RESEARCH REPORT 2018 – 4

Career & College Clubs and the College-Going Behavior of Youth from High-Poverty Middle Schools

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SUMMARY

This study is a baseline analysis of the effectiveness of a middle school intervention, Career & College Clubs, in increasing the eventual college enrollment of 8th-grade students who had access to the program through their schools during the program's second year of implementation. The program provides training sessions about college and career options, high school courses needed to prepare for college, and the college application and financial aid process. Enrollment data from the National Student Clearinghouse were used to compare the eventual college-going rates of 8th graders in program schools with those of a comparison group of 8th-grade students in non-program schools within the same districts. After applying inverse propensity weights to make the program and comparison samples comparable on program selection criteria and other observable characteristics, we did not find a statistically significant difference between college enrollment rates of students in program schools and those of students in non-program schools. Future research can assess the impact of the program on the college-going behavior of more recent student cohorts as the program has matured.

SO WHAT?

In this study, we used 2014-15 enrollment data from the National Student Clearinghouse to compare the college-going rates of 8th graders in schools with the Career & College Clubs program in the 2009-10 school year with those of a comparison group of 8th-grade students in non-program schools in the same districts that year. After applying inverse propensity weights to make the program and comparison samples comparable on the program selection criteria and other observable measures, we did not find a statistically significant difference between the college enrollment rates of students in program schools and those of students in non-program schools.

NOW WHAT?

The study limitations mentioned in our discussion point the way to further research that could be conducted on this program in order to have a better means of determining its effectiveness. First, data should be collected on how the program is implemented in the schools—how many students attend each of the trainings, the extent to which teachers deliver or modify the curriculum recommended by the program, and the types of outreach students conduct with their peers. Second, short-term pre- and post-program outcome indicators should be collected not only from students in the program, but also from their peers to gauge the extent of the participants' influence on their peers' career and college plans and expectations. Third, data needs to be collected on high school program participation and outcomes for students in both program and non-program schools to gauge whether high schools appear to be: 1) reinforcing the effects of the program, 2) allowing those effects to fade out, or 3) compensating for those effects by providing extra interventions for students from non-program schools who, perhaps, show a greater need for academic and non-academic support. Expanded data collection and research programs would enable educators not only to get a better fix on the program's ultimate impact, but also to improve the program based on feedback from short-term indicators.The discussion also points to reasons why the program may demonstrate greater effectiveness in future years. For example, the program is moving in the direction of a model that provides direct training to a higher percentage of students at each grade level. Even in the absence of training everyone, the program's curriculum has focused more extensively in recent years on training participants to inform and influence their peers.

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Abstract

This study is a baseline analysis of the effectiveness of a middle school intervention, Career & College Clubs, in increasing the eventual college enrollment of 8th-grade students who had access to the program through their schools during the program's second year of implementation. The program provides training sessions about college and career options, high school courses needed to prepare for college, and the college application and financial aid process. Enrollment data from the National Student Clearinghouse were used to compare the eventual college-going rates of 8th graders in program schools with those of a comparison group of 8th-grade students in non-program schools within the same districts. After applying inverse propensity weights to make the program and comparison samples comparable on program selection criteria and other observable characteristics, we did not find a statistically significant difference between college enrollment rates of students in program schools and those of students in non-program schools. Future research can assess the impact of the program on the college-going behavior of more recent student cohorts as the program has matured.

Career & College Clubs and the College-Going Behavior of Youth from High-Poverty Middle Schools

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Despite the well-documented economic benefits of acquiring a postsecondary degree or credential, many students do not reach this level of educational attainment, and there are large discrepancies in degree attainment by socioeconomic status (SES). In fact, within eight years of their expected high school graduation date, only 15% of individuals in the lowest socioeconomic quartile obtain a bachelor's degree or higher, while another 21% earn an associate's degree or other undergraduate postsecondary credential (Lauff & Ingels, 2014). In comparison, 61% of students in the highest socioeconomic quartile obtain a bachelor's degree or higher, and another 12% earn an associate's degree or undergraduate credential within that same time frame. Thus, over twice as many high-SES as low-SES students have some kind of postsecondary credential, and over four times as many have a bachelor's degree or higher.

Part of what drives this discrepancy in degree attainment by SES is discrepancy in college-going behavior. In addition to persistent and nontrivial differences by SES in academic readiness for college (ACT, 2015), students from low-income families are often less aware of their college options and how to pay for them (Avery, Howell, & Page, 2014). School counselors are often overstretched in their efforts to promote this awareness, as student-to-counselor ratios in high-poverty high schools in large districts average close to 300-to-1 (CLASP, 2015), and counselors often must devote most of their time with students to duties other than sharing information about college and career options (Parsad, Alexander, Farris, Hudson, & Greene, 2003).

The purpose of the current study is to examine the effectiveness of a middle school intervention, Career & College Clubs, in increasing the eventual college enrollment of 8th-grade students who had access to the program through their schools during the program's second year of implementation. The program is intended to have an effect not only on direct participants in the program's training sessions, but also on those students' peers (indirect participants). This study should be considered as a baseline for future evaluation efforts of the program, as we focus on the first year that peer-mentoring was included in the curriculum, and as the implementation of the peer-mentoring aspect of the program has changed over time. The study focuses on students' eventual college enrollment because a principal goal of the program is to increase college-going rates.

The Career & College Clubs Program

To increase college and career awareness among low-income middle-school students, the Career & College Clubs program was started in eight high-poverty middle schools in the 2008-09 school year (Cruce, Mattern, & Sconing, 2015), expanding to 68 schools in 28 districts in 2009-10, and serving students in 63 schools in 2016-17. The program is based on the following theory of action:

1. Students from underserved student populations do not receive enough information from parents or school counselors to help them in planning for college and career options.
2. This information can be effectively provided to students at a time and place identified by the individual schools through a preplanned curriculum, which includes interactive sessions and activities on the earnings advantages of graduating from college, educational requirements of different careers, exploration of college choices, campus visits, and the availability of financial aid.
3. Providing this information in middle school, as opposed to waiting until high school, will improve a variety of high school and postsecondary outcomes, including high school course-taking and college enrollment.
4. Students receiving such a curriculum (i.e., direct program participants) can also be trained to inform and influence their peers (i.e., indirect program participants), thus increasing college-going rates by their classmates who did not participate in the program. The program refers to its direct participants as "mentors" in order to emphasize this role.

Since its inception, the Career & College Clubs curriculum has evolved over time to increase its

emphasis on training students to teach their peers. In the first year, one of the ten training sessions in the program's curriculum encouraged students to make plans to "Give Back," which included a variety of community service and activism options; the curriculum, however, did not explicitly emphasize that the direct participants would convey their career and college knowledge to their peers (Career & College Clubs, 2008). In the program's second year, the year in which the current study is focused, the "Give Back" session was changed to have direct participants (i.e., "mentors") develop an activity to teach their classmates about what they had learned (Career & College Clubs, 2009). In subsequent years, the curriculum has been rewritten to incorporate peer sharing after each training session. If implemented well, peer outreach can be an especially important part of expanding a program's reach in schools where the number of students served directly by the program is relatively small. Indeed, the extent to which the program has a general impact on the school is based to a large degree on the strength of these peer effects.

Literature Review

Importance of Intervention in Middle School

The middle school years are an important time to start helping students shape their academic and career plans. At this age, students begin to make more independent decisions, and more decision making is expected of them (Caskey & Anfara, 2014). These decisions by middle school students can include whether to attend and work hard in school. Especially in high-poverty schools, attendance and grades in middle school are strong predictors of whether students will graduate from high school, without which their hopes for college and career are greatly diminished (Balfanz, 2009). College and career awareness programs for low-income students in middle school may be hypothesized to help students develop long-term goals, in turn influencing the decisions they make about course-taking and academic effort in middle and early high school (Trusty, Niles & Carney, 2005). In turn, these decisions are likely to affect their choices after high school (Eccles, Vida, & Barber, 2004; Roderick, Nagaoka, & Coca, 2009). In a similar vein, programs that provide information about careers that match students' interests can also help those students see the connection between their current level of effort and their future prospects (Schaefer & Rivera, 2012).

Previous Reports on Career & College Clubs

This study is a follow-up to two previous reports that sought evidence of program impact by comparing Career & College Clubs direct participants with different groups of nonparticipants. The first report (Sconing, 2013) compared 1,055 ACT® Explore®-tested 8th-grade program direct participants from 47 schools in the 2009-10 through 2011-12 school years with two other student populations—all Explore-tested students in the participants' schools in the same year (14,235 students, including the direct participants as a subset)—and a national population of 354,679 Explore-tested at-risk students, also matched to the direct participants by school year. These three student groups were compared on three outcomes: the percentage of students on target[1] to meet ACT's College Readiness Benchmarks in each subject area; the percentage of students who planned to take at least four years of English and three years each of mathematics, social science, and natural science in high school; and the percentage of students whose postsecondary plans included attending a four-year college. At-risk students were defined as those who, when registering to take Explore, identified themselves as Hispanic, Black Non-Hispanic, or Native American, or indicated that neither parent has any education beyond high school. Information on students' course-taking and college-going plans was also self-reported by students when they registered for Explore.

Based on the percentage of students meeting the Benchmarks on Explore, the Career & College Clubs direct participants in the study were substantially better prepared than the general student population in their schools but similarly prepared with the national population of at-risk students. Specifically, 49%, 23%, 32%, and 8% of the program's direct participants met the Benchmarks in English, mathematics, reading, and science, respectively, compared to 37%, 14%, 18%, and 5% for the overall student population in their schools, and 50%, 20%, 29%, and 9% of at-risk students, nationally. Since the program's direct participants were included within their school totals, a within-school comparison between these participants and those peers not directly served by the program would have favored the direct participants even more.

Career & College Clubs direct participants exceeded students in the two comparison populations in the percentage of students planning to take an academic core curriculum in high school. In particular, 62%, 75%,

56%, and 65% of the program's direct participants planned to take such a curriculum in English, mathematics, natural science, and social science subjects, respectively, versus 33%, 49%, 32%, and 40% of the overall Explore-tested population in their schools, and 43%, 54%, 44%, and 49% of at-risk students nationally. Eighty percent of the program's direct participants had plans to attend a four-year college after high school, versus 61% of the overall population in their schools and 64% of at-risk students, nationally.

Although the overall findings of this report were promising, the design of the study had several limitations that did not make it possible to disentangle how much of these differences were due to program effects versus differences in the characteristics of the students selected to participate directly in the Career & College Clubs program. First, at some schools, Explore is administered during the fall of the students' 8th-grade year. At these schools, outcomes data such as Benchmark attainment, high school coursework plans, and college degree expectations are collected too early to likely be shaped by the Career & College Clubs program, suggesting that they are more likely measures of pre-existing differences between the program's direct participants and other students. Second, the analytic approach was limited to univariate comparisons of the outcomes among the three student groups, which were not independent of each other. Given that the groups were not independent, regression analysis could not be used to control for observed student characteristics. Perhaps more importantly, the analysis could not control for differences in unobserved student characteristics between groups due to the non-random assignment of students to the program. Thus, a simple comparison of program and non-program students cannot disentangle program effects from selection effects.

The second report (Cruce, Mattern & Sconing, 2015) remedied some of the weaknesses in the first report by using multivariate regression to control for remaining differences between the students in observed covariates. This report compared the 2014-15 college enrollment rates of 111 students who participated directly in the program as 8th graders in nine schools in the 2009-10 school year with those of 968 at-risk 8th-grade students in non-program schools. This report found that for a hypothetical average student (one for whom all the variables in the model other than Career & College Clubs participation were at their mean values), the predicted probability of enrolling in college was 62% for a direct participant in the program versus 46% for a similar non-participant with average characteristics. Although in this study the authors attempted to statistically control for differences among the two groups using typical observed characteristics of the students and their schools, adding measures of currently unobserved characteristics (such as student motivation) and matching the two groups on the selection criteria used for the program would have strengthened the evidence for the impact of the program participation on college enrollment.

Where past research on Career & College Clubs has placed emphasis on understanding the impact of the program on those students who are *directly* involved with the curriculum, the current study considers the program's broader impact on *all* students in the grade level in which the program was offered. By design, the Career & College Clubs direct participants are meant to take back the lessons they learn through the program to share them more widely with their peers. This peer mentoring is a key aspect of the theory of action for the program, and research is necessary to better understand the potential impact the program has at the school level. By focusing on all students in the grade level, our study estimates the total effect (i.e., the direct effect and the spillover effect) of Career & College Clubs. While this particular element of our study design addresses a limitation of prior research by minimizing the potential bias that can be introduced by students self-selecting into the role of direct participants in the program, it is important to acknowledge that it does so by asking a fundamentally different—albeit important—question than was asked in the prior two studies that focused on the effects of direct participation.

Methods

Study Design

One of the major aspects of the theory of action guiding the Career & College Clubs program is that the peers of the direct participants should benefit indirectly from exposure to the objectives and content of the program through both formal and informal interactions with the direct participants during the school year. The causal question of interest in this study is whether or not *all* of the students exposed to the program in a school and grade level—i.e., the direct participants and their grade-level peers—enrolled in college at a higher rate than they would have in absence of that treatment in their school. This intention-to-treat (ITT) approach reduces selection bias by including every student who was eligible to receive the treatment either directly or indirectly regardless of whether or not that student complied with

the treatment, received a deviation in the treatment, or withdrew from the treatment (Sheiner & Rubin, 1995).

This study focuses on one of the earliest implementation years of the Career & College Clubs program, 2009-10. Although program staff used surveys to collect data from direct participants, we do not have any information that can help us to determine or even estimate the extent to which exposure to the program through the direct participants varied across peers within a school or varied in the aggregate between schools. The results of our ITT analysis thus provide evidence on the general impact of the *presence* of Career & College Clubs in the middle schools as opposed to the differential impact of the program on the students who had different levels of exposure to the treatment.

To address the causal question of whether the presence of the Career & College Clubs program in the school had an impact on the college-going behavior of students at that school, we would want to compare this outcome to that from a counterfactual scenario whereby we observe the college-going behavior of these same students in absence of any exposure to the program. Because this counterfactual is hypothetical only—as students cannot both receive and not receive exposure to the treatment—we use a comparison group to simulate the counterfactual scenario for comparison to the treatment scenario. The observed difference in the average outcome between Career & College Clubs direct and indirect participants, on the one hand, and non-participants on the other hand is equal to the average effect of the program on the direct and indirect participants plus some degree of selection bias. If selection bias is negative, Career & College Clubs participants would have fared worse than non-participants in the absence of the program; this means that the observed difference in the outcome between the two groups underestimates the effect of the program. Conversely, if selection bias is positive, participants would have fared better than non-participants in absence of the program; this means that the observed difference in the outcome between the two groups overestimates the effect of the program. If selection bias is zero, participants would have fared the same as non-participants in absence of the program, and the observed difference is thus equivalent to the effect of the program on its participants.

Regardless of whether it results in an underestimation or an overestimation of the treatment effect, selection bias is present in the observed difference between participants and non-participants when assignment to the treatment is not independent of the outcome. One way to ensure independence between treatment assignment and the outcome—and thus solve the selection bias problem—is to randomly assign units to the treatment. This type of assignment found in a randomized controlled trial provides some assurance that the control and treatment groups are balanced—meaning that the characteristics of these two groups are equivalent—prior to the treatment. Schools participating in the Career & College Clubs, however, were not selected at random. Instead, schools were selected into the program because of the potential outcome (whether realized or not) associated with their students' participation in the program. Thus, our observed differences in outcomes between participants and non-participants will be subject to some degree of selection bias, even with the use of an intention-to-treat model. Since students and schools were not randomly assigned to the program, a goal of our study is to create a research design that best approximates a randomized controlled trial in order to achieve equivalent groups between participants and nonparticipants.

To create a counterfactual for our treatment group, we use inverse propensity weighting of the control group to balance the treatment and control groups on the selection criteria for the Career & College Clubs program as well as on additional covariates of college enrollment. In conversations with the Career & College Clubs program administrative staff, we learned that selection during the early years of the program was based on the school's location near program offices and its concentration of low-income students. To match on location, we limited the targeted sample for the control group to those schools located in the same school districts as Career & College Clubs schools. To achieve balance on the low-income selection criteria, we used the percentage of students receiving free or reduced price lunch in our selection model. In addition to the specific selection criteria for the Career & College Clubs program, we used other important covariates of college enrollment as suggested by past empirical studies. These covariates include students' prior academic achievement (i.e., English and mathematics subject test scores), parents' education levels, students' race/ethnicity, students' best language (e.g., English, other language), students' participation in an outreach program (e.g., GEAR UP, TRIO), and other characteristics of the students' school environment (i.e., percent underrepresented minority, student-teacher ratio, and Title 1 status).

To compute the inverse propensity weights, we first estimated a logit model predicting selection into the sample using the selection criteria and other covariates known to predict college enrollment. We then used the results of this model to estimate for students in either group the propensity of being in a Career & College Clubs school. After examining the distribution of propensities and determining that none were too extreme, we calculated the inverse propensity weights that would provide the average treatment effect on the treated (i.e., ATT) such that the weight for the treatment group is equal to 1 and the weight for the control group is equal to the odds of being in the treatment group (i.e., p/(1-p)).

Data and Samples

Data for this study come from four sources. The first source is a data file that the Career & College Clubs administrative staff provided to the researchers in order to identify the treatment population for this study. This data file contains a list of the National Center for Education Statistics (NCES) school IDs and the respective grade levels and school years in which the Career & College Clubs program operated. The second source is the Explore data file for the 2009-10 administration year. This data file contains self-reported information about students' demographic, socioeconomic, and educational backgrounds, and students' scores on a battery of standardized assessments in the subject areas of English, mathematics, reading, and science. The third data source is the NCES Common Core of Data (CCD) data file for the 2009-10 school year. This data file contains such information as school-level and grade-level enrollment counts overall and by race/ethnicity, school-level counts of students receiving free or reduced price lunch, and other school identifiers (e.g., charter school status and Title I status). The fourth data source is a matched-student data file from the National Student Clearinghouse. This file contains the 2014-15, 2015-16, and 2016-17 college enrollment status for all students in the study.

To help identify the treatment group, we used data provided by the Career & College Clubs administrative staff. During the first three years of the program—2008-09, 2009-10, and 2010-11—the Career & College Clubs program was present in 73 schools located in 29 school districts in California. These schools can be classified into 11 discrete categories by the cohorts and grade levels in which the program was administered (see Table 1). This study focuses on 8th graders attending one of 59 schools in which the Career & College Clubs program was administered for the first-time as a single-year intervention during the 2009-10 school year.

There are several advantages to limiting our study to this targeted population of schools and students. First, although some of the targeted schools for this study offered a 7th grade one-year intervention or a 7th and 8th grade two-year intervention, the first-time, single-year intervention that was offered to 8th graders in 59 schools during the 2009-10 school year was the most prevalent implementation of the Career & College Clubs program across the first three years of the program's existence. As such, this administration type is the most representative of the program during its early years. Second, by focusing only on schools that were implementing the Career & College Clubs program for the first time, we may assume a higher degree of consistency across the schools in the implementation of the program given that none of these schools had undergone a previous administration that might alter their implementation strategy. Third, by focusing only on schools that were implementing the program during the same school year, we may assume that the program curriculum—which was reportedly in flux over the first few administration years of the program—was comparable (as intended, not necessarily as delivered) across schools. Finally, by focusing on schools that were administering a program to 8th graders, we can use preexisting data from an 8th-grade assessment (i.e., Explore) to control for other covariates related to our outcome of interest. Of the 59 Career & College Clubs schools targeted for this study, we identified 27 schools as having administered Explore to 8th graders during the 2009-10 school year.

Table 1. Career & College Clubs Subcategories

Description	School N
2009 8th grade cohort, 8th grade intervention	1
2009 8th grade cohort, 8th grade intervention; 2010 8th grade cohort, 7th grade intervention	4
2009 8th grade cohort, 8th grade intervention; 2010 8th grade cohort, 7th-8th grade intervention; 2011 8th grade cohort, 7th-8th grade intervention	2
2009 8th grade cohort, 8th grade intervention; 2010 8th grade cohort, 7th-8th grade intervention; 2011 8th grade cohort, 8th grade intervention	1
2010 8th grade cohort, 8th grade intervention[a]	15
2010 8th grade cohort, 8th grade intervention; 2011 8th grade cohort, 7th grade intervention[a]	23
2010 8th grade cohort, 8th grade intervention; 2011 8th grade cohort, 7th-8th grade intervention[a]	16
2010 8th grade cohort, 8th grade intervention; 2011 8th grade cohort, 8th grade intervention[a]	5
2011 8th grade cohort, 7th grade intervention	3
2011 8th grade cohort, 7th-8th grade intervention	1
2011 grade cohort, 8th grade intervention	2

[a] Focus of current study

We dropped seven of these schools from the study, however, as the small percentage of tested 8th graders—at 40% or lower—at these schools suggested that they did not attempt a grade-level census administration of Explore. Among the other 20 schools, the percentage of 8th graders tested with Explore ranged from 81% to 100%, with all but two schools testing 90% or more of their 8th-grade cohort. Finally, we eliminated one additional school from the study, as data from NCES identified it as a small alternative school that was an outlier among the larger, non-alternative schools that were offering the Career & College Clubs program. The final sample for the treatment group was 7,504 8th graders attending 19 schools within two large urban California school districts. All of the students in these schools were administered Explore within a late-fall/early-winter test administration window.

To create the control group, we first limited our population of non-program schools to the 212 schools serving 8th graders located within the same two large urban districts in California. By focusing on these two school districts, we can assume that students in the treatment and control group attended schools that share the same governance and taxation structures, curriculum, and district policies. Of these non-program schools, we identified 90 schools as having administered Explore to 8th graders during the 2009-10 school year. We retained 85 of these schools, as the percentage of 8th graders tested with Explore was sufficiently high, ranging from 86% to 100%, with all but two schools testing 90% or more of their 8th grade cohort. We eliminated 25 additional non-program schools from the study, however, because data from NCES identified them as either a charter school, an alternative school, or a school that also serves elementary grades (whereas Career & College Clubs program schools are all middle schools), or because the schools administered Explore outside of the late-fall/early-winter test administration window. The final sample for the control group was 29,350 8th graders attending 60 non-program schools within the two districts.

Outcomes and Analysis

Using matched enrollment data from the National Student Clearinghouse, we created two outcome measures for our study. The first measure is an indicator of whether the student enrolled in college during the 2014-15 school year, which is the year that would directly follow high school graduation for this cohort of students. To be less restrictive, the second measure of our outcome is an indicator of whether the student enrolled in college at any point during the three academic years (2014-15, 2015-16, or 2016-17) that followed high school graduation.

Given the dichotomous nature of our outcome variables, we estimated a logit regression model to examine the impact of Career & College Clubs program participation on college enrollment. We estimated two models for each our outcomes of interest: The first model includes only an indicator of the students' participation in the program, and the second model includes that indicator variable plus the same set of covariates that are used in the model estimating students' selection into the treatment group. The use of this multivariate model in addition to a simple chi-square test of the college

enrollment rate between the two balanced groups allows us to control for any observable differences in the treatment and control groups that remain after applying the inverse propensity weighting.

Results

The first two columns in Table 2 (labeled “Treatment Group” and “Control Group Unweighted”) provide the unweighted means and standard errors for the Career & College Clubs program selection criteria and other covariates used in our selection and outcomes models. As is evident from the table, there are some notable differences in the unweighted means of these two groups. For example, compared to the unweighted control group, the Career & College Clubs participants had a significantly higher share of African American and Asian students and a lower share of Hispanic and White students. The treatment group also had a higher percentage of students who indicated that a language other than English was the language that they knew best, and the treatment group had lower average test scores for the Explore English test. There were also significant differences in the characteristics of the schools attended by the treatment and control groups. For example, a significantly smaller share of students in the treatment group attended a Title I school and were in District A (as compared to District B).

Table 3 provides the results of the logit model predicting membership in the sample of 7,504 students in the 19 Career & College Clubs schools, as opposed to the 29,350 sampled students in the 60 non-program schools. As suggested by the previously mentioned univariate differences between the treatment and control groups, student characteristics such as race, students’ self-report of the language they know best, and their Explore English test scores, and all school characteristics were among the statistically significant predictors in the multivariate model. The results of this model were used to create the inverse propensity weights used in our outcomes models. The last column in Table 2 (labeled “Control Group Weighted (ATT)”) provides the means and standard errors for the control group that have been weighted based on the results of the logit model predicting membership in the treatment group. After weighting the control group, the two samples are better balanced as evidenced by smaller differences between the treatment and control group on most of the selection criteria and other covariates.

Also included in Table 2 are the means and standard errors for the two outcomes of interest in this study. Among students who had some exposure to Career & College Clubs in 8th grade, 48.0% enrolled in college in the year just following high school, and 55.2% enrolled in college at any point in the three years following high school. When unweighted, the outcomes for the control group are 45.2% having enrolled in the year just following high school and 52.7% having enrolled in the three years following high school. Once weighted to provide greater balance between the two groups, the two enrollment rates for the control group increase to 47.5% and 54.6%, respectively. These increases in the control group’s enrollment rates that result from use of the inverse propensity weights suggest that the selection bias for the observed difference in the unweighted outcomes between the treatment and control groups would be positive. In other words, Career & College Clubs participants would likely have fared better than non-participants in absence of the program, and thus the observed difference in the unweighted enrollment rates between the treatment and control groups would likely have overestimated the effect of the program.

To provide a better estimate of the program’s effect, we estimated two logit models for each enrollment outcome using the inverse propensity weights (see Table 4). Regardless of the way in which college enrollment is operationalized and regardless of whether we use a univariate or multivariate model, we find no statistically significant differences in the estimated enrollment rates between the Career & College Clubs group and the control group after using inverse propensity weights to account for selection bias.

Table 2. Descriptive Statistics for Treatment Group and Control Group Before and After Inverse Propensity Weighting

	Treatment Group		Control Group Unweighted					Control Group Weighted (ATT)				
Variable	Mean	SE	Mean	SE	Δ	t	p > |t|	Mean	SE	Δ	t	p > |t|
Father's education[a]												
Less than high school	0.148	0.004	0.156	0.002	-0.009	-1.85	0.065	0.147	0.003	0.000	0.06	0.950
High school	0.099	0.003	0.096	0.002	0.002	0.63	0.526	0.093	0.002	0.006	1.47	0.143
Technical training	0.031	0.002	0.028	0.001	0.003	1.46	0.144	0.031	0.002	0.001	0.35	0.726
Some college	0.036	0.002	0.033	0.001	0.003	1.34	0.179	0.036	0.002	0.000	0.10	0.921
2-year degree	0.025	0.002	0.023	0.001	0.001	0.72	0.470	0.025	0.001	0.000	-0.05	0.960
4-year degree	0.043	0.002	0.042	0.001	0.001	0.37	0.713	0.044	0.002	0.000	-0.13	0.894
Graduate degree	0.031	0.002	0.031	0.001	-0.001	-0.29	0.769	0.030	0.002	0.000	0.08	0.936
Missing	0.588	0.006	0.589	0.003	-0.002	-0.29	0.775	0.595	0.004	-0.007	-1.03	0.301
Mother's education[a]												
Less than high school	0.182	0.004	0.191	0.002	-0.009	-1.70	0.090	0.182	0.003	0.000	-0.06	0.948
High school	0.116	0.004	0.114	0.002	0.002	0.52	0.605	0.110	0.003	0.006	1.41	0.159
Technical training	0.016	0.001	0.015	0.001	0.002	1.07	0.285	0.016	0.001	0.000	-0.07	0.947
Some college	0.051	0.003	0.046	0.001	0.004	1.62	0.105	0.049	0.002	0.001	0.39	0.695
2-year degree	0.035	0.002	0.036	0.001	-0.001	-0.53	0.598	0.034	0.002	0.000	0.07	0.940
4-year degree	0.053	0.003	0.050	0.001	0.002	0.87	0.386	0.053	0.002	-0.001	-0.23	0.819
Graduate degree	0.029	0.002	0.034	0.001	-0.005	-2.21	0.027	0.030	0.001	0.000	-0.09	0.931
Missing	0.518	0.006	0.514	0.003	0.004	0.66	0.507	0.525	0.004	-0.006	-0.89	0.375
Race/ethnicity[a]												
African American	0.111	0.004	0.095	0.002	0.016	4.23	0.000	0.113	0.003	-0.002	-0.43	0.666
White	0.067	0.003	0.082	0.002	-0.015	-4.23	0.000	0.061	0.002	0.006	1.72	0.086
Hispanic	0.604	0.006	0.697	0.003	-0.093	-15.51	0.000	0.603	0.004	0.001	0.11	0.910
Asian	0.163	0.004	0.099	0.002	0.064	15.65	0.000	0.159	0.004	0.004	0.64	0.524
Other race	0.019	0.002	0.012	0.001	0.007	4.75	0.000	0.018	0.001	0.002	0.90	0.367
No race reported	0.036	0.002	0.015	0.001	0.021	11.98	0.000	0.046	0.003	-0.010	-2.81	0.005

Table 2. (Continued)

Variable	Treatment Group		Control Group Unweighted					Control Group Weighted				
	Mean	SE	Mean	SE	Δ	t	p > |t|	Mean	SE	Δ	t	p > |t|
Best language spoken[a]												
English	0.512	0.006	0.504	0.003	0.008	1.24	0.214	0.502	0.004	0.010	1.46	0.144
Other	0.078	0.003	0.048	0.001	0.031	10.51	0.000	0.074	0.003	0.004	1.02	0.310
English and other	0.261	0.005	0.289	0.003	-0.028	-4.72	0.000	0.257	0.003	0.005	0.77	0.442
Missing	0.148	0.004	0.159	0.002	-0.011	-2.36	0.018	0.168	0.003	-0.019	-3.72	0.000
Self-reported outreach program[a]												
Yes	0.137	0.004	0.104	0.002	0.032	8.00	0.000	0.124	0.003	0.012	2.44	0.015
ACT Explore scores[a]												
English	12.181	0.044	12.313	0.023	-0.133	-2.63	0.009	12.242	0.036	-0.061	-1.07	0.284
Math	12.946	0.049	12.950	0.024	-0.003	-0.06	0.951	12.977	0.040	-0.031	-0.49	0.626
School characteristics[b]												
% underrepresented[c]	0.759	0.004	0.816	0.001	-0.057	-19.32	0.000	0.759	0.003	0.000	-0.03	0.979
% receiving FRL[d]	0.761	0.002	0.768	0.001	-0.007	-3.16	0.002	0.756	0.002	0.006	2.01	0.044
Student-teacher ratio	20.795	0.043	21.581	0.020	-0.786	-17.21	0.000	20.745	0.033	0.050	0.92	0.357
Title I school	0.840	0.004	0.943	0.001	-0.102	-29.75	0.000	0.810	0.005	0.030	4.60	0.000
District A[e]	0.798	0.005	0.950	0.001	-0.152	-44.15	0.000	0.771	0.005	0.027	3.88	0.000
Outcomes[f,g]												
Enrolled directly	0.480	0.006	0.452	0.003				0.475	0.004			
Enrolled anytime	0.552	0.006	0.527	0.003				0.546	0.004			

a. Source: ACT Explore

b. Source: NCES Common Core of Data

c. Underrepresented minority = African American, Hispanic, or American Indian

d. FRL = Free or reduced-price lunch

e. Districts are not named in this study

f. Source: National Student Clearinghouse

g. Enrollment measures not used in selection model

Table 3. Parameter Estimates for Logit Model Predicting Participation in Career & College Clubs[a]

Predictor	Coeff	Std Err	ChiSq	Pr > ChiSq
Father education: < high school	0.005	0.049	0.090	0.926
Father education: high school	0.033	0.054	0.610	0.543
Father education: technical training	0.110	0.083	1.320	0.187
Father education: some college	0.064	0.080	0.800	0.422
Father education: 2-year degree	0.044	0.094	0.460	0.643
Father education: 4-year degree	0.013	0.078	0.170	0.863
Father education: graduate degree	0.068	0.091	0.740	0.458
Mother education: < high school	-0.066	0.047	-1.380	0.167
Mother education: high school	-0.041	0.052	-0.780	0.436
Mother education: technical training	0.010	0.113	0.090	0.927
Mother education: some college	0.062	0.070	0.880	0.378
Mother education: 2-year degree	-0.032	0.081	-0.390	0.696
Mother education: 4-year degree	-0.036	0.074	-0.490	0.621
Mother education: graduate degree	-0.251	0.092	-2.710	0.007
Race: African American	0.325	0.072	4.520	0.000
Race: Hispanic	0.030	0.063	0.470	0.635
Race: Asian	0.294	0.069	4.270	0.000
Race: Other race	0.207	0.121	1.710	0.087
Race: No race reported	0.737	0.101	7.270	0.000
Best language: English	0.317	0.044	7.240	0.000
Best language: other	0.582	0.066	8.810	0.000
Best language: English & other	0.231	0.047	4.890	0.000
Self-reported outreach program	-0.043	0.043	-0.980	0.325
Explore English score	-0.018	0.005	-3.560	0.000
Explore math score	-0.004	0.005	-0.960	0.339
Percent underrepresented minority	1.130	0.156	7.250	0.000
Percent free or reduced-price lunch	-16.419	0.837	-19.610	0.000
Percent free or reduced-price lunch squared	11.344	0.562	20.180	0.000
Student-teacher ratio	-0.051	0.007	-6.970	0.000
Title I school	-0.381	0.068	-5.580	0.000
District A	-1.934	0.098	-19.800	0.000
Intercept	6.351	0.335	18.940	0.000

[a] Log likelihood = -17313.1; Likelihood ratio = 2623.77, DF = 31, prob > chisq = 0.000

Table 4. Parameter Estimates for Logit Models Predicting College Enrollment

	Enrolled Directly After High School[a]				Enrolled Any Time After High School[b]			
Predictor	**Coeff**	**Std Err**	**ChiSq**	**Pr > ChiSq**	**Coeff**	**Std Err**	**ChiSq**	**Pr > ChiSq**
Model 1								
Career & College Clubs	0.021	0.029	0.740	0.460	0.023	0.028	0.800	0.422
Intercept	-0.099	0.017	-5.950	0.000	0.184	0.016	11.220	0.000
Model 2								
Career & College Clubs	0.036	0.030	1.210	0.227	0.036	0.029	1.240	0.215
Father education: < high school	0.137	0.054	2.540	0.011	0.077	0.061	1.270	0.204
Father education: high school	0.061	0.061	1.010	0.313	-0.025	0.097	-0.260	0.798
Father education: technical training	-0.031	0.098	-0.320	0.752	0.169	0.092	1.830	0.067
Father education: some college	0.158	0.093	1.690	0.091	0.132	0.105	1.260	0.208
Father education: 2-year degree	0.028	0.103	0.270	0.786	0.173	0.097	1.790	0.074
Father education: 4-year degree	0.130	0.094	1.380	0.166	0.262	0.103	2.540	0.011
Father education: graduate degree	0.257	0.101	2.540	0.011	-0.153	0.052	-2.970	0.003
Mother education: < high school	-0.156	0.053	-2.960	0.003	-0.023	0.057	-0.410	0.684
Mother education: high school	-0.003	0.058	-0.050	0.962	-0.147	0.136	-1.080	0.280
Mother education: technical training	-0.149	0.142	-1.050	0.295	-0.006	0.079	-0.070	0.944
Mother education: some college	-0.080	0.080	-1.010	0.314	-0.033	0.090	-0.370	0.711
Mother education: 2-year degree	-0.002	0.089	-0.020	0.984	0.099	0.087	1.140	0.255
Mother education: 4-year degree	0.132	0.086	1.540	0.124	0.069	0.110	0.630	0.529
Mother education: graduate degree	-0.106	0.109	-0.980	0.329	0.049	0.083	0.590	0.553
Race: African American	0.022	0.081	0.280	0.782	-0.081	0.074	-1.100	0.272
Race: Hispanic	-0.063	0.072	-0.880	0.380	0.225	0.085	2.660	0.008
Race: Asian	0.327	0.082	3.990	0.000	-0.073	0.132	-0.550	0.582
Race: Other race	-0.081	0.130	-0.630	0.531	-0.330	0.120	-2.760	0.006
Race: No race reported	-0.360	0.123	-2.920	0.004	0.108	0.048	2.270	0.023
Best language: English	0.060	0.049	1.240	0.214	-0.159	0.076	-2.100	0.035
Best language: other	-0.208	0.079	-2.640	0.008	0.168	0.051	3.290	0.001

Table 4. (Continued)

Predictor	Enrolled Directly After High School[a]				Enrolled Any Time After High School[b]			
	Coeff	Std Err	ChiSq	Pr > ChiSq	Coeff	Std Err	ChiSq	Pr > ChiSq
Best language: English & other	0.138	0.052	2.650	0.008	-0.106	0.050	-2.140	0.032
Self-reported outreach program	-0.022	0.050	-0.440	0.657	0.079	0.006	13.660	0.000
Explore English score	0.081	0.006	13.800	0.000	0.063	0.005	12.270	0.000
Explore math score	0.072	0.005	13.530	0.000	-0.174	0.173	-1.010	0.313
Percent underrepresented minority	-0.227	0.175	-1.300	0.194	-0.180	0.173	-1.040	0.297
Percent free or reduced-price lunch	-0.078	0.173	-0.450	0.652	0.006	0.008	0.720	0.470
Student-teacher ratio	0.008	0.008	0.970	0.331	-0.142	0.071	-2.000	0.046
Title I school	-0.167	0.069	-2.420	0.016	-0.424	0.101	-4.220	0.000
District A	-0.387	0.101	-3.820	0.000	-1.032	0.263	-3.930	0.000
Intercept	-1.559	0.263	-5.920	0.000	0.106	0.053	2.010	0.045

a. Model 1 log likelihood = -10501; Model 1 likelihood ratio = 0.55, DF = 1, prob > chisq = 0.4596;
Model 2 log likelihood = -9454.1; Model 2 likelihood ratio = 1933.48, DF = 31, prob > chisq = 0.000

b. Model 1 log likelihood = -10443.9; Model 1 likelihood ratio = 0.64, DF = 1, prob > chisq = 0.4222;
Model 2 log likelihood = -9529.9; Model 2 likelihood ratio = 1737.77, DF = 31, prob > chisq = 0.000

Discussion

In this study, we used 2014-15 enrollment data from the National Student Clearinghouse to compare the college-going rates of 8th graders in schools with the Career & College Clubs program in the 2009-10 school year with those of a comparison group of 8th-grade students in non-program schools in the same districts that year. After applying inverse propensity weights to make the program and comparison samples comparable on the program selection criteria and other observable measures, we did not find a statistically significant difference between the college enrollment rates of students in program schools and those of students in non-program schools. This study, which examined the overall impact of the Career & College Clubs program on all 8th graders in participating schools in the program's second year, should serve only as a baseline for future research to assess the impact of the program as it continues to mature.

Limitations

There are several possible reasons why we found no effect for the program. Some of these possible reasons are based on study limitations. Other possible reasons are based on aspects of the program during it earliest years of implementation. In truth, we cannot disentangle these two sets of reasons, nor can we know if the finding of no effect is true or is due to one of these other possible reasons.

An important limitation of this study is that it is based on pre-existing historic data that were not originally collected for the purposes of evaluating the Career & College Clubs program. As a result of this limitation, not all program schools and students were included in our study. As previously mentioned, the program was located within 68 schools across 28 districts in 2009-10. Given the non-concentrated adoption of Explore as an 8th-grade assessment in California (and other constraints of our research design), we were able to focus on only 19 of these program schools located in two districts. We do not know whether these 19 schools were a representative sample of the population of program schools with regard to the fidelity of their program implementation. Further, it is also possible that our reliance on Explore as a data source could moderate the effect of the Career & College Clubs program. In addition to the subject tests, Explore provides students and schools with career and educational navigation and planning components that align with the goals of the Career & College Clubs program, and these components could have been used by students and schools within the control group.

A second study limitation that may provide an explanation for our finding of no effect involves our inability to track these students into high school. One impact of this limitation is the likelihood of program "fade-out." In the absence of a follow-through program in the high schools that the students attended, any effect of the program may have been undone by the lack of reinforcement during the high school years. This explanation is speculative, as we have no information on what kind of follow-up existed in the high schools. Another impact of this limitation is the likelihood of contamination. As these treatment and control schools are in the same district, it is possible that feeder patterns between middle schools and high schools resulted in the mixing of treated and untreated students, potentially diluting the program effect through informal student exchanges during the high school years.

Other possible reasons why we found no effect for the program are due to particular aspects of the Career & College Clubs program being in only its second year of implementation. First, as mentioned in the introduction, the program's curriculum was new and underwent significant revisions between the first and second implementation years. The peer-mentoring aspect of the program, on which this study's focus on the general effect of the program on the school rests, was only in its first year in 2009-10, and it was not as extensive as it has been in more recent years.

Another potential programmatic explanation for our finding of no effect is the small number of direct participants in 2009-10 relative to the total number of 8th-grade students in their schools. We estimate that only about 3% of the students in the schools in the study were directly served by the program, with these percentages for individual schools ranging from 0.1% to 9.1%.[2] If it is the case that the program mainly affected the direct participants but not their peers, then the program's overall average effect on the entire grade would be diluted by the absence of a strong peer effect. Looking at all students in the grade is likely to *under*estimate program impacts on direct participants alone, in contrast with previous studies which may have *over*estimated the program impact on the same direct participants by being unable to fully control for selection bias. Through this particular study design, which incorporates a control group, we were not able to disentangle the direct and spillover effects of the

program without reintroducing potential selection bias to our estimates of program impact.

We did, however, attempt to examine post hoc whether there was sufficient variation in the postsecondary enrollment outcomes between our 19 Career & College Clubs schools, and if this between-school variation could be explained by differences across the schools in the share of students in the grade level who were direct participants in the program. The hypothesis driving this analysis is that schools with a larger share of direct participants may have larger spillover effects than schools with a smaller share of direct participants. To examine the potential variability across middle school sites in the effectiveness of Career & College Clubs on the college enrollment of students, we estimated several multilevel models with random intercepts for the 19 Career & College Clubs middle schools in our study. As a baseline, we estimated an intercept-only model for each college enrollment outcome in our study. For both outcomes, the variance in the unconditional school means is statistically significant. The interclass correlation (ICC) for our intercept-model only was 0.10 for college enrollment directly after high school and 0.09 for our broader college enrollment outcome. This means that roughly 9-10% of the total variance in our college enrollment measures is attributed to differences among the 19 middle schools, whereas the other 90-91% of the variance is attributed to differences within the middle schools.

To the random intercept-only models we added fixed effects for the students' Explore English score and Explore math score in order to statistically control for the students' academic achievement. For both outcomes, both of these fixed effects were positive and statistically significant. The addition of these two fixed effects accounted for 56.3% and 55.1% of the between-school variance in our direct college enrollment and broader college enrollment outcomes, respectively. To this model, we added two additional fixed effects for the percentage of program mentors in 8th grade at the school and for the total enrollment size of the 8th grade at the school. In both models, both of these fixed effects were positive, but neither were statistically significantly different from zero, suggesting that the allocation of mentors at the school does little to explain the differences in college enrollment rates across the 19 middle school sites over and above the students' academic achievement level.

Future Directions

The study limitations mentioned in our discussion point the way to further research that could be conducted on this program in order to have a better means of determining its effectiveness. First, data should be collected on how the program is implemented in the schools—how many students attend each of the trainings, the extent to which teachers deliver or modify the curriculum recommended by the program, and the types of outreach students conduct with their peers. Second, short-term pre- and post-program outcome indicators should be collected not only from students in the program, but also from their peers to gauge the extent of the participants' influence on their peers' career and college plans and expectations. Third, data needs to be collected on high school program participation and outcomes for students in both program and non-program schools to gauge whether high schools appear to be: 1) reinforcing the effects of the program, 2) allowing those effects to fade out, or 3) compensating for those effects by providing extra interventions for students from non-program schools who, perhaps, show a greater need for academic and non-academic support. Research should be conducted with multiple student cohorts to make it possible to gauge the impact of the evolution of the program. Such an expanded data collection and research program would enable educators not only to get a better fix on the program's ultimate impact, but also to improve the program based on feedback from short-term indicators.

To the extent that our finding of no effect is based on aspects of the program during its earliest years of implementation, this discussion also points to reasons why the program may demonstrate greater effectiveness in future years. For example, the program is moving in the direction of a model that provides direct training to a higher percentage of students at each grade level. Even in the absence of training everyone, the program's curriculum has focused more extensively in recent years on training participants to inform and influence their peers. There is also an effort to extend the program into high schools to ensure students receive a continuum of intervention in grades 7 through 12. All of these changes could lead to higher measured program effects in future studies.

References

ACT. (2015). *The condition of college & career readiness 2015: Students from low-income families.* Iowa City, IA: ACT.

Avery, C., Howell, J. S., & Page, L. (2014). *A review of the role of college counseling, coaching, and mentoring on students' postsecondary outcomes.* New York, NY: The College Board.

Balfanz, R. (2009). *Putting middle grades students on the graduation path: A policy and practice brief.* Baltimore, MD: Everyone Graduates Center at Johns Hopkins University, Philadelphia Education Fund and National Middle School Association. Retrieved from https://www.amle.org/portals/0/pdf/articles/policy_brief_balfanz.pdf.

Career & College Clubs. (2008). *Career & College Clubs curriculum: A helpful guide to planning ahead.* Washington, DC: NCCEP.

Career & College Clubs. (2009). *Career & College Clubs curriculum: A helpful guide to planning ahead.* Washington, DC: NCCEP.

Caskey, M., & Anfara, V. A. (2014). *Developmental characteristics of young adolescents: Research summary*. Westerville, OH: Association for Middle Level Education. Retrieved from http://www.amle.org/BrowsebyTopic/WhatsNew/WNDet.aspx?ArtMID=888&ArticleID=455.

CLASP. (2015.) *Course, counselor, and teacher gaps: Addressing the college readiness challenge in high-poverty high schools.* Washington, DC: CLASP.

Cruce, T., Mattern, K., & Sconing, J. (2015). *More promising results: Evaluating the effectiveness of Career & College Clubs participation on college enrollment.* Iowa City, IA: ACT.

Eccles, J. S., Vida, M. N., & Barber, B. (2004). The relation of early adolescents' college plans and both academic ability and task-value beliefs to subsequent college enrollment. *Journal of Early Adolescence, 24*(4), 63-77. Retrieved from http://journals.sagepub.com/doi/pdf/10.1177/0272431603260919.

Lauff, E., & Ingels, S. J. (2013). *Education longitudinal study of 2002 (ELS:2002): A first look at 2002 high school sophomores 10 years later (NCES 2014-363)*. US Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from https://nces.ed.gov/pubs2014/2014363.pdf.

Parsad, B., Alexander, D., Farris, E., Hudson, L., & Greene, B. (2003). *High school guidance counseling (NCES 2003-015).* US Department of Education. Washington, DC: National Center for Education Statistics.

Roderick, M., Nagaoka, J., & Coca, V. (2009). College readiness for all: The challenge for urban high schools. *The Future of Children, 19*(1), 185-210. Retrieved from https://muse.jhu.edu/article/270378/pdf.

Schaefer, M. B., & Rivera, L. M. (2012). College and career readiness in the middle grades. *Middle Grades Research Journal, 7*(3), 51-66.

Sconing, J. (2013). *Promising results: Evaluating the effectiveness of Career & College Clubs.* Iowa City, IA: ACT.

Sheiner, L. B., & Rubin, D. B. (1995). Intention-to-treat analysis and the goals of clinical trials. *Clinical Pharmacology & Therapeutics, 57*(1), 6-15.

Trusty, J., Niles, S. G., & Carney, J. V. (2005). Education-career planning and middle school counselors. *Professional School Counseling, 9*(2), 136-143.

Notes

1. 8th-grade students are on target for meeting the College Readiness Benchmarks on the ACT test in 11th or 12th grade if they score at or above the Explore Benchmarks.
2. To create these estimates, we relied on the ratio of the number of direct participants who filled out surveys for C&CC program staff (the greater of the pre- and post-survey completion rates) to total 8th-grade enrollment in the Common Core of Data. These estimates agreed closely with numbers for the six schools where we had direct information on the number of program participants from Sconing (2013). Unfortunately, program staff did not have better estimates of direct participation in the program from the first few years of implementation.

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