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ABSTRACT

Previous work (Hoxby and Avery 2014) shows that low-income higher achievers tend not to apply to selective colleges despite being extremely likely to be admitted with financial aid so generous that they would pay less than they do to attend the non-selective schools they usually attend. The Expanding College Opportunities project is a randomized controlled trial that provides such students with individualized information about the college application process and colleges' net prices. In other work (Hoxby and Turner 2013), we show that the informational intervention substantially raises students' probability of applying to, being admitted at, enrolling at, and progressing at selective colleges. In this study, we show that the intervention actually changes students' informedness on key topics such as the cost of college, the availability of the curricula and peers they seek, and the different types of colleges available to them. We highlight topics on which the control students, who experienced no intervention, are seriously misinformed.

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Introduction

The decisions that young people make about college – where to apply, where to attend, how to finance their education, and what course of study to pursue – can greatly affect whether they achieve their earnings, career, and other life goals. Even for students with strong academic preparation, students from low-income families are less likely to graduate from college than their more affluent peers, a factor that contributes to the stagnant college completion rates in recent decades (Bowen, Chingos and McPherson, 2009; Belley and Lochner, 2007). Notably, researchers examining college choice have found that it is at the college application stage – not in college admissions nor matriculation decisions -- where the behavior of low-income, high-achieving students most clearly diverges from that of their higher-income counterparts (Avery and Turner, 2011; Avery and Hoxby, 2012). This situation potentially generates both private and social costs: students may forgo collegiate opportunities that would maximize opportunities for degree attainment and future income, while the cost for society at large is the potential exacerbation of inequality and the limitation of upward mobility.

The Expanding College Opportunities (ECO) project is an intervention designed and implemented by the authors to test the hypothesis that low-income, high achieving students were less likely to apply to resource-intensive colleges and universities because net prices (posted tuition-financial aid) were difficult to ascertain, students found it difficult to navigate the vast quantity of information (of varying quality) about college attributes, and the application process itself appeared daunting. The ECO project delivered semi-customized application guidance, information on net college costs, and no-paperwork fee waivers.

An earlier paper demonstrated that the intervention had significant effects on students' application behavior, the set of institutions to which students were admitted and the resource intensity of the collegiate institutions that they ultimately chose to attend (Hoxby and Turner, 2013). This paper uses rich survey data to provide a deeper assessment of how the ECO intervention affected students' information sets in decision making and other underlying barriers affecting application and matriculation decisions of high-achieving, low-income students. We begin with a brief overview of the ECO intervention and associated survey and then turn to the analysis of how the intervention affects the information about costs, quality, and other factors students use in the college application and matriculation decisions.

Designing, Implementing and Evaluating ECO

Development and Design

The ECO intervention provided guidance on how to apply to colleges, information on what the student would actually pay to attend various colleges (the “net cost” as opposed to the “sticker price”), information about colleges' widely varying graduation rates and instructional resources, and no-paperwork fee waivers for applying to about two-hundred selective colleges. A key feature of the intervention is that each student's materials are customized by analyzing and combining a vast array of data on students, their high schools, their local colleges, and their likely net costs, so that each student received information relevant to his or her circumstances. An important point of emphasis is that ECO did not recommend colleges but rather provided information that was both relevant and in context with the objective of giving students the tools and information that allowed them to make better choices for themselves.

Beginning in 2009, we developed four related interventions to address specific information barriers faced by students and their families in the college choice process: (i) Application guidance, (ii) Financial Aid and Net costs, (iii) Fee waivers, and (iv) Parental Guidance. In the efficacy testing phase, we implemented a comprehensive treatment (ECO-C) that combined information on application strategies and net costs with the dissemination of fee waivers; in the interest of brevity, we concentrate this presentation on results related to ECO-C.

For the 2011-12 academic year, we conducted an efficacy test with materials sent to 18,000 high school seniors, which included multiple treatment groups and a control group, each with a sample size of 3,000 students. Given space constraints, this analysis focuses on the ECO-C treatment. Of the total group of students selected, 12,000 of these were our target students who: (i) scored in the top decile of test-takers of the SAT I or ACT; (ii) had estimated family income in the bottom third of the income distribution for families with a twelfth grader; (iii) did not attend a "feeder" high school. We also randomly selected 6,000 students who met the same test score criteria but who had estimated family income above the bottom tertile and/or attended a feeder high school.

Data and Evaluation Tools

To study students' responses to the ECO-C Intervention, we use two sources of data on the steps they take in choosing a college. First, we surveyed students each summer after they were selected for an ECO treatment or control group. Second, we have collected information on their enrollment, persistence, and progress toward a degree from the National Student Clearinghouse. The results presented in this paper draw on data from the survey of students.

Given our use of random assignment of students to treatment and control status and the relatively large sample, we expect each group to have observable and unobservable characteristics that are the same.¹ Data on students' outcomes were collected from surveys that we conduct each summer (after high school graduation and one year later). The surveys allow us to understand not just what students did but *why* they made the choices they made. 66.9 percent of students answered the survey for the 2011-12 cohort and we find no evidence of differential response among treatment and control groups.

Results: Application, Admission and Matriculation

An overview of the central effects on application, admission and matriculation for target students sets the stage. The estimated “treatment-on-treated” effects of the ECO-C intervention point to large causal effects on the quantity and quality of applications submitted.² The ECO-C intervention caused students to submit 48 percent more applications and be 56 percent more likely to apply to a peer college or university, and to apply to a college with a 17 percent higher four-year graduation rate, 55 percent higher instructional spending, and 52 percent higher student-related spending. These application patterns also produced substantial admissions outcomes: the ECO-C intervention caused students to be admitted to 31 percent more colleges, increased the likelihood of admission to a peer college by 78 percent, and also resulted in admission at colleges with 24 percent

¹ As detailed in Hoxby and Turner (2013), we check that the groups' observable characteristics are, indeed, as similar. To do this, we use the 454 predetermined (pre-treatment) variables that describe the student, his family, his neighborhood, his high school, and the college-going behavior of students in his high school in previous years. These results are consistent with the randomization having worked as intended. Using just the students who answered the survey, we again regress each of the 454 predetermined variables on treatment group and cohort indicators, and found no differential survey response that could bias our results.

² The intervention materials were distributed by a relatively unknown organization and many students disregarded the mailings. Indeed, based on our surveys, only about 40 percent of the students assigned to receive ECO materials could recall seeing intervention materials at all. Because most students disregarded the materials, the effects of the program were likely diminished. To correct for this, we “scale up” the estimates to form an estimate of what economists call the “treatment on the treated” estimate of the effects on the students that actually read the materials. See Hoxby and Turner (2013) for a more detailed discussion of the methodology.

higher graduation rate and 34 percent higher instructional spending. Faced with choice sets that included more resource-intensive institutions, the ECO-C intervention caused students to enroll in colleges that were 46 percent more likely to be peer institutions, whose graduation rates were 15.1 percent higher, and whose instructional spending was 21.5 percent higher.

It is important to note that large effects of the ECO-C intervention demonstrate that many of the application and matriculation decisions made by low-income, high-achieving students in the absence of the intervention were not the product of a well-informed decision. These students could have attended the same schools that they had in the past if their family circumstances or preferences had favored those choices. The fact that they behave differently in the presence of new information indicates that their new choices make them better off.

In this paper, we employ the rich survey data from the ECO project to understand the mechanism through which the intervention affects students' decision making. We focus on two channels: 1) whether the intervention affects students' information about expected net costs and opportunities at different types of collegiate institutions, and 2) what residual misconceptions the students hold about the curricular opportunities and resources at different institutions.

Understanding the ECO Effects

Information problems: Net Price and College Characteristics

“Price” and “match quality” are the most salient dimensions of any large investment like a car, home or college education; yet, low-income students may have a particularly difficult time assessing these characteristics in making decisions about where to apply.

“Price” is difficult for a student to assess because the relevant price for any student (and his family) is the sticker price less available financial aid, what we call “net price.” Yet, with financial aid not announced until months after application at many institutions, many students may be unaware that many of the most selective and resource-intensive institutions are quite affordable as they offer exceedingly generous financial aid. The ECO-C intervention addresses the challenge of forming accurate expectations about net price in several ways – providing salient examples of net price at different types of institutions for a family in similar circumstances, providing a clear explanation of different types of financial aid, and offering a clear explanation of the process of aid application and interpretation of offer letters.

The second dimension where low-income students may have information deficits is in understanding the multi-dimensional differences among colleges and universities and, in turn, what types of colleges may be the best match. If a student and his family have limited college experience, they may hold the belief that “college is college” or assume that some types of colleges are necessarily “bad matches” without fully investigating curricular options. The ECO-C intervention addresses the information deficit about college characteristics by providing salient examples of differences in resources across institutions, describing differences in expected outcomes across different types of institutions and offering an accessible description of the heterogeneity among colleges and universities.

In one set of questions, we asked students to rate factors affecting application and matriculation outcomes, indicating “No difference”, “Somewhat more likely to apply (attend),” “Much more likely to apply (attend)”. Table 1 shows responses on some of the most relevant items related to students’ information sets in making application decisions.

We find that intervention participants increased the weight they placed on the availability of financial aid in making decisions about where to attend. ECO-C participants were about 16 percent (6.24 percentage points) more likely to apply if “I could tell from the college's materials that I would get enough financial aid to attend” and 17.5 percent (3.85 percentage points) more likely to apply to a school if “The college advertised that it admits students without regard to financial need.” An additional question asked students to estimate the sticker price and net price for a family with income of \$40,000 at a selective private university. While many students in both the treatment and control groups overestimate the cost of attendance for a student with substantial financial need, ECO-C participants were 14 percent more likely than the control group to estimate net price at less than \$10,000.

The second dimension on which ECO-C affected behavior is how students use information on college quality. ECO-C participants are 17 percent (3.85 percentage points) more likely to apply when “The college's average student has test scores and a GPA like mine.” and 16.5 percent (4.15 percentage points) when “The college has a high graduation rate.” As ECO-C students increase utilization of financial aid and quality measures about colleges, they reduce the importance of information from friends and family.

Institutional characteristics

How students distinguish among different types of institutions in making application choices is not only an indicator of students' information sets but also a measure of how institutions “match” with the needs of students from low-income families. Beyond asking students where they applied, the survey queried students about why they chose not to apply

to flagship universities, the most selective research universities, and the most selective liberal arts colleges.³

Even as we gave students options in a number of different dimensions for why they chose not to apply to different types of institutions, it is striking that the greatest response came to the open-ended “Other___” option. 36 percent of students who did not indicate applying to a liberal arts college chose this response, while the shares for application to a private research university and the flagship public university were 15 percent and 24, respectively. Notably, ECO-C participants were less likely to choose this response than other students in the target group (10 percent less likely in the consideration of liberal arts colleges and 24 percent less likely in the consideration of research universities). The students’ text responses are particularly illuminating in several dimensions, as they show that many students – particularly those outside the treatment groups – are poorly informed about curricular offerings.

Liberal Arts Colleges

Low-income, high-achieving students systematically lack an understanding of liberal arts colleges. First, a number of students express lack of familiarity with the basic model of a liberal arts college; consider some responses:

“What is a private liberal arts college?”
“I don't know what this is”.
“I don't like learning useless things”
“I am not liberal”

Moreover, an overwhelming number are poorly informed about the majors typically available, assuming that only humanities majors are offered or that “liberal arts” is the major. Responses included:

³ With each type, we provided a definition based on the Barron’s classification and used random assignment to generate an example case. The full question text appears in the online appendix.

“I don’t like art/art related subjects.”

“I’m a math/science guy. I’m not very good at liberal arts.”

“Liberal arts is for people who aren’t good at math.”

“Liberal arts colleges typically do not have mathematics majors.”

We coded several hundred cases indicating responses such as “Does not offer my major.” In a separate question, we asked students about their intended major. While 40 percent of these respondents claiming that their intended major was inconsistent with the curricular options of a liberal arts college intended to major in engineering, the majority indicated intended majors in English, biology, mathematics, economics, politics, physics, psychology etc. It is noteworthy that a number of liberal arts colleges do offer engineering majors, along with professionally oriented majors like education, health, and business.⁴

Further, a number of students perceive that attending a liberal arts college will prevent them from attending professional or graduate schools later or may limit future earnings; examples include:

“I plan on attending medical school.”

“I plan on grad school later.”

“Liberal arts degrees are worthless”

“Limited future career options”

Flagship Public Universities

Turning to why students choose not to apply to flagship public universities, the open-ended responses cast doubt on some commonly held beliefs about the preferences of high-achieving, low-income students.

Quite contrary to a presumption that low-income students would be relatively inclined to stay close to home or at least in-state, a number of students cited a desire to leave

⁴ Authors’ tabulations from the Department of Education’s “Earned Degrees Conferred Survey” show that in 2013, nearly 20 percent of the degrees awarded by private, liberal arts colleges were outside traditional “arts and sciences” fields.

home and find new experiences as a reason for not applying to the state flagship institution.

Examples include:

“I didn't want to go where everyone else from my high school was going, and I wanted to go somewhere more selective.”

“I had no interest in going to the same school as most of the kids I attend HS with.”

“It is too close to home/I know too many people going there.”

Moreover, the appearance of non-academic foci is not an attraction for low-income, high-achievers. Representative comments include:

“My flagship school is too focused on sports and partying, and too big.”

“Students too focused on the party scene (I don't mind parties)”

“XXX has a bad reputation as a party college.”

“Too much party and not enough academics.”

“I don't like football”

“I was not interested in attending an institution with such a sports-centered atmosphere”

While our observations are necessarily limited, we note that students who made these comments about their state flagship university often did not apply to more academically rigorous colleges but instead applied to (and attended) other less selective institutions.⁵ What is unclear is whether big-time athletics and “party atmosphere” genuinely diminish the experiences of high-achieving, low-income students or whether institutions with these reputations fail to make clear the strength of academic experiences.

Conclusion

Careful examination of survey responses about how high-achieving, low-income students make college choices strengthens the understanding of the mechanism through which the ECO intervention affects behavior. We show that provision of relevant

⁵ As an aside, we examined application behavior at institutions classified as athletic powerhouses (BCS rankings in December 2011) and outside rankings of “party schools,” including both public and private institutions/ First, the ECO-C intervention does not increase likelihood of application (matriculation) to either of these school classifications; coefficients are negative in sign and indistinguishable from zero. Secondly, students from the target group are less likely to apply to schools in these classifications than their academically matched peers from higher income families.

information about net cost customized to a family's circumstances and salient information about college characteristics changes how students assess colleges in the application stage ultimately resulting in a stronger set of college options. Our evidence suggests that some dimensions of the modern university such as emphases on big-time athletics and parties may discourage high-achieving students. Finally, our findings also show that even very high achieving students may be poorly informed about curricular and academic options like "liberal arts" and how such collegiate experiences impact graduate and professional study, as well as career outcomes.

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Table 1. Determinants of Students' College Application Decisions, 2011-12 ECO Cohort

<u>Survey Question:</u> How important were each of the following factors in your decision about <i>where to apply?</i>	Target Population			ECO-C Treatment Effect, Target Population
	This factor made no difference to me	Somewhat more likely to apply if the college had this factor	Much more likely to apply if the college had this factor	
b. I could tell from the college's materials that I would get enough financial aid to attend.	23%	33%	44%	0.0624***
c. The college advertised that it admits students without regard to financial need.	50%	26%	24%	0.0385*
g. The college's average student has test scores and a GPA like mine.	27%	38%	35%	0.0532**
h. The college was highly ranked in U.S. News and World Report or a guidebook like Peterson's or Barron's.	30%	31%	39%	0.0387*
i. The college has a high graduation rate.	34%	37%	29%	0.0415**
j. The college's academic programs have a very good reputation.	3%	16%	80%	0.0271
k. The college's extracurricular programs (athletics, music, social work, etc.) have a very good reputation.	27%	44%	29%	-0.0456**
q. Someone in my family attended the college.	74%	17%	9%	-0.0239*
v. Students with an income background similar to mine are well-represented at the college.	80%	16%	4%	-0.00647

Notes: *** p<0.01, ** p<0.05, * p<0.1. The ECO-C Treatment effect is estimated in a regression of the indicator variable for associated with "Much more likely to apply" on treatment status. "Target" population includes high-achieving students in the bottom 1/3 of the family income distribution who did not attend feeder schools. See text and Hoxby and Turner (2013) for additional details.