to be on-track at over 85% by the end of the first semester and 57% by the end of the last semester. The

same group of students, but with a grade of C or below, displays the highest probabilities in the low-grade category. Approximately 54% of these students is expected to remain on-track in the fall semester of the 9th grade, and a little more than 10% of them is expected to be on-track at the end of the 11th grade. Further, while the students in the total sample have nearly the same probabilities as the partnership school students, those in the matched sample exhibit lower expected probabilities. For the high-grade groups that received an A or B, the students attending the matched non-partnership schools show a 3% to 7% gap with those attending the partnership schools. For the low-grade groups, the gap ranges from 4% to 6%.

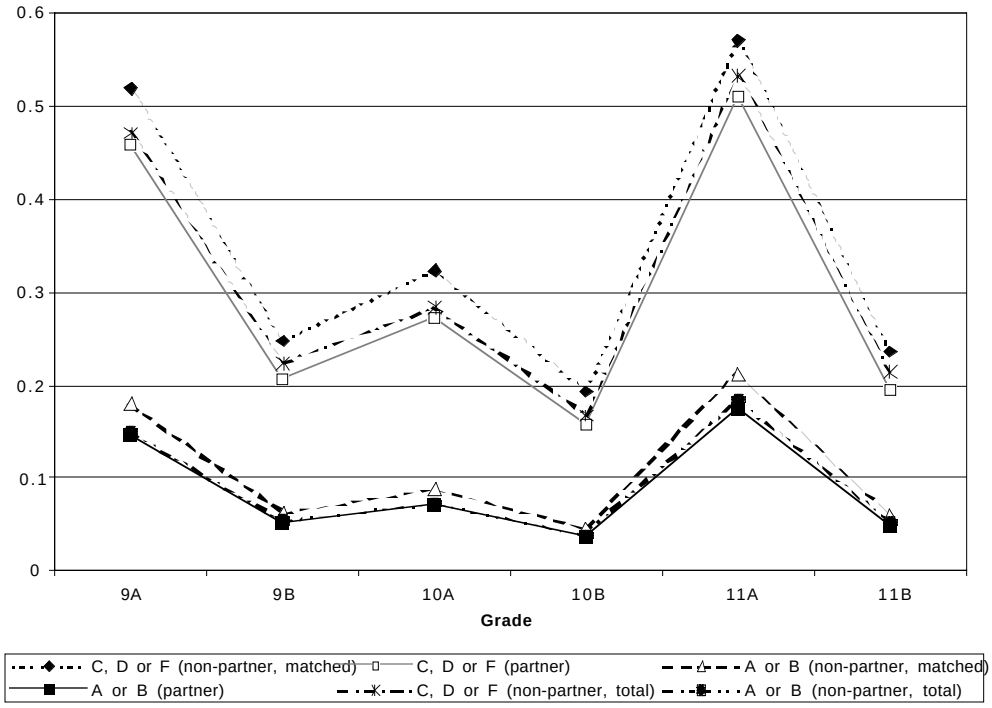

Figure 4-18. Hazard function plot of Algebra 1 grades and partnership school status.

Figure 4-18 shows the expected probabilities of risk for the two categories of students corresponding to their survival probabilities. The students who received an A or B in Algebra 1 at the partnership schools show the lowest hazard probabilities. The low-grade groups show the expected hazard probabilities as low as 0.2 and as high as 0.55, whereas the high-grade groups exhibit the probabilities between 0.05 and 0.2. Further, all groups show that the

hazard probability during the fifth semester is a little higher than that of the first semester, reminiscent of Algebra 1 completion in Grade 8.

Geometry – Passing Grades

Geometry is the next math course after Algebra 1 in most high school math sequences. A student must receive a D or better in Algebra 1 to enroll in geometry. However, the UC requirements do not usually recognize a grade below C in order for a student to be eligible for admission to a UC school. Hence, this student performance characteristic divides students based on the passing grade of C. Thus, the high-grade groups for this variable become those with a grade of A, B, or C, and the low-grade groups are those with a grade of D or F. To be consistent with the UC requirements, in this report we define passing as having received a grade of A, B, or C.

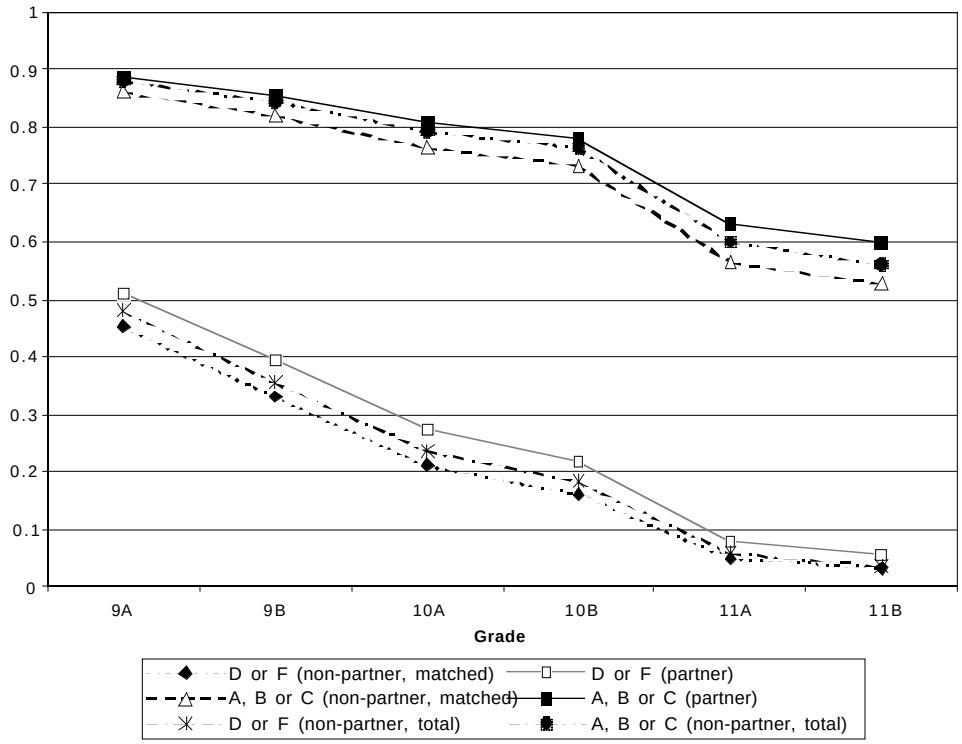

Figure 4-19. Survival function of geometry grades and partnership school status.

The trajectories in Figure 4-19 look very similar to the ones for algebra grades presented earlier. The students who passed the course with a C or better, and those who did not, show a large disparity between them. The difference is

over 50% at the end of the 11th grade. The former display expected probabilities of being on-track at close to 90% at the end of the first semester and an average of a 55% on-track rate at the end of the last semester. However, the latter shows the expected probabilities as a little lower than 50% in the beginning of high school, and less than 5% of these students are expected to remain on-track at the end of the 11th grade. As with Algebra 1 grades, the partnership school students have the highest expected probabilities of being on-track for each category. Unlike Algebra 1 grades, however, the students in the matched sample in geometry grades show expected probabilities quite close to those in the total sample or in the partnership schools. The three groups for both categories, in fact, have trajectories very close to one another.

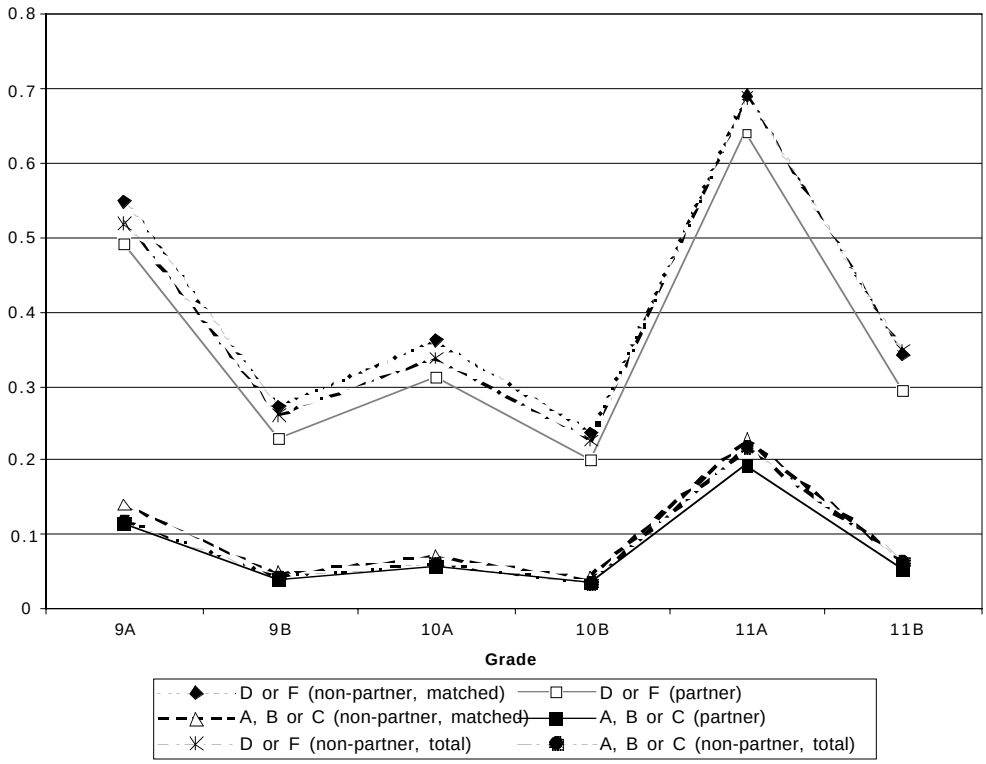

Figure 4-20. Hazard function of geometry grades and partnership school status.

Figure 4-20 shows the hazard probabilities of geometry grades by the partnership school status. As seen in the survival function graph (Figure 4-19), the high-grade groups of A, B, or C exhibit lower expected probabilities than the low-grade groups. The disparity between the two groups is large at almost 40% at

the end of the first semester, and about 25% at the end of the last semester. Further, the low-grade group shows steep slopes, especially in the first and fifth semester, which is the general pattern for all hazard function graphs although at different magnitudes. However, the high-grade groups show much flatter slopes even during the fifth semester. The hazard probability at the end of the fifth semester for all groups is the highest, meaning during this period students are most likely to fall off-track. Moreover, compared to other student characteristics, the geometry grades display particularly high hazard probabilities during the fifth semester in comparison to the first. They are almost 20% higher than the expected hazard probabilities in the first semester, compared to 10% for the algebra grades. Therefore, the students who do not get at least a C in geometry are especially likely to fall off-track during the fifth semester, which is between the end of the 10th grade and the middle of the 11th.

English 9 Grades

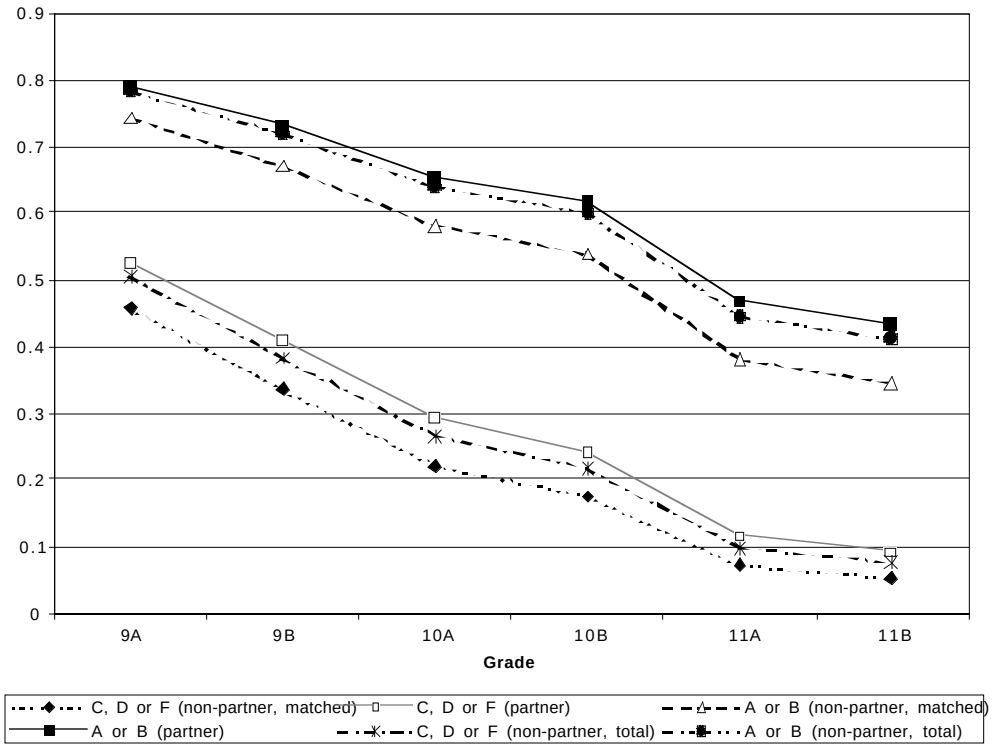

Figure 4-21. Survival function plot of English 9 grades and partnership school status.

Figure 19 shows the survival functions of English 9 grades and partnership school status. As with the algebra and geometry grades, two categories of high and low grades are clearly separated and clustered among the same category groups. The students who finished the first three years at the partnership schools display the highest on-track probabilities for each category, although the rates are very close to those of the students in the total sample. The students in the matched sample seem to show a little lower expected probabilities. Further, the gap between the high- and low-grade groups is not as severe as seen in algebra grades, but it is quite large at almost 30% at the end of the first semester and more than 30% at the end of the last semester. The students, who received an A or B, for example, display an expected probability of close to 0.8 in the middle of the 9th grade and about 0.4 at the end of the 11th grade. Also, the students attending partnership schools and who received a higher grade show an expected probability of 0.433 at the end of the 11th grade, whereas the same group of students but who received a C or lower have only a 9% probability of remaining on-track during the same period. Finally, the students in the matched group show the lowest probabilities of staying on-track in the their respective category, which is consistent with algebra and geometry grades.

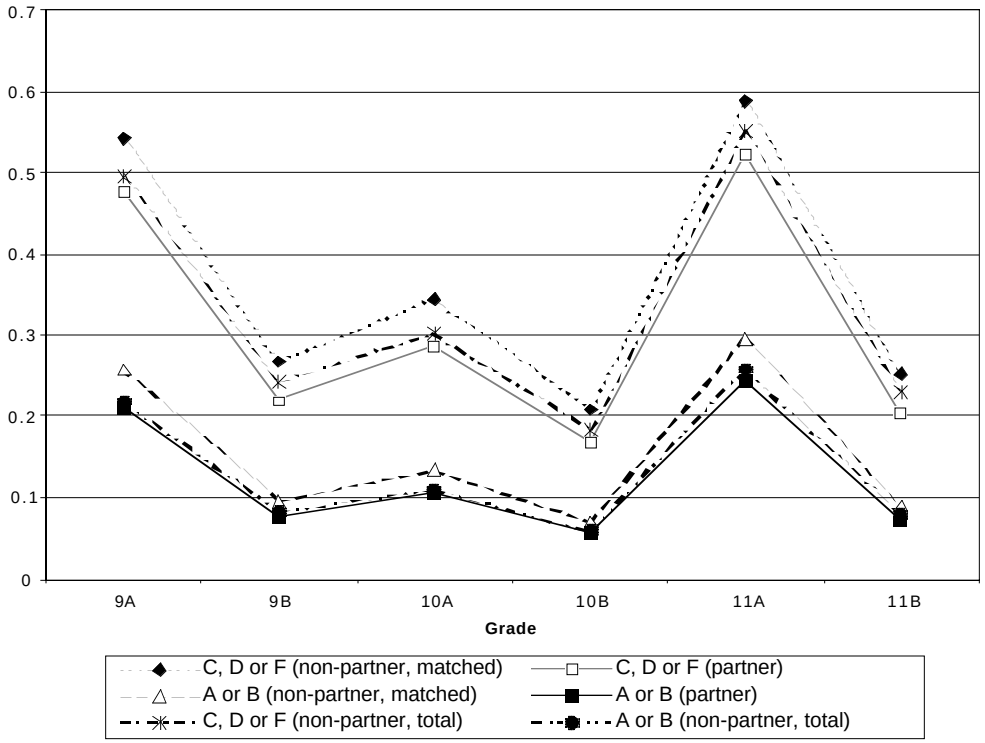

Figure 4-22. Hazard function plot of English 9 grades and partnership school status.

Figure 4-22 displays the hazard probabilities of English 9 grades by partnership school status. The students with high grades attending the partnership schools expectedly show the lowest hazard of falling off-track, and those with low grades in the matched sample exhibit the highest risk of falling off-track. As seen in algebra grades, the high-grade groups show flatter slopes in their trajectories, and the low-grade groups show much steeper slopes. Moreover, the hazard probabilities during the fifth semester are the highest of all semesters, making it the period with the highest risk of falling off-track.

In summary, we can predict how likely a group of students would be able to stay on-track by looking at the survival probabilities, and see how much risk they would be facing depending on various student characteristics by examining the hazard probabilities. We have found that most students have a decreasing probability of staying on-track as they progress from the 9^{th} to 11^{th} grade. The fifth semester, a period between the end of the 10^{th} grade and the middle of the 11^{th}, shows a sharp decline in the survival probabilities in most cases. Further, the hazard probabilities complement the results from the survival graphs. For example, the first and fifth semester display the highest hazard probabilities, meaning the students are most likely to fall off-track during these periods.

The order in which different groups rank in their expected probabilities of being on-track consistently shows that the students attending partnership schools are more likely to remain on-track than the non-partnership school students, for both categories (e.g., male and female) of a student characteristic. The gaps between different groups vary, however. For most variables illustrating a student characteristic, we see little difference between the partnership schools and the total group of the non-partnership schools. However, we often see the matched non-partnership schools displaying lower survival and hazard probabilities than the other two groups, creating a larger gap from the partnership schools than the disparity between the total non-partnership schools and the partnership school. This finding is consistent with the frequency graphs in the results section, in which we present the matched non-partnership schools as producing generally fewer students who are on-track than the total non-partnership schools. Therefore, we believe that the partnership schools are making a difference in increasing the number of students who are on-track, or eligible, for UC admission.

Summary of Key Findings

We started with research questions probing the probabilities of high school students remaining on-track until the end of high school and being eligible to apply for a University of California campus. At the same time, we were looking for patterns in terms of their background characteristics and academic performance to help us determine whether such characteristics have any effect on the outcome—that is, being either on- or off-track for UC schools.

The following specific questions are asked to address the general question stated above:

- What proportion of students is completing the benchmark courses at the end of each semester?
- Who are those students by demographics and other student characteristics? Is there a pattern consistent across selected variables?
- What is the risk involved in each semester of not completing or not taking a benchmark course by various student characteristics?
- How likely is it for a certain type of student (e.g., an African American male student receiving free/reduced meals) to finish all six benchmark courses? What are other key student profiles, and what are the chances of each student profile completing all six benchmarks?

We have described the results in detail in the Results section, and we summarize our key findings here:

1. After the first semester, about half of all students stay on-track, and only about 11% of all students in the cohort remain on-track at the end of their 11th grade year.
2. Looking at the partnership and non-partnership school separately, we have found that 9.5% of the former and 11.8% of the latter remained on-track at the end of the last semester. However, if the students who dropped out of school are excluded, and only those who finished at the same school are compared, the on-track rate becomes about the same—17.5% for the partnership schools and 17.7% for the non-partnership schools.
3. To make a more accurate comparison, we have sub-sampled the non-partnership schools (i.e., the matched sample) that have similar family

income levels and ethnic makeup (See Table 2.2). Comparing the partnership schools with the matched non-partnership schools, we have discovered that the on-track rate of the former (9.59%) is now higher than the latter (7.67%) by about 2%.

4. Moreover, if we exclude the dropouts from both groups, the rates of being on-track become 17.46% for the partnership schools and 12.38% for the non-partnership schools, a 5% gap in favor of the partnership schools. This is a remarkable finding considering the picture of the first comparison in which all students from the partnership schools and all from the non-partnership schools are compared.

5. However, as much attention needs to be given to those students who dropped out of school as those remaining in school and doing well. There are three possible groups of students who did not finish at the school they started at. One group is those who dropped out of school altogether and are not attending any other school. 5,644 of 14,390 students from the partnership schools and 11,535 of 34,199 from the non-partnership schools dropped out and did not return to school during the three years for this study. These numbers represent more than a third of all students for each group. The second group is those who transferred from a partnership school to a non-partnership school, or vice versa. We found that 1,140 students moved from a partnership to a non-partnership school, 41 of which were on-track at the end of the 11th grade. The third possible group would be the students who moved to another district, but we do not have the data for these students and therefore included them in the dropout group.

6. There is a pattern common to many of the graphs describing various student characteristics. That is, the largest block of students fall off-track in the fall of their 9th grade year, followed by a steep decline until the middle of the 10th grade, a slow decrease until the end of the 10th grade, again followed by a rather sharp decline, and finally stabilizing towards the end of the 11th grade. This pattern can also be a little more generalized and described as one in which most students fall off-track in the 9th grade and between grades (e.g., from Grade 9 to 10, and Grade 10 to 11). Fewer students fall off-track within the same year (e.g., from fall to spring semester of 10th grade).

7. The students, who started the program at the beginning of the ninth grade, but since dropped out of the program, remained on-track less than 1% of the original group. Sixty-three percent of the students in this group fell off-track in the first semester, and 15% in the second. Considering this group makes up approximately half of the project students at the beginning of the ninth grade, we think it is crucial to plan

and implement an intervention program to minimize the number of dropouts.

8. Examining the on-track status across time of traditionally underrepresented ethnic groups is the primary focus of this study and of the UCOP, which funded the study. These underrepresented minorities include African Americans, Hispanics, Pacific Islanders, and American Indians. The students attending the partnership schools are comprised mostly of African American (23%) and Hispanic students (75%), and the program effect seems to be significant when one considers the fact that the partner schools are located in low income neighborhoods with many disadvantages compared to some of the non-partnership schools located in middle-class suburban areas.

9. In addition to ethnicity, days of attendance, and English proficiency, Algebra 1 and English 9 course grades seem to predict student outcome well. Those students who received an A or B remained on-track at a much higher proportion than the students with a lower grade. For example, there is a 40% difference of being on-track between those who received a higher grade in Algebra 1 and those who received a lower one. Moreover, the students who completed Algebra 1 in Grade 8 also remained on-track at a 40% higher rate than those who did not.

10. It is confirmed from the hazard functions of all variables used in the analysis that the time intervals between grade levels, compared to within grades (i.e., from fall to spring semester) carry more risk. Hence, from the end of Grade 9 to the middle of 10, and from Grade 10 to 11, the hazard probabilities go up, meaning there are greater chances of students falling off-track during those periods.

11. In all survival function plots, the group with the highest probability of remaining on-track in most cases is the partner school students who finished all benchmark courses in the appropriate time, hence on-track for the whole duration of six semesters. Of these students, the following groups display a higher proportion of being on-track: female students, the White/Asian/Filipino group, English proficient students, students attending more than 75 days, students receiving free meals, and students with an A or B in selected benchmark courses.

12. A few variables were able to predict a high probability of remaining on-track, holding other variables constant. The Algebra 1 course grade, for example, is associated with the highest probability of staying on-track for the students who attended and finished the 11^{th} grade. That is, a student attending a partner school who received an A or B in Algebra 1 has a 0.57 probability of being on-track at the end of the 11^{th} grade. This is a very

high probability compared to 0.17, the overall probability of partner school students. Other predictors that reveal a similarly high probability for this group are Algebra 1 taken in Grade 8, an English 9 course grade, magnet school participation status, and ethnic group status. All of these variables exhibit a 40% to 50% probability of remaining on-track for the students attending a partner school through the end of the 11th grade.

13. In most survival function and hazard function graphs, the shape of each group is about the same, running roughly parallel to each other. This indicates that the effect of a predictor is the same over time, only changing vertically for different values of the predictor. For example, the effect of being female stays constant over the three-year period in high school. However, some predictors have a different shape in the survival function and/or hazard function plots. It is significant to note that the categories coded 1 in some variables (i.e., the group associated with a higher on-track proportion: English proficient, a higher grade in Algebra 1, and of the White/Asian/Filipino group) have a different shape in the graphs. The different or non-parallel trajectories can indicate differential effects of a variable at different time points.

14. We examined the probabilities of key student profiles (combinations of the background characteristics and other predictors that comprise a profile of a student) from the matched sample. One example of a profile may be a male student who belongs to the underrepresented ethnic group, who is fluent in English, and who received a C in Algebra 1 and a D in geometry. Thus any student who has the above profile and attends a partnership school would have a 0.23 probability of remaining on-track at the end of Grade 11. Our results reveal that the number of attendance days significantly affects students' probability of staying on-track at the end of the 11th grade, for both males and females, holding the ethnic status and English proficiency constant. For example, a female student at a partner school, who is an underrepresented minority and proficient in English, would have a 34% chance of remaining on-track at the end of the 11th grade if she attended school more than 75 days, compared to a 18% chance if the days of attendance are fewer than 75 days. The above is true for males as well, although the probabilities are a little lower. Moreover, a student with limited proficiency in English with the same profile is likely to remain on-track by only 10% at the end of Grade 11, compared to the 34% of the English proficient group.

15. The Algebra 1 course grade has also shown to be a deciding factor in increasing a student's probability of staying on-track. A course grade of A or B in algebra, in comparison to a grade of C or below, is likely to increase the on-track probability by 46% at the end of the 11th grade (from 19% to 65%) for a female, underrepresented minority student attending a partner school more than 75 days. For a student attending a non-partner

school, but otherwise in the same situation, the probability increases by 36% (from 10% to 46%) if she received an A or B, rather than a C or below. Even the profile with the lowest probability of staying on-track—namely, underrepresented males attending a partner school fewer than 75 days—the chances go up from 5% in the middle of the 9th grade to 29% at the end of the 11th grade, a total increase of 24%.

16. As will be addressed in the discussion, algebra seems to be crucial for students coming from an underrepresented ethnic background. In addition to the Algebra 1 course grade discussed above, the probability of remaining on-track at the end of the 11th grade of a student attending a partnership school is 31% for completing Algebra 1. Taking and completing Algebra 1 a year early (in the eighth grade) increases the probability to 44%. Completing Algebra 1 with a course grade of A or B further increases the probability to 53%. Therefore, encouraging students to enroll in and complete Algebra 1 with a high grade will tremendously increase their probability of being on-track.

Discussion and Conclusion

This report examined the current status of UC eligibility as it relates to ethnicity by looking at course-taking patterns of ninth-grade students over a period of three years. We asked the following questions based on the completion status of the courses required by the University of California for admission eligibility (i.e. A – G requirements).

- What proportion of students completes the UC required courses at the end of each semester? How does the picture change for different breakdowns of students according to the status of partnership school attendance, dropout status, and non-partnership school students similar to their partnership counterpart in SES and ethnicity?

- Who are those students by demographics and other student characteristics? Are there consistent patterns across student characteristics and academic subjects?

- How likely is it for a certain type of student (e.g., underrepresented male student with fluent English proficiency and receiving free/reduced lunch) to finish all required courses? What are other key student profiles, and the probability of each student profile for completing all courses?

- What are the predicted probabilities of being on-track and of falling off-track for various student characteristics? What are some of the patterns across different variables?

Building on the findings by Quigley and Leon (2002), we have shown that certain variables such as high attendance rates and high math grades are associated with higher probabilities of remaining on-track than other predictors. We have also attempted to pinpoint when students are most likely to fall off-track and to identify the combination of student characteristics that are associated with the highest probability of falling off-track, so that an intervention program can be planned and implemented.

Looking at the proportion of high school students eligible for UC admission over the period of three years, we have found that more students become ineligible between the end of their 10^{th} and the middle of their 11^{th} grade year than at any other time interval. Further, a high course grade (A or B) in Algebra 1 or English 9 substantially increases the probability of remaining eligible for UC admission. The results also show that there is a significant advantage in staying at a partnership school, while moving to a non-partnership school or dropping out of school altogether can be devastating in that it greatly decreases the probability of remaining on-track for UC admission. Finally, we can focus on a profile of students who need the most assistance in being UC eligible based on their expected probability of staying on-track.

These results have several policy implications. First, to make more students to stay on-track, the school administrator must examine the time intervals during which a large proportion of students fall off-track because they do not take or complete the appropriate benchmark courses. The administrator may find that it is difficult for some students to return to rigorous studying after three months of summer vacation. Or, some may have dropped out of school altogether. Finding the reasons that some students stop taking the required courses appropriate for a particular semester would be critical in developing an intervention program to help them get back on-track.

Second, in addition to encouraging students to obtain a high grade, the administrator needs to examine whether they are getting the assistance they need to perform well in the required courses. Such assistance would be especially vital for "at-risk" students whose profiles have a low probability of staying on-track. For example, an African American male student with a low attendance record or

a Hispanic male student who is an English learner would be classified as an at-risk student. At-risk students may have the motivation to apply to a UC campus, but may not have the necessary study skills or academic assistance to get an A or B in class. Arrangements can be made to assist students by offering in-class peer tutoring, after-school tutoring by another student who previously took the same class, in-class tutoring by a college student, or by simply making relevant and appropriate resources such as references and computer software available in the classroom or via the Internet.

Third, it is apparent from the frequency and survival function plots that students who completed Algebra 1 in the eighth grade also display a very high probability (40%) of remaining on-track. Hence, school administrators need to evaluate the middle school math curriculum so that more Algebra classes could be offered at middle school and that more students would be able to take them. Such an effort could contribute to a substantial increase in the number of on-track students in high school. Moreover, changes in the middle school curriculum could positively affect elementary school curriculum as well. Encouraging and challenging elementary school students to a more rigorous math program could give them more confidence in math and better prepare them for higher math classes in middle school. Therefore, by enhancing the current curriculum to meet the needs of students who have the desire and potential to handle a higher level of math, the school administrators at the K-8 level can contribute to an increase in UC eligibility.

Fourth, there may be issues with the degree of opportunity available to students to take Algebra 1. Since the students who completed Algebra 1 in the ninth grade have a higher probability of staying on-track than those who did not, having as many students as possible completing Algebra 1 in the ninth grade would increase the number of students eligible for UC admission. However, many more ninth graders took English 9 than Algebra 1. A traditional approach of enrolling ninth-grade students based on their middle school performance may be attributed to the smaller proportion of students taking Algebra 1. For instance, if a student took a pre-algebra course in the eighth grade in middle school, he or she may be enrolled in an Algebra 1 class automatically. However, if a student took regular eighth-grade math (a lower-level math course), he or she would be enrolled in a regular ninth-grade math. Such an enrollment procedure may be justified in terms of the student's performance history in math, but it closes the

options through which the student increases the chances of going to a college such as a UC school. An alternative might be opening up the ninth-grade Algebra 1 class to everyone willing to do the work, but with the necessary assistance to complete the course.

Finally, we know that the students attending a partnership school have a higher overall probability of remaining on-track across different student characteristics. However, examining subgroups that seem to fall off-track at high proportions regardless of the partnership school status may be worthwhile from an intervention perspective. For example, more males, English learners, and students who are absent at least one day a week tend to fall off-track regardless of the partnership school status. Furthermore, different student profiles, or combinations of different student characteristics, can also be investigated to identify at-risk students who possess a profile with a low probability of being on-track. An African American male student, for instance, who missed school 15 days or more in the first semester is a cause for concern because he has only a 9% chance of remaining on-track by the end of the 11th grade. Hence, an intervention program across the district, regardless of the partnership school status, targeting this group of students can be more effective than a program for all African American students, for example.

Further research can be conducted to more extensively examine the students who do not take the benchmark courses in the given semesters but still remain on-track. Although the expected probabilities of being on-track for these students are displayed in their various profiles, a further probe into the different paths of staying on-track during their high school years would provide us additional information such as: "Are there any other potential course-taking paths leading to reasonably high probabilities of remaining on-track?" The results from such analyses can then be used to look into a few viable paths to remaining on-track out of many different possible paths.

Additional research can be done using other cohorts to see how stable the partnership school effect is. A partnership school as a whole may function more effectively in each subsequent year. Such a "multi-wave" study could validate and strengthen the results of this study. Moreover, a school-level analysis can be done to probe whether the expected probabilities of being on-track vary among the partnership schools and the non-partnership schools. Examining different schools, we can address such questions as: "What are the characteristics of a

school that produces a high proportion of on-track students?" The characteristics we derive from such successful schools can then be used to evaluate and improve other schools comparable in relevant characteristics.

In conclusion, the district and the school administrators can improve the rate of students eligible to apply to UC schools by examining the different patterns of students staying on-track and by planning intervention programs based on the patterns and other results of this report. The partnership school program seems to be effective in guiding more students to become UC-eligible, and hence providing more opportunity of attending a UC school. The partnership schools, however, can also improve the rate of on-track students by paying attention to the periods during which most students seem to dropout of the program, by offering students more opportunity to take Algebra 1 with sufficient assistance so that they may complete the course, and by focusing on specific subgroups who seem to have a low probability of staying on-track. Therefore, the road to UC eligibility for a student, whose ethnicity is historically underrepresented at UC campuses, does not have to be long and winding, or even blocked, if educational policy makers and school administrators consider the above implications when making policy decisions.

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Appendix A

A-G requirements – 15 courses required of UC-bound students, in addition to high school graduation requirements, to be completed in order for them to be eligible for applying to a UC campus. The following delineates the specific areas:

"A" History/Social Science – 2 years required
Two years of history/social science including one year of U.S. history or one-half year of U.S. history and one-half year of civics or American government; and one year of world history, cultures, and geography.

"B" English – 4 years required
Four years of college preparatory English that include frequent and regular writing, and reading of classic and modern literature. Not more than two semesters of ninth-grade English can be used to meet this requirement.

"C" Mathematics – 3 years required, 4 recommended
Three years of college preparatory mathematics that include the topics covered in elementary and advanced algebra, and two- and three-dimensional geometry. Approved integrated math courses may be used to fulfill part of all of this requirement as may math courses taken in the seventh and eigth grades that the high school accepts as equivalent to its own math courses.

"D" Laboratory Science – 2 years required, 3 recommended
Two years of laboratory science providing fundamental knowledge in at least two of these three disciplines: biology (which includes anatomy, physiology, marine biology, aquatic biology, etc.), chemistry, and physics. Laboratory courses in earth/space sciences are acceptable if they have as prerequisites or provide basic knowledge in biology, chemistry, or physics. The appropriate two years of an approved integrated science program may be used to fulfill this requirement. Not more than one year of ninth-grade laboratory science can be used to meet this requirement.

"E" Language other than English – 2 years required, 3 years recommended.
Two years of the same language other than English. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, and composition. Courses in a language other than English taken in the seventh and eight grades

may be used to fulfill this part of the requirement if the high school accepts them as equivalent to its own courses.

"F" Visual and Performing Arts – 1 year required
One year of either dance, drama/theater, music, or visual arts is acceptable.

"G" College Prep Electives – 1 year required
One year (two semesters), in addition to those required in the "A-F" categories above, chosen from the following areas: visual and performing arts, history, social science, English, advanced math, laboratory science, and language other than English (a third year in the language used for the "E" requirement or two years of another language).

Appendix B

Student Characteristics – Matched Sample

9A

	logsch	ethnic	attend	gender	meal6f	lang			
	0 nonpart	0 minority	0<75days	0 male	0 pay	0 LEP	Pi	freq	% freq
	1 part	**1 white As**	**1>75days**	**1 female**	**1 free, red**	**1 EP**			
1	0.4773	0.3001	**0.5428**	**0.2148**	**-0.00545**	**1.4089**	**0.703**	1498	8.81
2	0.4773	**0.3001**	0.5428	**0.2148**	**-0.00545**	**1.4089**	**0.650**	38	0.22
3	0.4773	**0.3001**	**0.5428**	0.2148	**-0.00545**	**1.4089**	**0.720**	187	1.1
4	0.4773	**0.3001**	**0.5428**	**0.2148**	-0.00545	**1.4089**	**0.763**	116	0.68
5	0.4773	**0.3001**	**0.5428**	**0.2148**	**-0.00545**	1.4089	**0.438**	51	0.3
6	0.4773	0.3001	0.5428	**0.2148**	**-0.00545**	**1.4089**	**0.579**	891	5.24
7	0.4773	0.3001	**0.5428**	0.2148	**-0.00545**	**1.4089**	**0.656**	1510	8.88
8	0.4773	0.3001	**0.5428**	**0.2148**	-0.00545	**1.4089**	**0.704**	371	2.18
9	0.4773	0.3001	**0.5428**	**0.2148**	**-0.00545**	1.4089	**0.366**	569	3.34
10	0.4773	**0.3001**	0.5428	0.2148	**-0.00545**	**1.4089**	**0.600**	58	0.34
11	0.4773	**0.3001**	0.5428	**0.2148**	-0.00545	**1.4089**	**0.651**	42	0.25
12	0.4773	**0.3001**	0.5428	**0.2148**	**-0.00545**	1.4089	**0.312**	26	0.15
13	0.4773	**0.3001**	**0.5428**	0.2148	-0.00545	**1.4089**	**0.721**	134	0.79
14	0.4773	**0.3001**	**0.5428**	0.2148	**-0.00545**	1.4089	**0.386**	65	0.38
15	0.4773	**0.3001**	**0.5428**	**0.2148**	-0.00545	1.4089	**0.440**	6	0.04
16	0.4773	0.3001	0.5428	0.2148	**-0.00545**	**1.4089**	**0.526**	852	5.01
17	0.4773	0.3001	0.5428	**0.2148**	-0.00545	**1.4089**	**0.580**	293	1.72
18	0.4773	0.3001	0.5428	**0.2148**	**-0.00545**	1.4089	**0.251**	533	3.13
19	0.4773	0.3001	**0.5428**	0.2148	-0.00545	**1.4089**	**0.657**	303	1.78
20	0.4773	0.3001	**0.5428**	0.2148	**-0.00545**	1.4089	**0.318**	805	4.73
21	0.4773	0.3001	**0.5428**	**0.2148**	-0.00545	1.4089	**0.368**	42	0.25
22	0.4773	**0.3001**	**0.5428**	0.2148	-0.00545	1.4089	**0.388**	7	0.04
23	0.4773	**0.3001**	0.5428	**0.2148**	-0.00545	1.4089	**0.313**	8	0.05
24	0.4773	**0.3001**	0.5428	0.2148	**-0.00545**	1.4089	**0.268**	30	0.18
25	0.4773	**0.3001**	0.5428	0.2148	-0.00545	**1.4089**	**0.601**	51	0.3
26	0.4773	0.3001	0.5428	0.2148	-0.00545	**1.4089**	**0.527**	257	1.51
27	0.4773	0.3001	0.5428	0.2148	**-0.00545**	1.4089	**0.213**	664	3.9
28	0.4773	**0.3001**	0.5428	0.2148	-0.00545	1.4089	**0.269**	6	0.04
29	0.4773	0.3001	**0.5428**	0.2148	-0.00545	1.4089	**0.319**	52	0.31
30	0.4773	0.3001	0.5428	**0.2148**	-0.00545	1.4089	**0.253**	104	0.61
31	0.4773	0.3001	0.5428	0.2148	-0.00545	1.4089	**0.214**	106	0.62
32	0.4773	**0.3001**	**0.5428**	**0.2148**	**-0.00545**	**1.4089**	**0.762**	180	1.06
33	**0.4773**	0.3001	**0.5428**	**0.2148**	**-0.00545**	**1.4089**	**0.792**	1039	6.11
34	**0.4773**	**0.3001**	0.5428	**0.2148**	**-0.00545**	**1.4089**	**0.749**	6	0.04
35	**0.4773**	**0.3001**	**0.5428**	0.2148	**-0.00545**	**1.4089**	**0.806**	26	0.15
36	**0.4773**	**0.3001**	**0.5428**	**0.2148**	-0.00545	**1.4089**	**0.838**	63	0.37

37	**0.4773**	**0.3001**	**0.5428**	**0.2148**	**-0.00545**	1.4089	**0.557**	1	0.01
38	**0.4773**	0.3001	0.5428	**0.2148**	**-0.00545**	**1.4089**	**0.689**	912	5.36
39	**0.4773**	0.3001	**0.5428**	0.2148	**-0.00545**	**1.4089**	**0.755**	974	5.73
40	**0.4773**	0.3001	**0.5428**	**0.2148**	-0.00545	**1.4089**	**0.793**	211	1.24
41	**0.4773**	0.3001	**0.5428**	**0.2148**	**-0.00545**	1.4089	**0.482**	384	2.26
42	**0.4773**	**0.3001**	0.5428	0.2148	**-0.00545**	**1.4089**	**0.707**	7	0.04
43	**0.4773**	**0.3001**	0.5428	**0.2148**	-0.00545	**1.4089**	**0.750**	3	0.02
44	**0.4773**	**0.3001**	0.5428	**0.2148**	**-0.00545**	1.4089	**0.422**	0	0
45	**0.4773**	**0.3001**	**0.5428**	0.2148	-0.00545	**1.4089**	**0.807**	48	0.28
46	**0.4773**	**0.3001**	**0.5428**	0.2148	**-0.00545**	1.4089	**0.504**	7	0.04
47	**0.4773**	**0.3001**	**0.5428**	**0.2148**	-0.00545	1.4089	**0.558**	0	0
48	**0.4773**	0.3001	0.5428	0.2148	**-0.00545**	**1.4089**	**0.641**	918	5.4
49	**0.4773**	0.3001	0.5428	**0.2148**	-0.00545	**1.4089**	**0.690**	156	0.92
50	**0.4773**	0.3001	0.5428	**0.2148**	**-0.00545**	1.4089	**0.351**	695	4.09
51	**0.4773**	0.3001	**0.5428**	0.2148	-0.00545	**1.4089**	**0.756**	187	1.1
52	**0.4773**	0.3001	**0.5428**	0.2148	**-0.00545**	1.4089	**0.429**	449	2.64
53	**0.4773**	0.3001	**0.5428**	**0.2148**	-0.00545	1.4089	**0.484**	25	0.15
54	**0.4773**	**0.3001**	**0.5428**	0.2148	-0.00545	1.4089	**0.505**	2	0.01
55	**0.4773**	**0.3001**	0.5428	**0.2148**	-0.00545	1.4089	**0.424**	2	0.01
56	**0.4773**	**0.3001**	0.5428	0.2148	**-0.00545**	1.4089	**0.371**	0	0
57	**0.4773**	**0.3001**	0.5428	0.2148	-0.00545	**1.4089**	**0.708**	8	0.05
58	**0.4773**	0.3001	0.5428	0.2148	-0.00545	**1.4089**	**0.642**	159	0.93
59	**0.4773**	0.3001	0.5428	0.2148	**-0.00545**	1.4089	**0.304**	707	4.16
60	**0.4773**	**0.3001**	0.5428	0.2148	-0.00545	1.4089	**0.372**	0	0
61	**0.4773**	0.3001	**0.5428**	0.2148	-0.00545	1.4089	**0.430**	29	0.17
62	**0.4773**	0.3001	0.5428	**0.2148**	-0.00545	1.4089	**0.353**	54	0.32
63	**0.4773**	0.3001	0.5428	0.2148	-0.00545	1.4089	**0.305**	66	0.39
64	**0.4773**	**0.3001**	**0.5428**	**0.2148**	**-0.00545**	**1.4089**	**0.837**	20	0.12

11B

	logsch	ethnic	attend	gender	meal6f	lang	Pi	freq	% freq
	0 nonpart	0 minority	0<75days	0 male	0 pay	0 LEP			
	1 part	**1 white As**	**1>75days**	**1 female**	**1 free, red**	**1 EP**			
1	0.6174	0.8676	**0.8517**	**0.3209**	**0.0873**	**1.5738**	**0.217**	1498	8.81
2	0.6174	**0.8676**	0.8517	**0.3209**	**0.0873**	**1.5738**	**0.220**	38	0.22
3	0.6174	**0.8676**	**0.8517**	0.3209	**0.0873**	**1.5738**	**0.324**	187	1.1
4	0.6174	**0.8676**	**0.8517**	**0.3209**	0.0873	**1.5738**	**0.377**	116	0.68
5	0.6174	**0.8676**	**0.8517**	**0.3209**	**0.0873**	1.5738	**0.120**	51	0.3
6	0.6174	0.8676	0.8517	**0.3209**	**0.0873**	**1.5738**	**0.106**	891	5.24
7	0.6174	0.8676	**0.8517**	0.3209	**0.0873**	**1.5738**	**0.167**	1510	8.88
8	0.6174	0.8676	**0.8517**	**0.3209**	0.0873	**1.5738**	**0.203**	371	2.18
9	0.6174	0.8676	**0.8517**	**0.3209**	**0.0873**	1.5738	**0.054**	569	3.34
10	0.6174	**0.8676**	0.8517	0.3209	**0.0873**	**1.5738**	**0.170**	58	0.34

11	0.6174	**0.8676**	0.8517	**0.3209**	0.0873	**1.5738**	**0.205**	42	0.25
12	0.6174	**0.8676**	0.8517	**0.3209**	**0.0873**	1.5738	**0.055**	26	0.15
13	0.6174	**0.8676**	**0.8517**	0.3209	0.0873	**1.5738**	**0.305**	134	0.79
14	0.6174	**0.8676**	**0.8517**	0.3209	**0.0873**	1.5738	**0.090**	65	0.38
15	0.6174	**0.8676**	**0.8517**	**0.3209**	0.0873	1.5738	**0.111**	6	0.04
16	0.6174	0.8676	0.8517	0.3209	**0.0873**	**1.5738**	**0.079**	852	5.01
17	0.6174	0.8676	0.8517	**0.3209**	0.0873	**1.5738**	**0.098**	293	1.72
18	0.6174	0.8676	0.8517	**0.3209**	**0.0873**	1.5738	**0.024**	533	3.13
19	0.6174	0.8676	**0.8517**	0.3209	0.0873	**1.5738**	**0.156**	303	1.78
20	0.6174	0.8676	**0.8517**	0.3209	**0.0873**	1.5738	**0.040**	805	4.73
21	0.6174	0.8676	**0.8517**	**0.3209**	0.0873	1.5738	**0.050**	42	0.25
22	0.6174	**0.8676**	**0.8517**	0.3209	0.0873	1.5738	**0.083**	7	0.04
23	0.6174	**0.8676**	0.8517	**0.3209**	0.0873	1.5738	**0.051**	8	0.05
24	0.6174	**0.8676**	0.8517	0.3209	**0.0873**	1.5738	**0.041**	30	0.18
25	0.6174	**0.8676**	0.8517	0.3209	0.0873	**1.5738**	**0.158**	51	0.3
26	0.6174	0.8676	0.8517	0.3209	0.0873	**1.5738**	**0.073**	257	1.51
27	0.6174	0.8676	0.8517	0.3209	**0.0873**	1.5738	**0.017**	664	3.9
28	0.6174	**0.8676**	0.8517	0.3209	0.0873	1.5738	**0.037**	6	0.04
29	0.6174	0.8676	**0.8517**	0.3209	0.0873	1.5738	**0.037**	52	0.31
30	0.6174	0.8676	0.8517	**0.3209**	0.0873	1.5738	**0.022**	104	0.61
31	0.6174	0.8676	0.8517	0.3209	0.0873	1.5738	**0.016**	106	0.62
32	0.6174	**0.8676**	**0.8517**	**0.3209**	**0.0873**	**1.5738**	**0.398**	180	1.06
33	**0.6174**	0.8676	**0.8517**	**0.3209**	**0.0873**	**1.5738**	**0.340**	1039	6.11
34	**0.6174**	**0.8676**	0.8517	**0.3209**	**0.0873**	**1.5738**	**0.343**	6	0.04
35	**0.6174**	**0.8676**	**0.8517**	0.3209	**0.0873**	**1.5738**	**0.470**	26	0.15
36	**0.6174**	**0.8676**	**0.8517**	**0.3209**	0.0873	**1.5738**	**0.529**	63	0.37
37	**0.6174**	**0.8676**	**0.8517**	**0.3209**	**0.0873**	1.5738	**0.202**	1	0.01
38	**0.6174**	0.8676	0.8517	**0.3209**	**0.0873**	**1.5738**	**0.180**	912	5.36
39	**0.6174**	0.8676	**0.8517**	0.3209	**0.0873**	**1.5738**	**0.272**	974	5.73
40	**0.6174**	0.8676	**0.8517**	**0.3209**	0.0873	**1.5738**	**0.320**	211	1.24
41	**0.6174**	0.8676	**0.8517**	**0.3209**	**0.0873**	1.5738	**0.096**	384	2.26
42	**0.6174**	**0.8676**	0.8517	0.3209	**0.0873**	**1.5738**	**0.275**	7	0.04
43	**0.6174**	**0.8676**	0.8517	**0.3209**	0.0873	**1.5738**	**0.324**	3	0.02
44	**0.6174**	**0.8676**	0.8517	**0.3209**	**0.0873**	1.5738	**0.098**	0	0
45	**0.6174**	**0.8676**	**0.8517**	0.3209	0.0873	**1.5738**	**0.449**	48	0.28
46	**0.6174**	**0.8676**	**0.8517**	0.3209	**0.0873**	1.5738	**0.155**	7	0.04
47	**0.6174**	**0.8676**	**0.8517**	**0.3209**	0.0873	1.5738	**0.189**	0	0
48	**0.6174**	0.8676	0.8517	0.3209	**0.0873**	**1.5738**	**0.137**	918	5.4
49	**0.6174**	0.8676	0.8517	**0.3209**	0.0873	**1.5738**	**0.167**	156	0.92
50	**0.6174**	0.8676	0.8517	**0.3209**	**0.0873**	1.5738	**0.043**	695	4.09
51	**0.6174**	0.8676	**0.8517**	0.3209	0.0873	**1.5738**	**0.255**	187	1.1
52	**0.6174**	0.8676	**0.8517**	0.3209	**0.0873**	1.5738	**0.072**	449	2.64
53	**0.6174**	0.8676	**0.8517**	**0.3209**	0.0873	1.5738	**0.089**	25	0.15
54	**0.6174**	**0.8676**	**0.8517**	0.3209	0.0873	1.5738	**0.144**	2	0.01
55	**0.6174**	**0.8676**	0.8517	**0.3209**	0.0873	1.5738	**0.090**	2	0.01
56	**0.6174**	**0.8676**	0.8517	0.3209	**0.0873**	1.5738	**0.073**	0	0

57	**0.6174**	**0.8676**	0.8517	0.3209	0.0873	**1.5738**	**0.258**	8	0.05
58	**0.6174**	0.8676	0.8517	0.3209	0.0873	**1.5738**	**0.127**	159	0.93
59	**0.6174**	0.8676	0.8517	0.3209	**0.0873**	1.5738	**0.032**	707	4.16
60	**0.6174**	**0.8676**	0.8517	0.3209	0.0873	1.5738	**0.067**	0	0
61	**0.6174**	0.8676	**0.8517**	0.3209	0.0873	1.5738	**0.066**	29	0.17
62	**0.6174**	0.8676	0.8517	**0.3209**	0.0873	1.5738	**0.040**	54	0.32
63	**0.6174**	0.8676	0.8517	0.3209	0.0873	1.5738	**0.029**	66	0.39
64	**0.6174**	**0.8676**	**0.8517**	**0.3209**	**0.0873**	**1.5738**	**0.550**	20	0.12

Student Characteristics –Total Sample

9A

	logsch	ethnic	attend	gender	meal6f	lang	z		
	0 nonpart	0 minority	0<75days	0 male	0 pay	0 LEP	Pi	freq	% freq
	1 part	**1 white As**	**1>75days**	**1 female**	**1 free, red**	**1 EP**	a		
1	0.4853	0.5108	**0.6412**	**0.2075**	**-0.0945**	**1.4745**	**0.714**	2507	8.81
2	0.4853	**0.5108**	0.6412	**0.2075**	**-0.0945**	**1.4745**	**0.686**	107	0.22
3	0.4853	**0.5108**	**0.6412**	0.2075	**-0.0945**	**1.4745**	**0.771**	725	1.1
4	0.4853	**0.5108**	**0.6412**	**0.2075**	-0.0945	**1.4745**	**0.820**	1522	0.68
5	0.4853	**0.5108**	**0.6412**	**0.2075**	**-0.0945**	1.4745	**0.487**	149	0.3
6	0.4853	0.5108	0.6412	**0.2075**	**-0.0945**	**1.4745**	**0.567**	1272	5.24
7	0.4853	0.5108	**0.6412**	0.2075	**-0.0945**	**1.4745**	**0.669**	2583	8.88
8	0.4853	0.5108	**0.6412**	**0.2075**	-0.0945	**1.4745**	**0.732**	1257	2.18
9	0.4853	0.5108	**0.6412**	**0.2075**	**-0.0945**	1.4745	**0.363**	875	3.34
10	0.4853	**0.5108**	0.6412	0.2075	**-0.0945**	**1.4745**	**0.640**	167	0.34
11	0.4853	**0.5108**	0.6412	**0.2075**	-0.0945	**1.4745**	**0.706**	199	0.25
12	0.4853	**0.5108**	0.6412	**0.2075**	**-0.0945**	1.4745	**0.334**	69	0.15
13	0.4853	**0.5108**	**0.6412**	0.2075	-0.0945	**1.4745**	**0.788**	1508	0.79
14	0.4853	**0.5108**	**0.6412**	0.2075	**-0.0945**	1.4745	**0.436**	229	0.38
15	0.4853	**0.5108**	**0.6412**	**0.2075**	-0.0945	1.4745	**0.511**	58	0.04
16	0.4853	0.5108	0.6412	0.2075	**-0.0945**	**1.4745**	**0.516**	1225	5.01
17	0.4853	0.5108	0.6412	**0.2075**	-0.0945	**1.4745**	**0.591**	578	1.72
18	0.4853	0.5108	0.6412	**0.2075**	**-0.0945**	1.4745	**0.231**	735	3.13
19	0.4853	0.5108	**0.6412**	0.2075	-0.0945	**1.4745**	**0.690**	1013	1.78
20	0.4853	0.5108	**0.6412**	0.2075	**-0.0945**	1.4745	**0.317**	1219	4.73
21	0.4853	0.5108	**0.6412**	**0.2075**	-0.0945	1.4745	**0.385**	124	0.25
22	0.4853	**0.5108**	**0.6412**	0.2075	-0.0945	1.4745	**0.459**	45	0.04
23	0.4853	**0.5108**	0.6412	**0.2075**	-0.0945	1.4745	**0.355**	18	0.05
24	0.4853	**0.5108**	0.6412	0.2075	**-0.0945**	1.4745	**0.289**	87	0.18
25	0.4853	**0.5108**	0.6412	0.2075	-0.0945	**1.4745**	**0.661**	217	0.3
26	0.4853	0.5108	0.6412	0.2075	-0.0945	**1.4745**	**0.540**	480	1.51
27	0.4853	0.5108	0.6412	0.2075	**-0.0945**	1.4745	**0.196**	907	3.9
28	0.4853	**0.5108**	0.6412	0.2075	-0.0945	1.4745	**0.309**	20	0.04
29	0.4853	0.5108	**0.6412**	0.2075	-0.0945	1.4745	**0.337**	146	0.31
30	0.4853	0.5108	0.6412	**0.2075**	-0.0945	1.4745	**0.248**	161	0.61

31	0.4853	0.5108	0.6412	0.2075	-0.0945	1.4745	**0.212**	174	0.62
32	0.4853	**0.5108**	**0.6412**	**0.2075**	**-0.0945**	**1.4745**	**0.806**	650	1.06
33	**0.4853**	0.5108	**0.6412**	**0.2075**	**-0.0945**	**1.4745**	**0.802**	1039	6.11
35	**0.4853**	**0.5108**	**0.6412**	0.2075	**-0.0945**	**1.4745**	**0.846**	26	0.15
36	**0.4853**	**0.5108**	**0.6412**	**0.2075**	-0.0945	**1.4745**	**0.881**	63	0.37
38	**0.4853**	0.5108	0.6412	**0.2075**	**-0.0945**	**1.4745**	**0.681**	912	5.36
39	**0.4853**	0.5108	**0.6412**	0.2075	**-0.0945**	**1.4745**	**0.767**	974	5.73
40	**0.4853**	0.5108	**0.6412**	**0.2075**	-0.0945	**1.4745**	**0.816**	211	1.24
41	**0.4853**	0.5108	**0.6412**	**0.2075**	**-0.0945**	1.4745	**0.481**	384	2.26
45	**0.4853**	**0.5108**	**0.6412**	0.2075	-0.0945	**1.4745**	**0.858**	48	0.28
48	**0.4853**	0.5108	0.6412	0.2075	**-0.0945**	**1.4745**	**0.634**	918	5.4
49	**0.4853**	0.5108	0.6412	**0.2075**	-0.0945	**1.4745**	**0.701**	156	0.92
50	**0.4853**	0.5108	0.6412	**0.2075**	**-0.0945**	1.4745	**0.328**	695	4.09
51	**0.4853**	0.5108	**0.6412**	0.2075	-0.0945	**1.4745**	**0.783**	187	1.1
52	**0.4853**	0.5108	**0.6412**	0.2075	**-0.0945**	1.4745	**0.429**	449	2.64
53	**0.4853**	0.5108	**0.6412**	**0.2075**	-0.0945	1.4745	**0.505**	25	0.15
58	**0.4853**	0.5108	0.6412	0.2075	-0.0945	**1.4745**	**0.656**	159	0.93
59	**0.4853**	0.5108	0.6412	0.2075	**-0.0945**	1.4745	**0.284**	707	4.16
61	**0.4853**	0.5108	**0.6412**	0.2075	-0.0945	1.4745	**0.453**	29	0.17
62	**0.4853**	0.5108	0.6412	**0.2075**	-0.0945	1.4745	**0.349**	54	0.32
63	**0.4853**	0.5108	0.6412	0.2075	-0.0945	1.4745	**0.304**	66	0.39
64	**0.4853**	**0.5108**	**0.6412**	**0.2075**	**-0.0945**	**1.4745**	**0.871**	20	0.12

11B

	logsch	ethnic	attend	gender	meal6f	lang	Pi	freq	% freq
	0 nonpart	0 minority	0<75days	0 male	0 pay	0 LEP	o		
	1 part	**1 white As**	**1>75days**	**1 female**	**1 free, red**	**1 EP**	a		
1	0.6051	0.9349	**0.9997**	**0.2867**	**0.0151**	**1.6682**	**0.225**	2507	8.81
2	0.6051	**0.9349**	0.9997	**0.2867**	**0.0151**	**1.6682**	**0.214**	107	0.22
3	0.6051	**0.9349**	**0.9997**	0.2867	**0.0151**	**1.6682**	**0.357**	725	1.1
4	0.6051	**0.9349**	**0.9997**	**0.2867**	0.0151	**1.6682**	**0.421**	1522	0.68
5	0.6051	**0.9349**	**0.9997**	**0.2867**	**0.0151**	1.6682	**0.122**	149	0.3
6	0.6051	0.9349	0.9997	**0.2867**	**0.0151**	**1.6682**	**0.096**	1272	5.24
7	0.6051	0.9349	**0.9997**	0.2867	**0.0151**	**1.6682**	**0.179**	2583	8.88
8	0.6051	0.9349	**0.9997**	**0.2867**	0.0151	**1.6682**	**0.222**	1257	2.18
9	0.6051	0.9349	**0.9997**	**0.2867**	**0.0151**	1.6682	**0.052**	875	3.34
10	0.6051	**0.9349**	0.9997	0.2867	**0.0151**	**1.6682**	**0.169**	167	0.34
11	0.6051	**0.9349**	0.9997	**0.2867**	0.0151	**1.6682**	**0.211**	199	0.25
12	0.6051	**0.9349**	0.9997	**0.2867**	**0.0151**	1.6682	**0.049**	69	0.15
13	0.6051	**0.9349**	**0.9997**	0.2867	0.0151	**1.6682**	**0.353**	1508	0.79
14	0.6051	**0.9349**	**0.9997**	0.2867	**0.0151**	1.6682	**0.095**	229	0.38
15	0.6051	**0.9349**	**0.9997**	**0.2867**	0.0151	1.6682	**0.121**	58	0.04
16	0.6051	0.9349	0.9997	0.2867	**0.0151**	**1.6682**	**0.074**	1225	5.01
17	0.6051	0.9349	0.9997	**0.2867**	0.0151	**1.6682**	**0.095**	578	1.72

18	0.6051	0.9349	0.9997	**0.2867**	**0.0151**	1.6682	**0.020**	735	3.13
19	0.6051	0.9349	**0.9997**	0.2867	0.0151	**1.6682**	**0.177**	1013	1.78
20	0.6051	0.9349	**0.9997**	0.2867	**0.0151**	1.6682	**0.039**	1219	4.73
21	0.6051	0.9349	**0.9997**	**0.2867**	0.0151	1.6682	**0.051**	124	0.25
22	0.6051	**0.9349**	**0.9997**	0.2867	0.0151	1.6682	**0.093**	45	0.04
23	0.6051	**0.9349**	0.9997	**0.2867**	0.0151	1.6682	**0.048**	18	0.05
24	0.6051	**0.9349**	0.9997	0.2867	**0.0151**	1.6682	**0.037**	87	0.18
25	0.6051	**0.9349**	0.9997	0.2867	0.0151	**1.6682**	**0.167**	217	0.3
26	0.6051	0.9349	0.9997	0.2867	0.0151	**1.6682**	**0.073**	480	1.51
27	0.6051	0.9349	0.9997	0.2867	**0.0151**	1.6682	**0.015**	907	3.9
28	0.6051	**0.9349**	0.9997	0.2867	0.0151	1.6682	**0.037**	20	0.04
29	0.6051	0.9349	**0.9997**	0.2867	0.0151	1.6682	**0.039**	146	0.31
30	0.6051	0.9349	0.9997	**0.2867**	0.0151	1.6682	**0.019**	161	0.61
31	0.6051	0.9349	0.9997	0.2867	0.0151	1.6682	**0.015**	174	0.62
32	0.6051	**0.9349**	**0.9997**	**0.2867**	**0.0151**	**1.6682**	**0.425**	650	1.06
33	**0.6051**	0.9349	**0.9997**	**0.2867**	**0.0151**	**1.6682**	**0.347**	1039	6.11
35	**0.6051**	**0.9349**	**0.9997**	0.2867	**0.0151**	**1.6682**	**0.504**	26	0.15
36	**0.6051**	**0.9349**	**0.9997**	**0.2867**	0.0151	**1.6682**	**0.571**	63	0.37
38	**0.6051**	0.9349	0.9997	**0.2867**	**0.0151**	**1.6682**	**0.163**	912	5.36
39	**0.6051**	0.9349	**0.9997**	0.2867	**0.0151**	**1.6682**	**0.285**	974	5.73
40	**0.6051**	0.9349	**0.9997**	**0.2867**	0.0151	**1.6682**	**0.343**	211	1.24
41	**0.6051**	0.9349	**0.9997**	**0.2867**	**0.0151**	1.6682	**0.091**	384	2.26
45	**0.6051**	**0.9349**	**0.9997**	0.2867	0.0151	**1.6682**	**0.500**	48	0.28
48	**0.6051**	0.9349	0.9997	0.2867	**0.0151**	**1.6682**	**0.128**	918	5.4
49	**0.6051**	0.9349	0.9997	**0.2867**	0.0151	**1.6682**	**0.161**	156	0.92
50	**0.6051**	0.9349	0.9997	**0.2867**	**0.0151**	1.6682	**0.036**	695	4.09
51	**0.6051**	0.9349	**0.9997**	0.2867	0.0151	**1.6682**	**0.282**	187	1.1
52	**0.6051**	0.9349	**0.9997**	0.2867	**0.0151**	1.6682	**0.070**	449	2.64
53	**0.6051**	0.9349	**0.9997**	**0.2867**	0.0151	1.6682	**0.090**	25	0.15
58	**0.6051**	0.9349	0.9997	0.2867	0.0151	**1.6682**	**0.126**	159	0.93
59	**0.6051**	0.9349	0.9997	0.2867	**0.0151**	1.6682	**0.027**	707	4.16
61	**0.6051**	0.9349	**0.9997**	0.2867	0.0151	1.6682	**0.069**	29	0.17
62	**0.6051**	0.9349	0.9997	**0.2867**	0.0151	1.6682	**0.035**	54	0.32
63	**0.6051**	0.9349	0.9997	0.2867	0.0151	1.6682	**0.027**	66	0.39
64	**0.6051**	**0.9349**	**0.9997**	**0.2867**	**0.0151**	**1.6682**	**0.575**	20	0.12

Student Characteristics and Math Course Grades - Matched Sample

9A

	logsch	ethnic	lang	gender	alg1p	geop			
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F	Pi	freq	% freq
	1 part	**1 white, Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
1	0.2838	-0.2929	**1.3081**	**0.1037**	**2.3193**	**0.7369**	**0.956**	482	2.66
3	0.2838	**-0.2929**	**1.3081**	0.1037	**2.3193**	**0.7369**	**0.935**	139	0.77
4	0.2838	**-0.2929**	**1.3081**	**0.1037**	2.3193	**0.7369**	**0.612**	30	0.17
5	0.2838	**-0.2929**	**1.3081**	**0.1037**	**2.3193**	0.7369	**0.885**	74	0.41
6	0.2838	-0.2929	1.3081	**0.1037**	**2.3193**	**0.7369**	**0.853**	59	0.33
7	0.2838	-0.2929	**1.3081**	0.1037	**2.3193**	**0.7369**	**0.951**	370	2.04
8	0.2838	-0.2929	**1.3081**	**0.1037**	2.3193	**0.7369**	**0.679**	156	0.86
9	0.2838	-0.2929	**1.3081**	**0.1037**	**2.3193**	0.7369	**0.911**	504	2.79
10	0.2838	**-0.2929**	1.3081	0.1037	**2.3193**	**0.7369**	**0.796**	25	0.14
13	0.2838	**-0.2929**	**1.3081**	0.1037	2.3193	**0.7369**	**0.587**	40	0.22
14	0.2838	**-0.2929**	**1.3081**	0.1037	**2.3193**	0.7369	**0.874**	78	0.43
15	0.2838	**-0.2929**	**1.3081**	**0.1037**	2.3193	0.7369	**0.430**	145	0.8
16	0.2838	-0.2929	1.3081	0.1037	**2.3193**	**0.7369**	**0.840**	64	0.35
17	0.2838	-0.2929	1.3081	**0.1037**	2.3193	**0.7369**	**0.364**	26	0.14
18	0.2838	-0.2929	1.3081	**0.1037**	**2.3193**	0.7369	**0.736**	107	0.59
19	0.2838	-0.2929	**1.3081**	0.1037	2.3193	**0.7369**	**0.656**	135	0.75
20	0.2838	-0.2929	**1.3081**	0.1037	**2.3193**	0.7369	**0.903**	374	2.07
21	0.2838	-0.2929	**1.3081**	**0.1037**	2.3193	0.7369	**0.503**	2105	11.63
22	0.2838	**-0.2929**	**1.3081**	0.1037	2.3193	0.7369	**0.405**	211	1.17
23	0.2838	**-0.2929**	1.3081	**0.1037**	2.3193	0.7369	**0.170**	61	0.34
26	0.2838	-0.2929	1.3081	0.1037	2.3193	**0.7369**	**0.340**	26	0.14
27	0.2838	-0.2929	1.3081	0.1037	**2.3193**	0.7369	**0.715**	115	0.64
28	0.2838	**-0.2929**	1.3081	0.1037	2.3193	0.7369	**0.155**	67	0.37
29	0.2838	-0.2929	**1.3081**	0.1037	2.3193	0.7369	**0.477**	2208	12.2
30	0.2838	-0.2929	1.3081	**0.1037**	2.3193	0.7369	**0.215**	1147	6.34
31	0.2838	-0.2929	1.3081	0.1037	2.3193	0.7369	**0.198**	1524	8.42
32	0.2838	**-0.2929**	**1.3081**	**0.1037**	**2.3193**	**0.7369**	**0.941**	152	0.84
33	**0.2838**	-0.2929	**1.3081**	**0.1037**	**2.3193**	**0.7369**	**0.966**	534	2.95
35	**0.2838**	**-0.2929**	**1.3081**	0.1037	**2.3193**	**0.7369**	**0.951**	41	0.23
38	**0.2838**	-0.2929	1.3081	**0.1037**	**2.3193**	**0.7369**	**0.885**	98	0.54
39	**0.2838**	-0.2929	**1.3081**	0.1037	**2.3193**	**0.7369**	**0.963**	408	2.25
40	**0.2838**	-0.2929	**1.3081**	**0.1037**	2.3193	**0.7369**	**0.737**	156	0.86
41	**0.2838**	-0.2929	**1.3081**	**0.1037**	**2.3193**	0.7369	**0.932**	430	2.38
47	**0.2838**	**-0.2929**	**1.3081**	**0.1037**	2.3193	0.7369	**0.501**	20	0.11
48	**0.2838**	-0.2929	1.3081	0.1037	**2.3193**	**0.7369**	**0.874**	82	0.45
49	**0.2838**	-0.2929	1.3081	**0.1037**	2.3193	**0.7369**	**0.432**	58	0.32
50	**0.2838**	-0.2929	1.3081	**0.1037**	**2.3193**	0.7369	**0.787**	164	0.91
51	**0.2838**	-0.2929	**1.3081**	0.1037	2.3193	**0.7369**	**0.717**	156	0.86

	logsch	ethnic	lang	gender	alg1p	geop			
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F	Pi	freq	% freq
	1 part	**1 white, Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
52	**0.2838**	-0.2929	**1.3081**	0.1037	**2.3193**	0.7369	**0.925**	351	1.94
53	**0.2838**	-0.2929	**1.3081**	**0.1037**	2.3193	0.7369	**0.573**	1337	7.39
54	**0.2838**	**-0.2929**	**1.3081**	0.1037	2.3193	0.7369	**0.475**	30	0.17
58	**0.2838**	-0.2929	1.3081	0.1037	2.3193	**0.7369**	**0.406**	48	0.27
59	**0.2838**	-0.2929	1.3081	0.1037	**2.3193**	0.7369	**0.769**	130	0.72
61	**0.2838**	-0.2929	**1.3081**	0.1037	2.3193	0.7369	**0.548**	1452	8.02
62	**0.2838**	-0.2929	1.3081	**0.1037**	2.3193	0.7369	**0.267**	906	5.01
63	**0.2838**	-0.2929	1.3081	0.1037	2.3193	0.7369	**0.247**	1084	5.99
64	**0.2838**	**-0.2929**	**1.3081**	**0.1037**	**2.3193**	**0.7369**	**0.955**	51	0.28

11B

	logsch	ethnic	lang	gender	alg1p	geop	Pi	freq	% freq
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F			
	1 part	**1 white,Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
1	0.3423	0.0842	**1.2555**	**0.1731**	**1.9182**	**2.1002**	**0.674**	482	2.66
3	0.3423	**0.0842**	**1.2555**	0.1731	**1.9182**	**2.1002**	**0.655**	139	0.77
4	0.3423	**0.0842**	**1.2555**	**0.1731**	1.9182	**2.1002**	**0.249**	30	0.17
5	0.3423	**0.0842**	**1.2555**	**0.1731**	**1.9182**	2.1002	**0.216**	74	0.41
6	0.3423	0.0842	1.2555	**0.1731**	**1.9182**	**2.1002**	**0.371**	59	0.33
7	0.3423	0.0842	**1.2555**	0.1731	**1.9182**	**2.1002**	**0.635**	370	2.04
8	0.3423	0.0842	**1.2555**	**0.1731**	1.9182	**2.1002**	**0.233**	156	0.86
9	0.3423	0.0842	**1.2555**	**0.1731**	**1.9182**	2.1002	**0.202**	504	2.79
10	0.3423	**0.0842**	1.2555	0.1731	**1.9182**	**2.1002**	**0.351**	25	0.14
13	0.3423	**0.0842**	**1.2555**	0.1731	1.9182	**2.1002**	**0.218**	40	0.22
14	0.3423	**0.0842**	**1.2555**	0.1731	**1.9182**	2.1002	**0.188**	78	0.43
15	0.3423	**0.0842**	**1.2555**	**0.1731**	1.9182	2.1002	**0.039**	145	0.8
16	0.3423	0.0842	1.2555	0.1731	**1.9182**	**2.1002**	**0.332**	64	0.35
17	0.3423	0.0842	1.2555	**0.1731**	1.9182	**2.1002**	**0.080**	26	0.14
18	0.3423	0.0842	1.2555	**0.1731**	**1.9182**	2.1002	**0.067**	107	0.59
19	0.3423	0.0842	**1.2555**	0.1731	1.9182	**2.1002**	**0.204**	135	0.75
20	0.3423	0.0842	**1.2555**	0.1731	**1.9182**	2.1002	**0.176**	374	2.07
21	0.3423	0.0842	**1.2555**	**0.1731**	1.9182	2.1002	**0.036**	2105	11.63
22	0.3423	**0.0842**	**1.2555**	0.1731	1.9182	2.1002	**0.033**	211	1.17
23	0.3423	**0.0842**	1.2555	**0.1731**	1.9182	2.1002	**0.011**	61	0.34
26	0.3423	0.0842	1.2555	0.1731	1.9182	**2.1002**	**0.068**	26	0.14
27	0.3423	0.0842	1.2555	0.1731	**1.9182**	2.1002	**0.057**	115	0.64
28	0.3423	**0.0842**	1.2555	0.1731	1.9182	2.1002	**0.010**	67	0.37
29	0.3423	0.0842	**1.2555**	0.1731	1.9182	2.1002	**0.030**	2208	12.2
30	0.3423	0.0842	1.2555	**0.1731**	1.9182	2.1002	**0.011**	1147	6.34
31	0.3423	0.0842	1.2555	0.1731	1.9182	2.1002	**0.009**	1524	8.42
32	0.3423	**0.0842**	**1.2555**	**0.1731**	**1.9182**	**2.1002**	**0.693**	152	0.84

	logsch	ethnic	lang	gender	alg1p	geop	Pi	freq	% freq
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F			
	1 part	**1 white,Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
33	**0.3423**	0.0842	**1.2555**	**0.1731**	**1.9182**	**2.1002**	**0.745**	534	2.95
35	**0.3423**	**0.0842**	**1.2555**	0.1731	**1.9182**	**2.1002**	**0.728**	41	0.23
38	**0.3423**	0.0842	1.2555	**0.1731**	**1.9182**	**2.1002**	**0.454**	98	0.54
39	**0.3423**	0.0842	**1.2555**	0.1731	**1.9182**	**2.1002**	**0.710**	408	2.25
40	**0.3423**	0.0842	**1.2555**	**0.1731**	1.9182	**2.1002**	**0.300**	156	0.86
41	**0.3423**	0.0842	**1.2555**	**0.1731**	**1.9182**	2.1002	**0.263**	430	2.38
47	**0.3423**	**0.0842**	**1.2555**	**0.1731**	1.9182	2.1002	**0.054**	20	0.11
48	**0.3423**	0.0842	1.2555	0.1731	**1.9182**	**2.1002**	**0.412**	82	0.45
49	**0.3423**	0.0842	1.2555	**0.1731**	1.9182	**2.1002**	**0.109**	58	0.32
50	**0.3423**	0.0842	1.2555	**0.1731**	**1.9182**	2.1002	**0.092**	164	0.91
51	**0.3423**	0.0842	**1.2555**	0.1731	1.9182	**2.1002**	**0.265**	156	0.86
52	**0.3423**	0.0842	**1.2555**	0.1731	**1.9182**	2.1002	**0.231**	351	1.94
53	**0.3423**	0.0842	**1.2555**	**0.1731**	1.9182	2.1002	**0.050**	1337	7.39
54	**0.3423**	**0.0842**	**1.2555**	0.1731	1.9182	2.1002	**0.046**	30	0.17
58	**0.3423**	0.0842	1.2555	0.1731	1.9182	**2.1002**	**0.093**	48	0.27
59	**0.3423**	0.0842	1.2555	0.1731	**1.9182**	2.1002	**0.079**	130	0.72
61	**0.3423**	0.0842	**1.2555**	0.1731	1.9182	2.1002	**0.042**	1452	8.02
62	**0.3423**	0.0842	1.2555	**0.1731**	1.9182	2.1002	**0.015**	906	5.01
63	**0.3423**	0.0842	1.2555	0.1731	1.9182	2.1002	**0.012**	1084	5.99
64	**0.3423**	**0.0842**	**1.2555**	**0.1731**	**1.9182**	**2.1002**	**0.760**	51	0.28

Student Characteristics and Math Course Grades – Total Sample

9A

	logsch	ethnic	lang	gender	alg1p	geop			
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F			
	1 part	**1 white,Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
1	0.253	-0.0377	**1.3908**	**0.09**	**2.5435**	**0.5603**	**0.959**	1026	3.39
2	0.253	**-0.0377**	1.3908	**0.09**	**2.5435**	**0.5603**	**0.849**	52	0.17
3	0.253	**-0.0377**	**1.3908**	0.09	**2.5435**	**0.5603**	**0.954**	1086	3.59
4	0.253	**-0.0377**	**1.3908**	**0.09**	2.5435	**0.5603**	**0.640**	251	0.83
5	0.253	**-0.0377**	**1.3908**	**0.09**	**2.5435**	0.5603	**0.928**	429	1.42
6	0.253	-0.0377	1.3908	**0.09**	**2.5435**	**0.5603**	**0.854**	94	0.31
7	0.253	-0.0377	**1.3908**	0.09	**2.5435**	**0.5603**	**0.956**	765	2.53
8	0.253	-0.0377	**1.3908**	**0.09**	2.5435	**0.5603**	**0.649**	327	1.08
9	0.253	-0.0377	**1.3908**	**0.09**	**2.5435**	0.5603	**0.931**	894	2.95
10	0.253	**-0.0377**	1.3908	0.09	**2.5435**	**0.5603**	**0.837**	74	0.24
11	0.253	**-0.0377**	1.3908	**0.09**	2.5435	**0.5603**	**0.307**	32	0.11
12	0.253	**-0.0377**	1.3908	**0.09**	**2.5435**	0.5603	**0.763**	52	0.17
13	0.253	**-0.0377**	**1.3908**	0.09	2.5435	**0.5603**	**0.619**	291	0.96

	logsch	ethnic	lang	gender	alg1p	geop			
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F			
	1 part	**1 white,Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
14	0.253	**-0.0377**	**1.3908**	0.09	**2.5435**	0.5603	**0.922**	427	1.41
15	0.253	**-0.0377**	**1.3908**	**0.09**	2.5435	0.5603	**0.504**	770	2.54
16	0.253	-0.0377	1.3908	0.09	**2.5435**	**0.5603**	**0.843**	96	0.32
17	0.253	-0.0377	1.3908	**0.09**	2.5435	**0.5603**	**0.315**	48	0.16
18	0.253	-0.0377	1.3908	**0.09**	**2.5435**	0.5603	**0.770**	166	0.55
19	0.253	-0.0377	**1.3908**	0.09	2.5435	**0.5603**	**0.628**	265	0.88
20	0.253	-0.0377	**1.3908**	0.09	**2.5435**	0.5603	**0.925**	686	2.27
21	0.253	-0.0377	**1.3908**	**0.09**	2.5435	0.5603	**0.513**	3780	12.49
22	0.253	**-0.0377**	**1.3908**	0.09	2.5435	0.5603	**0.482**	1025	3.39
23	0.253	**-0.0377**	1.3908	**0.09**	2.5435	0.5603	**0.202**	203	0.67
24	0.253	**-0.0377**	1.3908	0.09	**2.5435**	0.5603	**0.746**	61	0.2
25	0.253	**-0.0377**	1.3908	0.09	2.5435	**0.5603**	**0.288**	41	0.14
26	0.253	-0.0377	1.3908	0.09	2.5435	**0.5603**	**0.296**	49	0.16
27	0.253	-0.0377	1.3908	0.09	**2.5435**	0.5603	**0.753**	155	0.51
28	0.253	**-0.0377**	1.3908	0.09	2.5435	0.5603	**0.188**	253	0.84
29	0.253	-0.0377	**1.3908**	0.09	2.5435	0.5603	**0.491**	3958	13.08
30	0.253	-0.0377	1.3908	**0.09**	2.5435	0.5603	**0.208**	1745	5.77
31	0.253	-0.0377	1.3908	0.09	2.5435	0.5603	**0.194**	2329	7.7
32	0.253	**-0.0377**	**1.3908**	**0.09**	**2.5435**	**0.5603**	**0.958**	1226	4.05
33	**0.253**	-0.0377	**1.3908**	**0.09**	**2.5435**	**0.5603**	**0.968**	534	1.76
35	**0.253**	**-0.0377**	**1.3908**	0.09	**2.5435**	**0.5603**	**0.964**	41	0.14
38	**0.253**	-0.0377	1.3908	**0.09**	**2.5435**	**0.5603**	**0.883**	98	0.32
39	**0.253**	-0.0377	**1.3908**	0.09	**2.5435**	**0.5603**	**0.965**	408	1.35
40	**0.253**	-0.0377	**1.3908**	**0.09**	2.5435	**0.5603**	**0.704**	156	0.52
41	**0.253**	-0.0377	**1.3908**	**0.09**	**2.5435**	0.5603	**0.945**	430	1.42
47	**0.253**	**-0.0377**	**1.3908**	**0.09**	2.5435	0.5603	**0.567**	20	0.07
48	**0.253**	-0.0377	1.3908	0.09	**2.5435**	**0.5603**	**0.873**	82	0.27
49	**0.253**	-0.0377	1.3908	**0.09**	2.5435	**0.5603**	**0.372**	58	0.19
50	**0.253**	-0.0377	1.3908	**0.09**	**2.5435**	0.5603	**0.811**	164	0.54
51	**0.253**	-0.0377	**1.3908**	0.09	2.5435	**0.5603**	**0.685**	156	0.52
52	**0.253**	-0.0377	**1.3908**	0.09	**2.5435**	0.5603	**0.941**	351	1.16
53	**0.253**	-0.0377	**1.3908**	**0.09**	2.5435	0.5603	**0.576**	1337	4.42
54	**0.253**	**-0.0377**	**1.3908**	0.09	2.5435	0.5603	**0.545**	30	0.1
58	**0.253**	-0.0377	1.3908	0.09	2.5435	**0.5603**	**0.351**	48	0.16
59	**0.253**	-0.0377	1.3908	0.09	**2.5435**	0.5603	**0.797**	130	0.43
61	**0.253**	-0.0377	**1.3908**	0.09	2.5435	0.5603	**0.554**	1452	4.8
62	**0.253**	-0.0377	1.3908	**0.09**	2.5435	0.5603	**0.253**	906	2.99
63	**0.253**	-0.0377	1.3908	0.09	2.5435	0.5603	**0.236**	1084	3.58
64	**0.253**	**-0.0377**	**1.3908**	**0.09**	**2.5435**	**0.5603**	**0.967**	51	0.17

11B

	logsch	ethnic	lang	gender	alg1p	geop	Pi	freq	% freq
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F			
	1 part	**1 white,Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
1	0.3537	0.1118	**1.3279**	**0.1352**	**1.9395**	**2.1223**	**0.674**	1026	3.39
2	0.3537	**0.1118**	1.3279	**0.1352**	**1.9395**	**2.1223**	**0.380**	52	0.17
3	0.3537	**0.1118**	**1.3279**	0.1352	**1.9395**	**2.1223**	**0.669**	1086	3.59
4	0.3537	**0.1118**	**1.3279**	**0.1352**	1.9395	**2.1223**	**0.250**	251	0.83
5	0.3537	**0.1118**	**1.3279**	**0.1352**	**1.9395**	2.1223	**0.217**	429	1.42
6	0.3537	0.1118	1.3279	**0.1352**	**1.9395**	**2.1223**	**0.354**	94	0.31
7	0.3537	0.1118	**1.3279**	0.1352	**1.9395**	**2.1223**	**0.644**	765	2.53
8	0.3537	0.1118	**1.3279**	**0.1352**	1.9395	**2.1223**	**0.229**	327	1.08
9	0.3537	0.1118	**1.3279**	**0.1352**	**1.9395**	2.1223	**0.199**	894	2.95
10	0.3537	**0.1118**	1.3279	0.1352	**1.9395**	**2.1223**	**0.349**	74	0.24
11	0.3537	**0.1118**	1.3279	**0.1352**	1.9395	**2.1223**	**0.081**	32	0.11
12	0.3537	**0.1118**	1.3279	**0.1352**	**1.9395**	2.1223	**0.068**	52	0.17
13	0.3537	**0.1118**	**1.3279**	0.1352	1.9395	**2.1223**	**0.225**	291	0.96
14	0.3537	**0.1118**	**1.3279**	0.1352	**1.9395**	2.1223	**0.195**	427	1.41
15	0.3537	**0.1118**	**1.3279**	**0.1352**	1.9395	2.1223	**0.038**	770	2.54
16	0.3537	0.1118	1.3279	0.1352	**1.9395**	**2.1223**	**0.324**	96	0.32
17	0.3537	0.1118	1.3279	**0.1352**	1.9395	**2.1223**	**0.073**	48	0.16
18	0.3537	0.1118	1.3279	**0.1352**	**1.9395**	2.1223	**0.062**	166	0.55
19	0.3537	0.1118	**1.3279**	0.1352	1.9395	**2.1223**	**0.206**	265	0.88
20	0.3537	0.1118	**1.3279**	0.1352	**1.9395**	2.1223	**0.178**	686	2.27
21	0.3537	0.1118	**1.3279**	**0.1352**	1.9395	2.1223	**0.034**	3780	12.49
22	0.3537	**0.1118**	**1.3279**	0.1352	1.9395	2.1223	**0.034**	1025	3.39
23	0.3537	**0.1118**	1.3279	**0.1352**	1.9395	2.1223	**0.010**	203	0.67
24	0.3537	**0.1118**	1.3279	0.1352	**1.9395**	2.1223	**0.060**	61	0.2
25	0.3537	**0.1118**	1.3279	0.1352	1.9395	**2.1223**	**0.072**	41	0.14
26	0.3537	0.1118	1.3279	0.1352	1.9395	**2.1223**	**0.065**	49	0.16
27	0.3537	0.1118	1.3279	0.1352	**1.9395**	2.1223	**0.054**	155	0.51
28	0.3537	**0.1118**	1.3279	0.1352	1.9395	2.1223	**0.009**	253	0.84
29	0.3537	0.1118	**1.3279**	0.1352	1.9395	2.1223	**0.030**	3958	13.08
30	0.3537	0.1118	1.3279	**0.1352**	1.9395	2.1223	**0.009**	1745	5.77
31	0.3537	0.1118	1.3279	0.1352	1.9395	2.1223	**0.008**	2329	7.7
32	0.3537	**0.1118**	**1.3279**	**0.1352**	**1.9395**	**2.1223**	**0.698**	1226	4.05
33	**0.3537**	0.1118	**1.3279**	**0.1352**	**1.9395**	**2.1223**	**0.747**	534	1.76
35	**0.3537**	**0.1118**	**1.3279**	0.1352	**1.9395**	**2.1223**	**0.742**	41	0.14
38	**0.3537**	0.1118	1.3279	**0.1352**	**1.9395**	**2.1223**	**0.439**	98	0.32
39	**0.3537**	0.1118	**1.3279**	0.1352	**1.9395**	**2.1223**	**0.720**	408	1.35
40	**0.3537**	0.1118	**1.3279**	**0.1352**	1.9395	**2.1223**	**0.298**	156	0.52
41	**0.3537**	0.1118	**1.3279**	**0.1352**	**1.9395**	2.1223	**0.261**	430	1.42
47	**0.3537**	**0.1118**	**1.3279**	**0.1352**	1.9395	2.1223	**0.054**	20	0.07
48	**0.3537**	0.1118	1.3279	0.1352	**1.9395**	**2.1223**	**0.406**	82	0.27

	logsch	ethnic	lang	gender	alg1p	geop	Pi	freq	% freq
	0 nonpart	0 minority	0 ELL	0 male	0 D or F	1 D or F			
	1 part	**1 white,Asian**	**1 Eng prof**	**1 female**	**1 A,B, orC**	**2 A,B, orC**			
49	**0.3537**	0.1118	1.3279	**0.1352**	1.9395	**2.1223**	**0.101**	58	0.19
50	**0.3537**	0.1118	1.3279	**0.1352**	**1.9395**	2.1223	**0.086**	164	0.54
51	**0.3537**	0.1118	**1.3279**	0.1352	1.9395	**2.1223**	**0.270**	156	0.52
52	**0.3537**	0.1118	**1.3279**	0.1352	**1.9395**	2.1223	**0.236**	351	1.16
53	**0.3537**	0.1118	**1.3279**	**0.1352**	1.9395	2.1223	**0.048**	1337	4.42
54	**0.3537**	**0.1118**	**1.3279**	0.1352	1.9395	2.1223	**0.047**	30	0.1
58	**0.3537**	0.1118	1.3279	0.1352	1.9395	**2.1223**	**0.089**	48	0.16
59	**0.3537**	0.1118	1.3279	0.1352	**1.9395**	2.1223	**0.076**	130	0.43
61	**0.3537**	0.1118	**1.3279**	0.1352	1.9395	2.1223	**0.042**	1452	4.8
62	**0.3537**	0.1118	1.3279	**0.1352**	1.9395	2.1223	**0.013**	906	2.99
63	**0.3537**	0.1118	1.3279	0.1352	1.9395	2.1223	**0.012**	1084	3.58
64	**0.3537**	**0.1118**	**1.3279**	**0.1352**	**1.9395**	**2.1223**	**0.767**	51	0.17