Providing Opportunities with Technology to Support Traditionally Disadvantaged Students: Examining College Ambition Program

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Abstract

This study examines the impact of the college ambition program (CAP) which is designed to increase postsecondary enrollment particularly for low-income and minority high school students. CAP provides course counseling, financial information, college visits, tutoring, and builds social networks with staff and other students. To measure the impact of the intervention, a quasi-experimental design with panel college enrollment survey data complemented by state administrative data were analyzed. Results indicate that the CAP increased 2-year college attendance for low-income and minority students by 9 %. These results underscore the need to differentiate the features of intervention programs and types of channels in guiding student's choice of enrolling in a 2-year versus 4-year college.

Keywords: postsecondary education; quasi-experimental analysis; program evaluation

Past research has shown several factors that associated with the mismatch between educational expectations and career pathways: low socialization with school culture (Roderick, Coca, & Nagaoka, 2011; Auwarter & Aruguete, 2008); less information they needed for college eligibility (Schmitt-Wilson & Faas, 2016; Crosnoe & Schneider, 2010; Horn, Chen, & Chapman, 2003); disengagement in academic activities related to college preparation and future careers (Broh, 2002; Lareau, 2002) and experiences in under-resourced school environments in terms of personnel, materials and cultural resources (Crosnoe, Cavanagh, & Elder, 2003; Schneider 2009).

Previous research has shown that adolescents' school experiences play a significant role in determining the trajectory of their education expectations and career pathways (Schneider, 2015; Chetty et al., 2014). The absence of guidance and support of college preparation including what courses to take, information about college admission tests, criteria for acceptance, options of college choices has resulted in the present gap in college enrollment between students in low-income families from those students with more family resources (Hoxby & Turner, 2013; Hastings et al., 2016; Darling-Hammond, 2010). While researchers, educational and policy leaders are looking for solutions regarding school-based programs of college counseling, whether and what features of the programs (e.g., type of channels, the frequency or the amount of time using services) that increase low-income and minority students' college enrollment remain underexplored.

CAP (College Ambition Program) was designed to change the college trajectory of high needs students in urban and rural locations. CAP students have limited contact with college counselors, lower access to college test preparation programs, and lack of support for completing financial aid application. In the first phase of the CAP program provided the school with college counseling services and increased overall college attendance by eight percentage points (Schneider, 2015). To scale up the effectiveness of the program in the second phase, the CAP provided counseling and personalized information about college preparation through two information delivering channels: a school-based program and a web-based tool. While the web-based tools (e.g., playlist, badges, websites) have capacity to reach thousands of students who need assistance the most, we know less about the impacts of the web-based tools on increases in low-income students' college enrollment.

Objective/ Research Questions

This study is a quasi-random assignment of the CAP which is operated through CAP centers, which are voluntarily offered to the entire school population. This year, we extended our whole-school design to a web-based tool. We launched a new tool and delivered college financial aid information to all CAP 12th-grade students. This study examines the impact of the CAP on the school level college enrollment rate. Additionally, we also analyze which features of CAP are associated with 4-year college enrollment compared with 2-year college enrollment.

Research questions

1. What is the effect of the CAP on 12th graders' college enrollment rate compared to control schools?
2. Does the impact of the CAP on college enrollment rate vary by school location?
3. What are the features of interventions (e.g., types of activities, the frequency of visits, and the amount of time in CAP center) associated with 4-year college enrollment compared to 2-year college?

Conceptual framework

The goal of the CAP is to reduce the resource differences between the life experiences of low-income and middle- and high-income adolescents. Our theoretical concern derived from *The Ambitious Generation* (Schneider & Stevenson, 1999). Three concepts have been identified to guide students' alignment actions in transition into college, which include (a) visualization—visualizing oneself as a college student; (b) realistic actions—recognizing one's strengths, abilities, and skills and allocating

resources to master them; and (c) strategic plans and preparation—forming a path that maximizes one's college expectations given personal preferences for college environment, interests in particular majors, and recognition of personal talents and skills (Schneider, 2015). This study bases on this framework and proposes two intervention channels to support low-income students in Figure 1. By strengthening the college-going culture through CAP center and a web-based tool for financial aid information, the impact of enhanced program will be examined compared to the previous year.

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Major barriers facing low-income students are their limited understanding of the benefits of attending 2-year versus 4-year college; the preparation required for a college application; and an affordable way to finance postsecondary education. Several studies have shown that information on financial aids and college programs improve college enrollment rates, particularly for low-income students (Tierney & Venegas, 2009; Oreopoulos & Dunn, 2013). Oreopoulos and colleague found that the delivery of financial aid information by video and a calculator increased expectations and attendance in postsecondary education, especially for high school students in disadvantaged schools.

Traditional school counselors in disadvantaged schools do not have the resources to help support the complicated college-going process. Financial aid information can be more effective when coupled with other supports in school, such as career counseling, teacher and student mentoring, and technology (Darling-Hammond, Zielezinski, & Goldman, 2014; Horn, Chen, & Chapman, 2003; Roderick, Coca, & Nagaoka, 2011). While earlier the CAP assumed that providing adult relationships and supportive school community culture, including tutoring, mentoring, course counseling and advising, financial aid planning, and college visits are key strategies in helping students, we propose one possible approach to improve college access for low-income students through digital technologies to disseminate information.

Data and methods

Data. Contact logs were collected from the site coordinators who provided college-related activities and recorded the participation of the students involved in tutoring, mentoring, course counseling, financial aid planning and college visit during 2017 Fall semester to 2018 Spring semester. With the contact logs, we measured the features of the program regarding students' visit to the CAP center; students use of digital material, the frequency of CAP center visits and the amount of time spent in the CAP center.

Sample. Our sample is based on six high schools – five urban and one rural school in Michigan. The analytic sample includes approximately 755 urban and 107 rural 12th-grade students with valid college enrollment outcomes, treatment status, and

covariates. The urban schools' average 4-year college enrollment is 18 percent (2-year college enrollment is 30 percent), economically diverse (62 percent low-income families), and racially diverse (60 percent minority students). The rural schools' 4-year college enrollment is 41 percent (2-year college enrollment is 32 percent), moderately diverse regarding family income (29 percent low-income families), and predominantly white.

Measures

Outcomes. To examine the impacts of intervention at an individual level, we asked that whether 12th graders decided to work, or enrolled in 2-year or 4-year college after graduation. To further examine the impacts of intervention at a school level, we also collected school-level college enrollment rates from 2013-2018 state administrative data.

Research design

Two analyses were conducted, the first is an individual level analysis using logistic regression. We selected only students who enrolled in college after graduation and examined the four features of the CAP associated with 4-year college enrollment compared to students with 2-year college enrollment (See Table 1). In so doing, we aimed to understand which features of the program were more important for low-income students in pursuing a 4-year college education. Importantly, we are aware that there is a large degree of variation in whether students actually received CAP services and the intensity of receiving services. Students can participate in the CAP center voluntarily, which causes bias in estimating the impact of the program at the student level. Thus, the individual level analysis is to examine the importance of CAP features in guiding students' 2-year versus 4-year college enrollment.

The second analysis is to detect the intervention effect of the CAP in whole school design. We applied a quasi-randomization design to evaluate the impact of the program on college enrollment at a school level. Using state administrative data, census data, and the Common Core of Data, we first identified potential schools that had college enrollment rate lower than the state average. To obtain matched control school, we used the state administrative data from the 2008-2009 to the 2012-2013 school year, including four years postsecondary enrollment, school size, percentage of free and reduced lunch, school location, graduation rates, ethnic diversity, and average ACT score. When we identified our control schools, we also conducted *t*-tests and regression analyses to check that there is no difference between treatment and control schools. Each treatment school was matched with five control schools.

After obtaining the control schools, we applied the difference-in-differences method to evaluate the impact of the CAP on college enrollment from 2013-2014 to 2017-2018 school year. This approach allows us to detect the differential treatment effect of the CAP on college enrollment by comparing the pre-treatment and post-treatment between CAP schools and control schools. We concentrated on changes in treatment status and how that corresponded to changes in college enrollment. Currently, we still are waiting for the state administrative data in the school year of 2017-2018. Forthcoming results will be completed before the AERA 2019 conference.

Findings

CAP interventions. Table 1, measures the impacts of the CAP by two variables: (1) whether visited CAP center; and (2) whether used CAP web-based tool. We measured the intensity of using CAP center by two variables: (1) the frequency of CAP center visits; and (2) the amount of time in the CAP center.

Our initial results suggest that visiting the CAP center, the frequency of CAP center visits and the amount of time in CAP center are positively associated with 4-year college enrollment compared with similar students who enrolled in the 2-year college (Table 2). The web-based program acted as additional support to the CAP services. However, it was not an independently significant predictor of 4-year college enrollment. Our preliminary results of the difference-in-differences model from 2013 to 2016 also show that CAP schools increased 6.8 percent in overall college enrollment and 9.4 percent in the 2-year college enrollment compared to control matching schools (Table 3).

Significance

This study contributes to our understanding of whether and how a school-based program and a web-based tool affect students' 2-year and 4-year college enrollment in resource-restricted urban and rural high schools. Unique to this study are methods to detect evidence-based findings through a quasi-experimental design with control matching schools, suggesting the CAP can have an impact on increasing overall college enrollment. The results of the study will inform the field of the potential impacts and challenges of distributing college counseling and personalized information through school-based programs and web-based tools.

Figure 1: Conceptual Framework

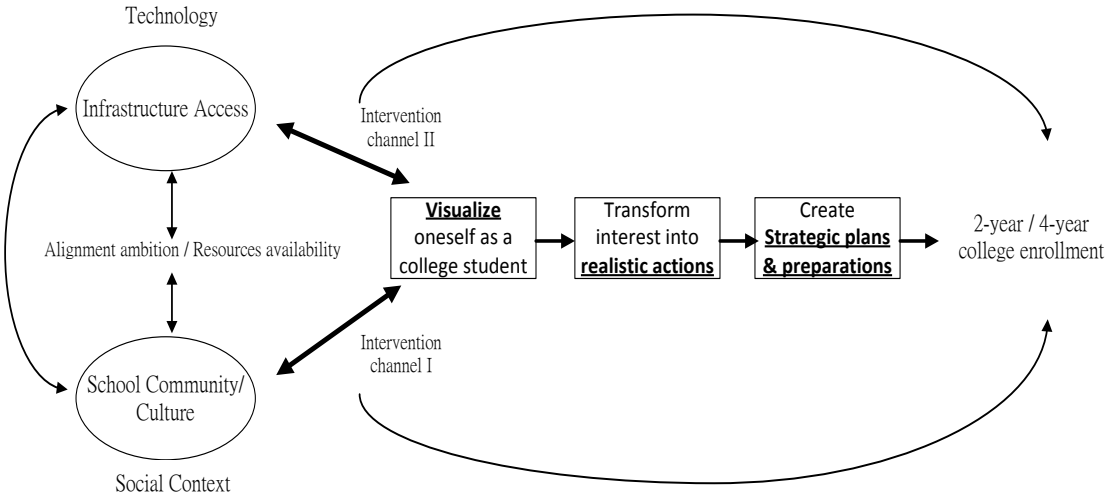

Table 1. Summary of variables at individual outcomes, treatment status, and school characteristics

Outcomes & Constructs	Student Measures
Main outcomes	Overall college enrollment
	2-year college
	4-year college
Individual characteristics	Gender
	Grade level
	Parent education
	Race & Ethnicity
Features of CAP program	
	(1) Whether visit CAP center
	(2) Whether use CAP web-based tool
	(3) The frequency of CAP center visit
	(4) The amount of time in CAP center
School characteristics	
	(1) % of Free-reduced lunch students
	(2) % of students with a college-educated
	(3) % of minority students
	(4) % of English-learners
	(5) student average of ACT composite score

Table 2: Logistic Regression of CAP programs on 4-year college enrollment (compared with students enrolled in the 2-year college)

	Model-1	Model-2	Model-3
Whether visits CAP center	0.663*		
	(0.329)		
Whether uses playlist on the website	-0.397	-0.582	-0.561
	(0.279)	(0.299)	(0.294)
The frequency of CAP center visit		0.062***	
		(0.012)	
The amount of time visit CAP center			0.028***
			(0.005)
N	430	430	430

Note: Sample selected for students enrolled in either 2-yeaar or 4-year college. Reference group= students enrolled in 2-year college. All models include covariates.
* p<.05 ** p<.01 *** p<.001; Standard errors in parentheses.

Table 3: The Difference-in-Difference Model Estimation Results on Overall, Two-year and Four-year College Enrollment from 2013-2016

	Overall		Two-year		Four-year	
	Model-1	Model-2	Model-1	Model-2	Model-1	Model-2
	b/se	b/se	b/se	b/se	b/se	b/se
time	-3.287*	-3.136*	-11.368***	-11.263***	0.688	0.833
	(1.418)	(1.247)	(2.602)	(2.545)	(1.295)	(1.110)
cap	-1.912	0.767	-1.034	2.514	-3.741*	-1.670
	(2.002)	(1.843)	(3.612)	(1.733)	(1.828)	(1.641)
did	6.076*	6.864**	7.615*	9.440**	1.423	2.177
	(2.828)	(2.720)	(3.559)	(3.021)	(2.582)	(2.043)
female		-2.007		4.105		-0.243
		(6.779)		(12.521)		(6.056)
free-lunch		-11.004*		-3.645		-15.751***
		(4.454)		(9.268)		(3.966)
White		7.583**		-4.947		4.807*
		(2.373)		(4.961)		(2.113)
ACT		1.975***		2.105*		2.775**
composited score		(0.567)		(1.007)		(0.967)
constant	56.938***	58.707***	35.424***	38.856***	28.907***	34.105***
	(1.007)	(5.030)	(1.906)	(10.485)	(0.920)	(4.478)

* p<.05 ** p<.01 *** p<.001; Standard errors in parentheses.

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