More Promising Results
Evaluating the Effectiveness of Career & College Clubs Participation on College Enrollment

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June, 2015

ACT Working Paper Series
ACT working papers document preliminary research. The papers are intended to promote discussion and feedback before formal publication. The research does not necessarily reflect the views of ACT.
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Acknowledgements
Our thanks to Joseph Booth and Quentin Wilson from ALL Management Corporation and Michelle Croft and Kurt Burkum from ACT, Inc. for providing feedback on earlier drafts of this manuscript.
INTRODUCTION

In light of the large number of students dropping out of high school coupled more generally with the failure of many students to acquire the knowledge and skills needed to pursue a personally rewarding future (e.g., Mattern, Burrus, Camara, et. al, 2014), the Career & College Clubs (CCC) program was developed to assist middle school youth in becoming ready for a college education and a future career (http://careerandcollegeclubs.org/). The underlying model of the program includes three main components: early engagement, student-driven learning, and a fun and supportive learning environment. The philosophy of the program is that middle school is a critical time period for students in terms of defining their future and establishing strong personal skills such as ambition and leadership, and hence an emphasis on early engagement. Intervening at a later date may be too late in the process to have the needed effect on college and career success. For the second component, the program is student-driven in that peer-to-peer learning is employed thereby empowering the students to take ownership over their learning. Finally, a hallmark of the CCC program is providing a fun and supportive learning context. The program’s theory of action is that “if we engage at-risk middle school students in a peer-to-peer learning environment where they lead fun activities on the topics of career, college, and life skills; then these students will feel a greater sense of empowerment, as well as an intrinsic drive to plan for, and achieve, success in high school, college, and life” (http://careerandcollegeclubs.org/).

The program implementation works through a distributed system. Within a school, a coach (typically a counselor or a teacher) invites a subset of students to participate as CCC mentors. Coaches are advised to recruit students that are perceived as influencers in the school. That is, students are chosen based on their leadership qualities. Working with the coaches, CCC
mentors are provided a defined curriculum\(^1\) designed to increase awareness of the antecedents of career, college, and life success. The curriculum is divided into two areas: Exploration and Engagement. Sample Exploration topics include “Why Higher Education?”,” “Exploring Career Options”, and “Financial Literacy”. Sample Engagement topics include “College Admission Process” and “College Life”. The CCC mentors pass on what they have learned from the CCC curriculum to their peers. In this way, the goal is that the curriculum is infused throughout the school, and this, in turn, should lead to greater success for the student body as a whole.

Previous research conducted by ACT found that CCC mentors had more academically-challenging educational plans and intentions as compared to similar students attending a school that did not participate in the CCC program (College and Careers, 2013). Specifically, CCC mentors were more likely to indicate that they were planning to take a core curriculum\(^2\) in each subject area in high school, to earn a Bachelor’s degree or higher, and to have a career in science or technology.

Building on the previous study that examined intentions about postsecondary aspirations, this study tests whether CCC mentors are more likely to enroll in college directly after high school as compared to similar students attending a school that did not participate in the CCC program. Such findings would provide evidence for their proposed theory of action where participation as a mentor in the CCC program is linked to college success.

\(^1\) The CCC curriculum is s aligned with grades 6-8 Common Core State Standards and the American School Counselor Association National Standards for Students. In addition, the curriculum was developed to support student proficiency in 21st Century Skills. More details are provided at http://careerandcollegeclubs.org/about-the-program/.

\(^2\) The core curriculum ACT recommends consists of four years of English and three years each of mathematics, science, and social studies.
METHODS

Sample

The sample for this study is comprised of two groups. The treatment group consisted of students who were identified as CCC mentors while in 8th grade at one of nine different public middle schools in California (N=111). These schools tend to have higher proportions of students who are receiving either a free or reduced-price lunch and higher proportions of students who are African American, American Indian, or Hispanic as compared to the typical middle school. The control group consisted of a random sample of 8th graders from other comparable “underserved” public middle schools across the nation that did not implement the CCC program was drawn (N=968).

Data Sources

Data for this study were collected over two time periods: first during the 2009-10 school year when members of both the CCC group and control group were in 8th grade, and subsequently during the 2014-15 school year when these students could be enrolling in college directly after completing high school. The baseline data collection from the 2009-10 school year comes from ACT Explore®, an assessment of student achievement offered during late-middle school and early-high school that was a part of ACT’s college and career readiness system. College enrollment during the 2014-15 school year was determined by matching the records of these ACT Explore-tested students with enrollment records that colleges provided to the National Student Clearinghouse® (NSC). Data submitted to the NSC account for 95% of all enrollments in Title IV, degree-granting institutions in the nation.

Variables

The outcome of interest in this study is college enrollment during the 2014-15 school year. Operationally, the outcome is dichotomous, where:
For this study, we hypothesize that the decision to attend college is a function of the students’ participation as a CCC mentor, their prior academic achievement, whether or not they were a member of a traditionally underserved racial or ethnic group (i.e., African American, American Indian, or Hispanic), the percentage of underserved students at their school, and the percentage of students at their school who were eligible for either a free or reduced-price lunch. The measure of prior academic achievement used in this study is the students’ ACT Explore Composite score, defined as the arithmetic average of the student’s scores across the four subject tests (i.e., English, mathematics, reading, and science) offered as part of the test battery. The student’s membership within a particular race/ethnicity was self-reported on a survey provided as a standard part of the ACT Explore test materials. School-level data regarding both the percentage of students receiving free or reduced-price lunch and the distribution of students by race/ethnicity originated from the National Center for Education Statistics’ Common Core of Data for the 2009-10 school year and was matched to the students’ test records by school identifiers. Descriptive statistics for all study variables are provided in Table 1.

**Analysis**

To examine the difference in college enrollment between the CCC group and the control group, we estimated a binary logit regression model which takes the form:

\[
\ln \left( \frac{p_i}{1 - p_i} \right) = x_i \beta
\]

where \(p_i\) is the probability of student \(i\) enrolling in college; \(x_i\) is a vector of predictors for student \(i\), including his or her membership in the CCC group or control group, prior academic achievement, and the aforementioned student and school demographic characteristics; and \(\beta\) is a
vector of parameter estimates that correspond with the predictors. Results from the model that we estimated are provided in Table 2.

RESULTS

When the college enrollment rate is examined descriptively, 62% of the 2009-10 8th grade CCC program mentors had enrolled in college during the 2014-15 school year, compared to only 46% of the 8th graders within the comparison group (See Table 1). Note that the two groups did differ significantly in terms of minority status representation, both at the individual and school level. Therefore, statistical methods were employed to examine the impact of CCC participation on college enrollment to control for group differences on relevant characteristics.

After statistically controlling for differences among the CCC group and the control group in terms of students' prior academic achievement levels (ACT Explore scores), their status as a member of an underrepresented racial or ethnic group, the percentage of students at their school who were members of an underrepresented racial or ethnic group, and the percentage of students at their school who were receiving a free or reduced-price lunch, the difference in the college enrollment rate between the CCC mentors and students within the comparison group remains roughly the same (See Table 2).

When the model estimate for the variable representing membership in CCC group is converted into an odds ratio, we can interpret the difference in the following way: The odds of enrolling in college during the 2014-15 school year are 85% higher for CCC mentors than for students in the comparison group. Specifically, when all other variables in the model are held at their mean values, the predicted probability of enrolling in college is 0.62 for a CCC mentor and is 0.46 for a student in the control group—essentially the same difference that we observed before statistically controlling for other key predictors of college enrollment.
DISCUSSION

The current study found a strong association between participating in the CCC program as a mentor and subsequent college enrollment. The positive results are extremely encouraging. A great deal of research exists pointing to the fact that underserved students are less likely to pursue postsecondary plans. Based on national statistics for the 2013 high school graduating cohort, for example, 66% enrolled in college the following fall; however, the rate for low-income students was under 50% (Kena, Aud, Johnson, Wang, Zhang, Rathbun, Wilkinson-Flicker, & Kristapovich, 2014). The results from the current study indicate that the CCC mentors had enrollment rates that were more similar to the national rate than their underserved peers. Interventions that can effectively improve college enrollment for underserved students hold great promise in reducing educational and occupational disparities that exist by race/ethnicity and SES.

With that in mind, the findings from the current study are correlational, not causal. Although the findings presented here cannot attribute the higher college enrollment rates of the CCC mentors solely to that treatment, the findings do not rule out this possibility. In this study we learned that, if given two students who were the same with respect to their 8th grade achievement level, the status of their membership within an underserved minority group, and the socioeconomic and racial/ethnic representation within their middle school, the student who participated in the CCC program as a mentor would have far greater chances of enrolling in college than the student who did not participate in the program.

Given the magnitude of the difference in the enrollment rates between the two groups—even after the introduction of a modest set of statistical controls into the estimated model—further research that overcomes some of the limitations of the current study would bolster the
evidence for the effectiveness of the program. By design, students are not randomly assigned to participate as a mentor in the CCC program. If students were selected on the basis of some personal characteristics such as motivation or strong academic behaviors, which have also been positively linked to education success, the magnitude of the effect that we have reported may be partly due to unobserved differences in the groups rather than to the CCC program per se (Robbins, Allen, Casillas, Peterson, & Le, 2006). Although we attempted to control for difference among the two groups statistically using typical observed characteristics of the students and their schools, adding measures of currently unobserved characteristics (such as student motivation) would strengthen the evidence for the impact of CCC program participation on college enrollment.

Also by design, the CCC mentors addressed in this study were meant not only to take part in the program curriculum, but also to bring these lessons back to their school and share them more widely with their peers. Additional research should examine student differences in CCC program compliance and the potential effects of the program on other students at the mentors’ schools. In particular, evaluating the impact of the CCC program on college enrollment for peer students who are exposed to the CCC curriculum via mentors is needed to understand the effectiveness of the program at a school level. Additionally, a more robust research design that offers a better method for accounting for the educational experiences and opportunities afforded to students during the high school years could improve upon the current study. Finally, it would be worthwhile to examine whether the CCC mentors continue to achieve educational success at higher rates than their peers in terms of college grades, persistence, and ultimately graduation. Future research should address these research questions.
The earlier ACT evaluation of the effectiveness of the CCC program led to the conclusion that the program has had some success (College and Career Clubs, 2013). However, a true test of the program’s effectiveness could not be conducted until college enrollment information was available for these students. Now those data are available and are the subject of the current study, we reiterate our initial conclusion that the CCC program shows promise in terms of improving educational outcomes for at-risk students.
REFERENCES


Table 1. Means (Standard Deviations) for Study Variables

<table>
<thead>
<tr>
<th></th>
<th>CCC MENTORS</th>
<th>COMPARISON GROUP</th>
<th>COMBINED</th>
</tr>
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<tbody>
<tr>
<td>ACT Explore Composite Score</td>
<td>14.50 (3.09)</td>
<td>14.13 (3.24)</td>
<td>14.17 (3.23)</td>
</tr>
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<td>Underrepresented Minority</td>
<td>0.72 (0.45)</td>
<td>0.48 (0.50)</td>
<td>0.51 (0.50)</td>
</tr>
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<td>Percent Underrepresented Minority</td>
<td>77.23 (20.55)</td>
<td>54.21 (34.31)</td>
<td>56.58 (33.89)</td>
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<td>Percent Free or Reduced-Price Lunch</td>
<td>67.40 (24.17)</td>
<td>64.46 (24.24)</td>
<td>64.76 (24.23)</td>
</tr>
<tr>
<td>Enrolled in College During 2014-15</td>
<td>0.62 (0.49)</td>
<td>0.46 (0.50)</td>
<td>0.48 (0.50)</td>
</tr>
<tr>
<td>N</td>
<td>111</td>
<td>968</td>
<td>1,079</td>
</tr>
</tbody>
</table>
Table 2. *Logistic Regression Results*

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>ESTIMATE</th>
<th>STANDARD ERROR</th>
<th>ODDS RATIO</th>
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<tbody>
<tr>
<td>CCC Mentor</td>
<td>0.61*</td>
<td>0.22</td>
<td>1.85</td>
</tr>
<tr>
<td>ACT Explore Composite Score</td>
<td>0.22*</td>
<td>0.02</td>
<td>1.24</td>
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<tr>
<td>Underrepresented Minority</td>
<td>-0.03</td>
<td>0.17</td>
<td>0.97</td>
</tr>
<tr>
<td>Percent Underrepresented Minority</td>
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<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Percent Free or Reduced-Price Lunch</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.99</td>
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<tr>
<td>Intercept</td>
<td>-2.86</td>
<td>0.43</td>
<td></td>
</tr>
</tbody>
</table>

* * p < 0.01; -2 Log Likelihood = 1357.75 (Likelihood Ratio = 136.19, DF = 5, p < 0.0001)