Labor Market Expectations and Major Choice for Low-Income, First-Generation College Students: Evidence from an Information Experiment*

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Abstract

We conduct a survey experiment with a large sample of U.S. college students to assess how labor market information affects earnings expectations and college major choice for students from different family backgrounds. We find labor market information about post-graduate earnings reduces students' own earnings expectations, though mostly in students' counterfactual majors. We find some evidence of treatment effect heterogeneity by SES. In several fields, high-SES respondents have higher expectations than low-SES respondents; the earnings treatment leads to lower earnings expectations for high-SES respondents, but has no substantive effect for low-SES respondents. We find no evidence that the information treatment changes the probability of choosing a major. Our results build on previous scholarship to suggest that labor market information impacts earnings expectations though has little impact on choice relative to other factors in the student decision-making process.

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Despite large increases in overall college enrollment, there is continuing concern over socioeconomic disparities in education. These disparities are particularly concentrated among low-income students, minority students, and first-generation college students (Engle and Tinto 2008). Low-income, first-generation college students have far lower baccalaureate degree completion rates than their peers, and face many more barriers to success. As this growing educational inequality in higher education is a threat to the nation's economic competitiveness, a variety of policy responses at national, state, and university levels are targeting these groups.

This effort is focused not only on increasing attendance and completion, but also on choosing a field of study (Davies and Guppy 1997; Goyette and Mullen 2006; Lundy-Wagner et al. 2014; Ma 2009). Students from lower socioeconomic family backgrounds (SES) are underrepresented in fields that are more likely to lead to high career earnings and job security, such as science, technology, engineering, and mathematics (STEM). Among explanations for why these discrepancies exist, scholars in both human and cultural capital theory traditions suggest that lower-SES students lack the same degree of access to accurate information about the costs and benefits of a higher education degree as their higher-SES peers (Coleman 1988; Perna 2000; Perna and Titus 2005).

Our paper asks how labor market information influences student expectations about post-graduate earnings in different college majors, and how this information relates to student expectations about completing a degree in these different majors. We partner with a large, public university system with three socioeconomically diverse campuses to conduct a survey with an embedded information experiment. Previous studies with information interventions typically focus on a smaller sample of students at a single college, while our survey includes nearly 3000 students with diverse economic and social backgrounds and who study in different institutional settings in the United States. We then examine whether low-income, first-generation college students hold different earnings expectations than their higher-SES peers,

and how providing earnings information reduces these disparities and impacts choice.

To examine the impact of labor market information, we randomly assign respondents into one of two conditions. One group sees no labor market information while the second group sees median earnings of the U.S population of college graduates from four-year universities. After seeing the information treatment, all respondents report—for each academic major field—their expected future earnings and probability of completing a degree in each major field.

Our main results are as follows. First, we find that students expect to earn above the national median level of earnings, especially in the Business, Health, and STEM fields. Showing respondents labor market information on median earnings reduces the amount they expect to earn post-graduation towards the national median. Labor market information has the largest effect on earnings expectations when respondents are asked about their future earnings in alternative, or counterfactual, majors compared to the fields that they expect to choose or have already chosen. This result is consistent with the informal model of major choice proposed in Hastings et al. (2015), where the cost of acquiring information about majors means that students are likely to have more knowledge about degree programs that correspond to their interests.

Second, we estimate a series of regressions for degree completion probability by treatment condition. We find no evidence that the information intervention affects students' expected probability of degree completion in different fields. Thus, our finding with respect to choice is similar to scholarship that shows information treatments impact earnings expectations though have little or no impact on educational choice (Kerr et al. 2014), suggesting factors beyond earnings are the dominant determinants of choice (Hastings et al. 2017; Wiswall and Zafar 2015).

Third, we find limited evidence that the information treatment differentialy affects students from low-SES family backgrounds. We find low-SES respondents expect to earn less

than their peers in the Business, Education, and Humanities fields. The information treatment reduces the discrepancy in Business and Humanities by lowering the earnings expectations of high-SES respondents, rather than raising the earnings expectations of low-SES respondents. In Education, the treatment reduces the SES-based discrepancy in earnings expectations by increasing low-SES respondents' earnings expectations. Finally, we find no evidence that the information treatment effect varies by family background.

Our work contributes to research investigating the impact of earnings expectations on educational choice (Baker et al. 2017; Hastings et al. 2015; Huntington-Klein 2016a,b; Hurwitz and Smith 2016; Jensen 2010; Reuben et al. 2016). Our research adds to this literature by examining the impact of a randomized information intervention on a large, diverse student sample from a public university system in the United States. In addition, our partnership with the university system gives us access to administrative data that includes a large number of academic and demographic control variables.

Our work also builds on scholarship examining the relationship of socioeconomic discrepancies in the knowledge of college labor market outcomes and educational choice (Beattie 2002; Betts 1996; McDonough and Calderone 2006; Walpole 2003). Similar to Bleemer and Zafar (2015) and Hastings et al. (2015), we find lower-SES respondents have generally similar post-graduate labor market expectations as their higher-SES peers.

Our approach of providing information builds on work that investigates the impact of information interventions on educational choices (Bettinger et al. 2012; Fryer 2013; Hoxby and Turner 2013; Kelly 2015; Nguyen 2013). Our between-group research design includes a randomized information treatment, allowing us to assess the causal impact of median earnings information on students' earnings expectations and expected probability of completing a degree in different fields.

The paper is organized in the following manner. In Section 1 we review the relevant literature on labor market outcomes and student family background on education choice.

Sections 2 through 4 discuss the research questions, the survey and administrative data, and the experimental design. Section 5 presents the results, and Section 6 concludes.

1 Major Choice and Family Background

1.1. Socioeconomic Status and Major Choice

An ongoing concern for policy researchers is understanding the persistent discrepancies in higher education attainment and labor market outcomes for students from different socioeconomic groups. Scholars have documented SES discrepancies in college enrollment and persistence (e.g., Beattie 2002; Engle and Tinto 2008) and major choice (e.g., Lundy-Wagner et al. 2014; Ma 2009). Both economic theories of human capital and sociological theories of cultural capital offer insight into these discrepancies by explaining how a student's family background can influence educational choice and outcomes.

Knowledge of the costs and benefits of college are not necessarily uniform across different groups.[1] Some scholars find that individuals from lower-income families make less accurate estimates about the estimated benefits of a college degree (e.g., Betts 1996), and know less about financial aid (Hoxby and Turner 2013; Olson and Rosenfeld 1984). However, Paulsen (2001) concludes that students are "reasonably careful and accurate in their acquisition of information about earnings differentials ... [they] acquire information that is adequate to make more or less economically rational college-going decisions" (Paulsen 2001, p. 63). Similarly, Rouse (2004) finds that high- and low-income students have similar expectations of the economic returns to college attendance. Hastings et al. (2015) and Bleemer and Zafar (2015) find that low-income students hold less accurate beliefs about past graduates' earnings, though students' own beliefs are similar across income groups. Toutkoushian (2001) shows that low-income, first-generation students expect to attend similar institutions as their higher-SES peers.

[1] See Perna (2006) and Paulsen (2001) for reviews.

Many works have elucidated how family background impacts student career expectations and employment outcomes. The advantages held by higher-SES students often begin before students enroll at college and persist throughout college and into the labor force (Astin 1993; Hu and Wolniak 2010, 2013; Lareau 1993; Walpole 2003). Lower-SES students form different career expectations than their higher-SES peers (Ali et al. 2005; Metheny and McWhirter 2013; Trusty et al. 2000). Social and career-related barriers, such as lack of role models, financial support, and internal and external barriers to career progress, influence career outcome expectations (Lent et al. 2000). Similarly, Ma (2009) discusses the role of parental involvement in the educational decision-making process and the domain-specific expertise about careers that parents provide their children.

Betts (1996) offers several explanations for why family income is related to information about the costs and benefits of college: higher income allows families to acquire more information; working parents offer prospective college students an example of what employment is like in specific careers; and information about the returns to college may not be extensively disseminated in low-income neighborhoods.

Hastings et al. (2015) propose an informal model of degree choice that makes several predictions related to a student's socioeconomic status. In their model, students face uncertainty over the earnings and costs of different degree programs. Students reduce uncertainty by acquiring degree-specific information through a costly search process. Certain groups, such as low-SES students, face higher search costs, as the process of acquiring this information is likely more difficult. Their model predicts that low-SES students have less accurate expectations about post-graduate earnings. They find support for this prediction when analyzing a large sample of students in Chile, while Huntington-Klein (2016b) finds partial support for the model's prediction using a sample of U.S. high school students.

Sociological theories posit that students' outlooks about majors and careers are inextricably linked to their class-based experiences. Bourdieu's work (Bourdieu 1984, 1986) on

cultural capital and habitus observes that higher-income families intergenerationally transmit knowledge and dispositions that are valuable within institutions. In this way, information about how to navigate educational institutions, as well as underlying expectations about educational achievement, are inherent in students' class-based experiences (Lareau and Weininger 2003; McDonough 1997). Further, social capital includes an individual's relationship to social networks, which can connect to valuable resources or information. Access to these social networks also varies by social class and can impact educational decision-making (Coleman 1988; Perna 2000; Perna and Titus 2005).

The research builds on a growing body of literature that examines the link between post-graduate earnings and educational choice. Early work focuses on how expected earnings influence the demand for post-secondary education (Berger 1988; Manski and Wise 1983; Willis and Rosen 1979). Building on Manski's work (Dominitz and Manski 1996; Manski 1993; Manski and Wise 1983), more recent studies examine how students' subjective expectations about future earnings influence major choice or college enrollment (Arcidiacono et al. 2012; Attanasio and Kaufmann 2012; Delany et al. 2011; Jensen 2010; Wiswall and Zafar 2015). This work suggests that student expectations of post-graduation earnings influence their educational choices, although the impact of preferences or taste is greater than expected earnings.

All these works follow a human capital perspective of educational choice, where information—knowledge of the costs, benefits, risk, and opportunities—plays a key role. An idealized human capital framework assumes that students possess perfect information about the costs, benefits, and risk, and use that information to rationally choose the most efficient educational option. Scholars have investigated the validity of these assumptions by asking what students actually know about post-graduate earnings outcomes, how expectations are measured, and how students expectations are formed in the first place (Avery and Kane 2004; Beattie 2002; Betts 1996; Botelho and Pinto 2004; Manski 1993; Paulsen 2001).

1.2. Low-Income, First-Generation Students and Socioeconomic Status

Student socioeconomic status is a broad construct that includes a student's financial, social, cultural, and human capital resources (NCES 2012). Because SES includes so many different factors of a student's family and personal background, no consensus exists on how to measure it. In general, SES measurement involves an index of the "big three" items: parental education, parental occupational status, and household or family income (NCES 2012).

Our focus in this project is on two components of the broader concept of student SES: family educational status and family income.[2] While only representing a partial component of SES, low-income students who are the first in their family to attend college share many of the same barriers to higher education as do most lower-SES students. In particular, first-generation college students are likely to lack information sources about college and different academic majors that are available to students with a college graduate in the family (Horn and Nuñez 2000; Ishitani 2006). Low-income students are likely to lack institutional resources—such as quality school counselors and teachers—that help disseminate information about college and careers (Avery 2009; Hoxby and Turner 2013).[3]

2 Research Questions

The human capital and social capital theoretical frameworks offer explanations for how information provision influences earnings expectations and educational choice. In addition, the literature explains mechanisms for how family characteristics influence educational attainment and earnings expectations: students from lower-SES families may lack equal access or pay a higher cost to acquire information about the economic returns to different educational choices.[4] Motivated by each theoretical perspective's focus on information and preferences

[2]Our survey includes no information about family occupational status.

[3]At points in this manuscript, the terms "SES" and "family background" are used interchangeably for stylistic reasons.

[4]Paulsen (2001, p. 75) discusses the shared focus of these two theoretical approaches on the influence of family background. Researchers who have used both theoretical models to study student educational choice

over majors, we study the following research questions:

1. Does providing students with labor market information about median earnings change their own earnings expectations in different majors, relative to students who do not see any labor market information?

2. Does providing students with labor market information about median earnings change their own expectations about the field of study in which they intend to complete a degree, relative to students who do not see any labor market information?

3. Does the effect of labor market information about median earnings vary systematically by student's socioeconomic status?

The first research question introduces the information treatment. Specifically, we ask whether providing labor market information on the median earnings of different majors changes beliefs about students' future earnings. The second research question investigates the impact of earnings information on the expected probability of completing degrees in different majors. The third research question examines whether the effect of labor market information varies by a student's family background status. This final question assesses whether information provision reduces any inequalities in information across different family background groups. In particular, if low-income, first-generation students have biased estimates of the population earnings in each major, then the information intervention should have a larger effect on this group of students.

3 Data Source

Our data source is an original survey administered to the students at three separate campuses of a large, public university system.[5] To administer the survey, we partnered with the

include Ma (2009), Lundy-Wagner et al. (2014), and Wells and Lynch (2012).

[5]We exclude respondents from one specialty campus that has its own admissions process and all students must major in the field of healthcare. For these students, there is no option to change majors as that would

university system's office of institutional research (OIR), which has extensive experience fielding large surveys with the student body. Before OIR launched the survey, we designed a university system-wide marketing strategy to raise awareness about the forthcoming survey. Research assistants distributed fliers in high-traffic areas of campus, engaged with student clubs and residential halls, and used social media accounts to post advertisements. We also partnered with university staff in student affairs and other special offices whose primary mission involves service to lower-SES students. Through these partnerships, we spoke to several different student groups about the survey, or provided advertisement material to administrative staff who then distributed it to the students via an email campaign and in-person discussion. These outreach efforts began in September 2015 and continued until we closed the survey.

OIR emailed the survey to all undergraduates at the three campuses on 11/3/2015. The office sent follow-up emails on 11/9/2015, 11/16/2015, and 11/23/2015. The survey closed on 11/30/2015.[6] The email text explained the survey and the incentive structure. Students who completed the survey were entered into a lottery for one of six $500 Visa gift cards or one of ten $100 gift cards.[7] The email included a link to an online survey hosted by Qualtrics, where students agreed to take the survey by signing an online consent form.

The email invitation reached 48,139 undergraduate students. The response rate was 12.9 percent, with 6,243 students responding and 4,908 students completing the survey.[8] As stated above, we remove respondents from the health sciences campus, foreign students, and

imply leaving college. The results are not substantively different with this group of 164 students included.

[6]Together with OIR, we decided to field the survey late in the fall academic semester, as OIR had another survey in the field earlier in the semester and was concerned about survey fatigue. The office generally prefers to have only one survey in the field.

[7]Each week we randomly selected up to three winners from the list of completed respondents. With the winners' permission, we included their names and photos in the follow-up emails in order to encourage more participation.

[8]We find no significant difference in observables between non-completers and completers. However, we find some differences, common to online surveys, in those who choose or decline to respond to the survey. See supplementary materials for these statistics. We also remove foreign students from the sample.

98 respondents for which the administrative data is missing first-generation status.[9]

The full survey includes three randomized treatment conditions; we remove all respondents in one of the three conditions, as the information provided in this condition is not relevant to this current study.[10] The remaining sample size is 2965 students.

The average time to complete the survey was 10 minutes and 53 seconds. Descriptive statistics that compare the respondent sample to the overall university system and U.S. undergraduate student population are presented in Table 1.

	Sample	University System	National
Freshman	22%	20%	25%
Sophomore	19%	20%	19%
Junior	27%	26%	21%
Senior	32%	32%	28%
Male	34%	48%	44%
Caucasian	44%	40%	71%
African American	11%	10%	16%
Asian	24%	23%	6.8%
Hispanic	16%	15%	12%
Other	6%	5.5%	
SAT Math	605	603	522
SAT Verbal	576	559	518
First Gen.	20%	20%	31%
Pell Grant	29%	28%	39%
Business	17.5%	19%	20%
Education	0.05%	0.06%	6.9%
Health	8%	8.2%	12.2%
Humanities	6.7%	5.9%	14%
Other	6.6%	5.9 %	9.3%
Social Science	13.1%	11.4%	18.6%
STEM	17%	17%	17%
Undeclared	31%	32%	1.9%

Table 1: Descriptive statistics of the sample and university data from the university office of institutional research. U.S. data from the National Center of Education Statistics, 2008/2012 Baccalaureate and Beyond (B&B). Large percentage of "undeclared" students in survey and university data due to many students not officially declaring major until their third or fourth year.

The descriptive statistics in Table 1 show that the sample is similar to the overall university population on a number of observable demographic and academic characteristics. The

[9]The findings for the overall treatment effect are unchanged when including these cases. Though missing first-generation status, these cases have data on Pell status. We analyze the results using a Pell grant indicator only for SES status and find similar results.

[10]Since the treatment groups are formed through randomization, excluding one group results in no systematic biases in the sample. The supplementary materials contains analysis showing that the randomization procedure successfully balanced observable characteristics across treatment groups.

one exception is gender, with the sample including a lower percentage of men than the overall university population (34 percent in the sample versus 48 percent in the university system). This gender discrepancy has been documented in the institutional research literature (see Underwood et al. 2000).

We also compare the university system to the United States population of undergraduate students in 2014. While similar on many dimensions, the university system has a different racial profile, with a higher percentage of Asian students than the national student population. The university system also has slightly higher SAT scores than the national average, and a lower percentage of first-generation college students and Pell grant recipients. As such, we use caution when extrapolating the results presented below to the general four-year college student population; however, the experimental design presented in the following section allows us to measure, with a high degree of internal validity, the treatment effect on a large, diverse convenience sample of college students.

3.1. Survey and Experimental Design

Upon agreeing to take the survey, respondents answer several questions about their educational background. We then ask questions related to their expectations of post-graduation earnings and expected major choice. Specifically, students evaluate six major fields: Business, Education, Healthcare (Health), Humanities, Social Science, and STEM.[11] For each major grouping, we ask students to consider the type of careers associated with each major, and then to estimate their earnings if they were working full time in the fifth year after graduation.[12]

[11]There are many specific majors in the university system. To reduce the number of options given to students, we group these individual majors into these categories, which are similar to those used, for example, in Caner and Okten (2010). We define STEM as a combination of engineering, biological and physical sciences, and computer science.

[12]We ask students to consider five years for two primary reasons: 1) Asking students to consider a period right after graduation would perhaps not allow for sufficient time to find a job in the major; and 2) We allow students who plan to attend graduate school time to complete their advanced degrees and enter employment.

Earnings question: If you were to receive a Bachelor's degree in each of the following fields of study and you were working full time 5 years after graduation, what do you believe is the most likely amount that you would earn per year?

Major Choice: What is your likelihood of completing a degree in each field of study? That is, what do you believe is the percent chance (or chances out of a 100) that you would graduate with a major in each of the following categories?

The first question asks respondents to estimate their future earnings outcomes in the six major groups. Respondents use a slider to pick the dollar amount they expect to earn in each major. We then ask respondents to report their expected probability of completing a degree in each of the major groups.[13] Respondents type the numbers directly into six cells that together must sum to 100.[14]

3.2. Treatment Description

The following two experimental treatments allow us to answer whether information provision changes students' estimates of labor market outcomes and major choice, relative to a baseline where students see no labor market information:[15]

No Information: Respondents receive no labor market information.

Median Earnings: Respondents receive the median earnings of graduates in each major field.

[13]The wording for both these questions is similar to Wiswall and Zafar (2015).

[14]As in Baker et al. (2017) and Wiswall and Zafar (2015), the probabilities are constrained to sum to one in order to approximate a real-world choice situation. For some particular research questions, this constraint also allows the researcher to use a generalized ordinal logit model to estimate the choice probabilities

[15]Data source for labor market information is the U.S. Department of Education, National Center for Education Statistics, 2008/12 Baccalaureate and Beyond Longitudinal Study (B&B), accessed through NCES PowerStats. We use data from the year 2012 so that data reflects respondent status four years after graduation. Respondents were not told the data are from 2012. To correspond with our question wording, respondents were told that the data was from five years after graduation rather than four. We limit B&B data to graduates who are working full-time. See supplementary materials for the survey instrument and the tabular and graphical data displays we show respondents.

3.3. Pretesting

We pretested the survey instrument and experimental design for several months before the November launch. In total, we had 70 test responses spread over 9 different test surveys. We worked with several administrative offices in the university system in order to ensure the pretesting subjects represented the economic diversity of the students in the university system. These surveys tested different branching schemes, question types, and digital layouts. The first tests took place in August and September 2015. As the surveys were tested, we revised question wording, graphics, and layouts. The tests continued into October 2015, and the survey was finalized for distribution the first week of November 2015.

3.4. Administrative Data

Through our partnership with the university system's office of institutional research, we use unique student identifiers to match survey responses to an administrative database of student and family characteristics. These data include demographics and academic information, as well as our key variables of student first-generation status and our measure of family income, which is whether or not the student receives a Pell grant.[16]

4 Empirical Strategy

The first and second research questions are causal: we ask whether labor market information affects expectations of post-graduate earnings and expectations of major completion. Though treatments are randomized, the third question is descriptive in nature. We cannot randomly assign family background to respondents, but we can assess evidence for treatment effect heterogeneity by first-generation and low-income status. Similar to Engle and Tinto (2008), we divide family background into three mutually exclusive groups. We identify whether

[16]The university office specifically identifies each student as first generation or not. The data on family income dollar amount are missing in too many instances to be of use; we therefore use Pell grant status as the alternative.

a respondent's family background is low-income and first-generation, low-income or first-generation, or does not belong to either of these groups. With this coding scheme, our intent is to create variation in socioeconomic status such that the low-income or first-generation group has one socioeconomic disadvantage, while the low-income and first-generation group has two socioeconomic disadvantages.

We observe several outcome variables in our survey. The first outcome variable is the annual dollar amount a respondent expects to earn post-graduation for each major field; the second outcome is the expected probability of completing a degree in each major field. Each outcome measure requires a different estimation strategy.[17]

4.1. Students' Preferred Major versus Counterfactual Major

Our analysis asks respondents about their labor market expectations for their own major and counterfactual majors that they are not currently pursuing or interested in pursuing. Respondents may have more knowledge about the labor market outcomes for their own preferred major since they have a greater incentive to seek out information for the types of careers they are interested in pursuing than for those in which they lack interest (Arcidiacono et al. 2012). Costly search may also reduce student effort to learn about majors outside of their interest area (Hastings et al. 2015).

4.2. Estimation of Earnings Expectations

To measure the relationship of family background and the median earnings treatment on earnings expectations, we use ordinary least squares to estimate the following equation:

$$\ln w_{ik} = \beta_{0k} + \beta_{1k} * \mathrm{T}_{i1} + \beta_{2k} * \mathrm{FB}_{ia} + \beta_{3k} * \mathrm{FB}_{ib} + \boldsymbol{\beta_{4k}} \boldsymbol{X_i} + \epsilon_{i,k}, \tag{1}$$

[17] We top-code earnings responses at \$150,000 to reduce the influence of any outlier responses. We also calculate the probabilities from the percentages, which we then recode from 0 to 0.001 and from 1 to 0.999. This allows us to take the log of the probability, and, similar to Wiswall and Zafar (2015) and Baker et al. (2017), allows for the use of a log-odds model of choice, which we use in a related paper.

where ln w_{ik} is the log wages of respondent i in major k, T_1 is an indicator for the Median Earnings treatment, FB_a is an indicator for family background status that is first generation or low income, and FB_b is an indicator for family background status that is first generation and low income. The vector $\boldsymbol{X_i}$ includes the following individual-level covariates: gender, age, race, grade point average, ordinal ranking of probability of attending graduate school, campus, and class level in school (first-year through senior).

To answer the first research question, we focus on the coefficient estimates of β_1 and test whether the estimates are substantively meaningful and statistically different from zero. To answer the third research question, we focus on the estimated interactions between the treatment and family background indicators.

4.3. Estimation of Major Completion

Our second outcome measure is the log probability of choosing and completing a degree in major group k. We use ordinary least squares to estimate the following equation:

$$\ln \pi_{ik} = \beta_{0k} + \beta_{1k} * \mathrm{T}_{i1} + \beta_{2k} * \mathrm{FB}_{ia} + \beta_{3k} * \mathrm{FB}_{ib} + \boldsymbol{\beta_{4k}} \boldsymbol{X_i} + \epsilon_{i,k}, \tag{2}$$

where ln π_{ik} is the log expected probability of completing a degree in group k. The covariates are the same as in Equation 1. Our specification to estimate major completion probability is similar to Baker et al. (2017).

For the choice analysis, we limit our analysis to first-year, sophomore, and junior students only, who are likely to face fewer academic and financial barriers to switching majors than senior students. Examples of barriers to switching includes the investment in prerequisite coursework for the current major. Switching majors may require additional coursework and effort, delaying graduation and increasing the overall costs of college attendance. Results obtained using the full sample of students are substantively similar.

In the choice analysis, 246 respondents answer by assigning the same maximum proba-

bility of completing a major to more than one major (for example, 50% for Social Science and 50% for Humanities). Of these 246 respondents, 200 select two majors to be their most likely major. These respondents are likely dual majors, while other respondents are likely undecided. Results reported below are substantively similar if we include a dummy variable for these respondents or omit them from the analysis.

5 Results

We now present the estimation results for Equations 1 and 2. We first present the results for the impact of the information treatment on earnings expectations. Second, we show estimates of the impact of the information treatment on major completion probability. Finally, we present our estimates of heterogeneous treatment effects by family background status.

5.1. Earnings Results

We find strong evidence that the Median Earnings information treatment affects earnings expectations. The results from Equation 1 are presented in Table 2. Each column contains separate regression results for the six major fields. Heteroskedasticity-robust standard errors are in parentheses. To evaluate the statistical significance of the estimates, we mark coefficients with stars that represent significance at the 0.1 level, 0.05 level, the 0.01 level, and a more stringent 0.0042 level. The 0.0042 level is a conservative significance level obtained using the Bonferroni method to account for testing multiple hypotheses.[18] All the regressions in Table 2 include the covariates described in Equation 1. For presentation reasons, we omit several covariates from the tables to focus on the treatment indicators. We present the full tables in the supplementary materials.[19]

[18] We adjust for the α to account for 12 hypothesis tests in Table 2: 6 separate regressions and 2 dependent variables (earnings and major choice).

[19] Regression specifications we present feature low R^2, which suggest the explanatory variables and treatment explain little variation in the dependent variables. A concern with such low R^2 values is omitted variable bias, but the treatment estimates are still unbiased due to the randomization procedure (Wooldridge 2012, p. 201).

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	-0.10^{***}	-0.02	-0.08^{***}	-0.06^{***}	-0.06^{***}	-0.08^{***}
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income or First Gen.	-0.07^{***}	-0.03	-0.03	-0.02	-0.01	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income and First Gen.	-0.08^{**}	-0.04	-0.04	-0.04	-0.05	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Gender	0.06^{***}	0.09^{***}	$0.03^{\cdot}$	0.05^{**}	0.02	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.00	0.01^{***}	-0.00	0.01^{***}	0.01^{***}	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.04	0.02	0.02	0.02	0.03	0.02
N	2957	2957	2957	2957	2957	2957

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table 2: OLS estimates of expected earnings per major on treatment indicator. Regressions also include family background indicators, and demographic and academic controls. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.

In the row Median Earnings of Table 2, all the coefficient estimates are negative and five out of six reach levels of statistical significance surpassing even the Bonferroni-corrected critical value. The results also have substantive significance. For the Business column, the estimate on the Median Earnings indicator of -0.10 results in a -9.5 percent decrease in log expected earnings. The -0.08 estimate on the Median Earnings indicator in columns Health and STEM results in a -7.7 percent decrease in log expected earnings. The percent changes for columns Humanities and Social Science are smaller, equaling a -5.8 percent change in log expected earnings.

Tables 3 and 4 suggest that earnings information has the greatest effect on respondents who are asked about earnings in a field other than their own preferred major. Table 3 shows results for earnings expectations about respondents' preferred major. In this table, the Median Earnings indicator across major fields has smaller effects in magnitude and less precise estimates than the pooled estimates in Table 2. Only among those who prefer Business majors is the Median Earnings indicator statistically significant at the Bonferroni-

corrected value.

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	-0.09^{***}	-0.04	-0.05	0.08	-0.03	$-0.04^{\cdot}$
	(0.03)	(0.06)	(0.04)	(0.06)	(0.04)	(0.02)
Low Income or First Gen.	-0.05	-0.10	-0.01	0.03	-0.03	-0.04
	(0.03)	(0.07)	(0.05)	(0.07)	(0.04)	(0.03)
Low Income and First Gen.	-0.11^{*}	-0.29^{*}	-0.00	0.05	-0.04	-0.03
	(0.05)	(0.11)	(0.06)	(0.08)	(0.06)	(0.04)
Gender	0.07^{**}	0.07	0.11^{*}	0.06	-0.03	0.07^{***}
	(0.03)	(0.08)	(0.05)	(0.06)	(0.05)	(0.02)
Age	-0.00	0.01	0.00	0.00	0.01	-0.01
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
R^2	0.06	0.12	0.04	0.05	0.08	0.04
N	739	252	486	326	544	1073

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table 3: OLS estimates of expected earnings per major on treatment indicator. Regressions also include family background indicators, and demographic and academic controls. Sample limited to responses about preferred major. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni method correction.

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	-0.10^{***}	-0.02	-0.09^{***}	-0.08^{***}	-0.06^{***}	-0.10^{***}
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income or First Gen.	-0.08^{***}	-0.02	-0.03	-0.03	-0.02	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Low Income and First Gen.	$-0.06^{\cdot}$	-0.01	-0.06	-0.05	-0.06	0.03
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Gender	$0.04^{\cdot}$	0.09^{***}	0.04^{*}	0.06^{**}	0.04^{*}	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Age	0.00	0.01^{***}	0.00	0.01^{***}	0.01^{***}	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.04	0.02	0.02	0.03	0.03	0.02
N	2218	2705	2471	2631	2413	1884

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table 4: OLS estimates of expected earnings per major on treatment indicator. Regressions also include family background indicators, and demographic and academic controls. Sample limited to responses about counterfactual majors. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.

In contrast, Table 4 shows results when we elicit expectations about respondents' counterfactual majors. This table reveals that the information treatment has the largest effects on respondents when asked about earnings in a major other than their own. The Median Earnings treatment indicator is substantively large and statistically significant in all major fields except Education.[20]

5.2. Choice

In Table 5, we present the OLS estimates of Equation 2. While the magnitude of the Business and Education coefficient estimates in row Median Earnings are substantively large, none of the estimates reaches conventional levels of statistical significance. All estimates are imprecise with relatively large standard errors. Thus, we cannot reject the null hypothesis of zero effect.

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	−0.08	0.11	0.03	−0.03	0.01	0.06
	(0.13)	(0.11)	(0.12)	(0.11)	(0.12)	(0.13)
Low Income or First Gen.	−0.06	0.07	0.17	0.04	0.28$^{\cdot}$	0.11
	(0.15)	(0.13)	(0.14)	(0.13)	(0.14)	(0.15)
Low Income and First Gen.	−0.21	0.19	0.20	0.26	0.14	0.06
	(0.23)	(0.21)	(0.23)	(0.22)	(0.22)	(0.24)
Gender	0.43***	−0.27*	−0.57***	−0.37***	−0.47***	0.88***
	(0.14)	(0.12)	(0.12)	(0.12)	(0.13)	(0.13)
Age	−0.01	0.00	−0.04**	0.03	0.03	−0.05***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
R^2	0.04	0.02	0.06	0.03	0.04	0.08
N	2005	2005	2005	2005	2005	2005

$^{***}p < 0.005$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table 5: OLS estimates of expected probability of completion per major on treatment indicator. Sample excludes senior respondents. Regressions also include family background indicators, and demographic and academic controls. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.

[20]See the supplementary materials for details on coding respondents "in major."

5.3. Family Background and Information Treatments

In Section 1, we discuss several reasons why low-income, first-generation students may hold different labor market expectations than their higher-SES peers. Ma (2009) describes how the parents of higher-SES students are more involved in educational decision-making, while Hastings et al. (2015) note that low-SES students have higher search costs than their peers since labor market information is not as readily accessible to them. Before reporting earnings expectations and choice, we first examine whether low-SES respondents are more likely to report low parental involvement in their educational decision-making process. Low parental involvement can lead to higher search costs for major-specific information.

Our survey contains several questions that allow us to gauge whether low-SES respondents have less parental involvement in educational decision-making than their higher-SES peers. Table 6 shows descriptive statistics for answers to the question, "I can rely on my family to:" followed by the prompts: *help advise me on my selection of college major; help advise me on my selection of career; advise me on how to find a job or internship; introduce me to people who can help me get a job or internship; provide me with financial support while I am getting my career started.* For each prompt, respondents reply on an ordinal scale from "never" to "all of the time." For simplicity of presentation, we do not present the percentages for the full ordinal scale. Rather, we calculate the share of respondents answering "never" or "rarely" for each prompt.[21]

The descriptive statistics in Table 6 show that low-SES students are more likely to report being unable to rely on parents for education and career-related decision-making. For all prompts, low-SES students are more likely to report being able to "never" or "rarely" rely on their parents. All the differences are statistically significant. To the extent that the lack of parental involvement raises search costs for low-SES students, these differences can help

[21] Alternatively, we could calculate the share of respondents answering "often" or "all of the time." The results are substantively similar.

explain heterogeneity of earnings expectations by family background status.

Parental Aid	Neither	Low-Income or First Gen.	Low-Income and First Gen.
Advise major	0.19	0.34**	0.43**
Advise career	0.17	0.31**	0.41**
Advise finding job/internship	0.24	0.42**	0.56**
Career networking	0.30	0.44**	0.59**
Financial support during job search	0.12	0.26**	0.33**

$^{**}p < 0.01$

Table 6: Reliance on parents for career-related guidance by family background status. Table shows average of dichotomous variable equal to one if respondents state they "never" or "rarely" can rely on their parents for the given activity, and zero otherwise. Significance tests from linear regression of dichotomous dependent variable on indicators for family background status.

5.3.1 Earnings Expectations

Descriptive statistics of log expected earnings by family background status are shown in Table 7. Respondents from low-income and first-generation backgrounds have similar earnings expectations when compared to their higher-SES peers. The difference in means is statistically significant only in Business and Education, where low-income and first-generation students expect to earn less than their higher-SES peers.

Major	Family Background	Mean
Business	Neither	11.25
	Low-Income or First Gen.	11.18**
	Low-Income and First Gen.	11.14**
Education	Neither	10.74
	Low-Income or First Gen.	10.72
	Low-Income and First Gen.	10.67**
Health	Neither	11.17
	Low-Income or First Gen.	11.17
	Low-Income and First Gen.	11.15
Humanities	Neither	10.67
	Low-Income or First Gen.	10.64
	Low-Income and First Gen.	10.60
Social Science	Neither	10.74
	Low-Income or First Gen.	10.76
	Low-Income and First Gen.	10.72
STEM	Neither	11.33
	Low-Income or First Gen.	11.31
	Low-Income and First Gen.	11.32

$^{*} * p < 0.05$, $^{*}p < 0.1$

Table 7: Mean expected earnings by family background status. P-values from two-sided difference in means test shown. The Low-Income or First-Generation group and the Low-Income and First-Generation group are separately compared to the base group that is neither low-income nor first-generation. Category "Neither" refers to neither low-income nor first-generation respondents. Statistics calculated using only respondents in the baseline condition.

Table 8 shows the regressions for log earnings on the treatment indicators, the family background indicators, and their interaction terms. The covariates are the same as the specifications in Table 2. We find little evidence for heterogeneous effects by family background status. Only the Education interaction estimate is statistically distinguishable from zero at the 0.05 level. The positive and substantively large coefficient on the interaction term Median Earnings x Low-Income and First-Gen. suggests that median earnings information increases the expectations of low-income and first-generation respondents compared to similar respondents who see no information.[22]

[22]Similar to the pooled sample result, we find that the treatment impact is largest when respondents

We also use a F-test to test the null hypothesis that the interaction terms between treatment indicator and family background are jointly equal to zero. Only one of the six F-tests, for Education, achieves statistical significance.

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	-0.11^{***}	-0.04^{*}	-0.07^{***}	-0.08^{***}	-0.07^{***}	-0.08^{***}
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income or First Gen.	-0.07^{*}	-0.04	-0.01	-0.05	-0.02	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Low Income and First Gen.	-0.12^{***}	-0.10^{*}	-0.03	-0.09^{*}	-0.06	-0.01
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
Gender	0.06^{***}	0.09^{***}	$0.03^{\cdot}$	0.06^{**}	0.02	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.00	0.01^{***}	-0.00	0.01^{***}	0.01^{***}	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Median Earnings x Low Income or First Gen.	-0.01	0.03	-0.04	0.05	0.02	-0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Median Earnings x Low Income and First Gen.	0.09	0.12^{*}	-0.04	$0.11^{\cdot}$	0.02	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)
R^2	0.04	0.02	0.02	0.02	0.03	0.02
F-Test p-value	0.22	0.10	0.59	0.17	0.90	0.55
N	2957	2957	2957	2957	2957	2957

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table 8: OLS estimates of expected earnings per major on treatment indicator, family background indicators, interactions between treatment and family background indicators, and demographic and academic controls. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni method correction.

Taken together, we find that for the major fields in which earnings discrepancies exist by family background, the information treatment tends to reduce the discrepancies. In Table 8, the estimates in row Low Income and First Gen. show that low-income and first-generation respondents expect to earn less than their high-SES peers in Business, Education, and Humanities. The estimates for these major groups are substantively large and statistically significant at least at the 0.05 level. However, in the Median Earnings group, these differences are reduced, as indicated by the positive interaction terms in row Median Earnings x Low Income and First Gen.

To better illustrate this result, we use the regression estimates to predict the average

report earnings expectations of counterfactual majors. These regressions are presented in the supplementary materials.

expected earnings by treatment group and family background status.[23] Table 9 shows the predictions.[24] For Business, Education, and Humanities, we find a statistically significant difference in expected earnings between family background groups in the No Information condition, while in the Median Earnings condition we find that the difference is statistically indistinguishable from zero. For Business majors in the No Information condition, the estimated difference in earnings between family background groups is 0.12. In contrast, for Business majors in the Median Earnings group, the estimated difference is 0.02 and the 95% confidence interval overlaps zero. The difference is reduced due to the treatment reducing high-SES respondents' earnings expectations more than low-SES respondents' expectations.

Respondents in the Humanities major group present a similar result. The predicted difference between family background groups in the No Information condition is 0.09, while the predicted difference in the Median Earnings condition is -0.02 with a 95% confidence interval that overlaps zero. As with the Business major group, the difference is reduced due to the treatment reducing high-SES respondents' earnings expectations more than low-SES respondents' expectations.

[23]We calculate the expected value of the dependent variable, as well as the estimated difference and 95% confidence interval, using the simulation function of the Zelig (Imai et al. 2008) package for the statistical software R.

[24]Formally, the estimated difference is defined as $\Delta = E[\pi|\text{Median Earnings}, X] - E[\pi|\text{No Information}, X]$, where Δ is the difference, π is the probability of completing degree k, and X is a vector of covariates.

Major/Treatment Condition	Predicted Earnings Low-SES	High-SES	Difference	CI
Business (No Information)	11.13	11.25	0.12	(0.04, 0.2)
Business (Median Earnings)	11.11	11.14	0.02	(-0.05, 0.12)
Education (No Information)	10.6	10.7	0.1	(0.02, 0.17)
Education (Median Earnings)	10.68	10.65	-0.03	(-0.11, 0.37)
Health (No Information)	11.10	11.13	0.03	(-0.05, 0.12)
Health (Median Earnings)	11.00	11.06	0.06	(-0.02, 0.15)
Humanities (No Information)	10.53	10.62	0.09	(0.00, 0.18)
Humanities (Median Earnings)	10.55	10.54	-0.02	(-0.11, 0.08)
Social Science (No Information)	10.64	10.70	0.06	(-0.03, 0.14)
Social Science (Median Earnings)	10.59	10.63	0.04	(-0.05, 0.12)
STEM (No Information)	11.31	11.32	0.02	(-0.06, 0.09)
STEM (Median Earnings)	11.27	11.24	-0.03	(-0.11, 0.05)

Table 9: Predicted mean expected earnings (log) in preferred major, by treatment conditions and family background status. Column *Low-SES* shows predicted mean expected earnings for low-income and first-generation students; column *High-SES* shows predicted mean expected earnings for neither low-income nor first-generation students. Column *Difference* shows the estimated difference in expected earnings between the two SES groups. Column *CI* reports the 95% confidence interval on the estimated difference. Predictions calculated from regression estimates in Table 8.

Unlike Business and Humanities, the difference for Education is reduced due to the treatment increasing low-SES respondents' earnings expectations more than high-SES respondents' expectations. The predicted difference between family background groups in the No Information condition is 0.1, while the predicted difference in the Median Earnings condition is -0.03 with a 95% confidence interval that overlaps zero.

5.3.2 Choice

We find no evidence for heterogeneous effects of the earnings treatment on major completion probability. Table 10 shows results from the effect of the earnings treatment and interactions with family background on expected major of completion. Conditional on the model covariates, respondents from different family backgrounds have similar major completion probabilities. In the No Information condition, we find no statistically significant difference

in major completion probability between low-income and first-generation respondents and their higher-SES peers. However, three estimates in the row Low Income and First Gen. are positive and substantively large: the estimate is 0.48 for Education, 0.50 for Humanities, and 0.42 for Social Science, suggesting low-SES respondents are more likely to select these majors. The estimates, however, are not statistically significant at the 0.05 level. The estimates for Business, Health, and STEM in the row Low Income and First Gen. are closer to zero and statistically imprecise.

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	−0.04	0.22	0.02	0.04	0.08	0.05
	(0.16)	(0.14)	(0.15)	(0.14)	(0.15)	(0.16)
Low Income or First Gen.	−0.04	0.16	0.14	0.09	0.32	0.12
	(0.21)	(0.19)	(0.20)	(0.18)	(0.20)	(0.21)
Low Income and First Gen.	−0.07	0.48$^{\cdot}$	0.23	0.50	0.42	−0.01
	(0.32)	(0.29)	(0.31)	(0.31)	(0.32)	(0.33)
Gender	0.43***	−0.27*	−0.57***	−0.38***	−0.47***	0.89***
	(0.14)	(0.12)	(0.12)	(0.12)	(0.13)	(0.13)
Age	−0.01	0.00	−0.04**	0.03	0.03	−0.05***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Median Earnings x Low Income or First Gen.	−0.04	−0.20	0.05	−0.09	−0.08	−0.02
	(0.28)	(0.26)	(0.27)	(0.26)	(0.28)	(0.28)
Median Earnings x Low Income and First Gen.	−0.27	−0.57	−0.05	−0.45	−0.54	0.14
	(0.44)	(0.39)	(0.43)	(0.41)	(0.42)	(0.45)
R^2	0.04	0.02	0.06	0.03	0.04	0.08
F-Test p-value	0.79	0.32	0.98	0.49	0.41	0.94
N	2005	2005	2005	2005	2005	2005

$^{***}p < 0.005$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table 10: OLS estimates of expected probability of completion per major on treatment indicator and interaction between treatment indicator and family background status. We exclude senior students from analysis. Regressions also include demographic and academic controls. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.

To help illustrate the interaction effects, we calculate the predicted average log probability of completing a degree in each major by family background status and treatment status. We also calculate the average difference in major completion probability between the treatment groups. These results are presented in Table 11. Similar to the regression estimates, the predicted difference in major choice probability is statistically indistinguishable from zero for both SES groups and in all major fields.

	Predicted Completion			
Major/Treatment Condition	No Information	Median Earnings	Difference	CI
Business/High-SES	-4.63	-4.67	-0.04	(-0.35, 0.28)
Business/Low-SES	-4.71	-5	-0.29	(-2.08, 0.56)
Education/High-SES	-5.18	-4.97	0.21	(-0.06, 0.50)
Education/Low-SES	-4.71	-5.04	-0.33	(-1.02, 0.41)
Health/High-SES	-4.51	-4.5	0.02	(-0.26, 0.31)
Health/Low-SES	-4.31	-4.31	-0.01	(-0.73, 0.8)
Humanities/High-SES	-5.08	-5.04	0.04	(-0.24, 0.33)
Humanities/Low-SES	-4.59	-4.98	-0.4	(-1.11, 0.37)
Social Science/High-SES	-4.35	-4.27	0.08	(-0.21, 0.38)
Social Science/Low-SES	-3.93	-4.38	-0.44	(-1.19, 0.37)
STEM/High-SES	-3.79	-3.75	0.05	(-0.27, 0.33)
STEM/Low-SES	-3.83	-3.61	0.22	(-0.61, 1.05)

Table 11: Predicted mean expected log probability of degree completion, by treatment conditions and SES status. Column *Low-SES* shows predicted mean expected probability for low-income and first-generation students; column *High-SES* shows predicted mean expected probability for neither low-income nor first-generation students. Column *Difference* shows the estimated difference in expected probability between the two treatment groups. Column *CI* reports the 95% confidence interval on the estimated difference.

5.4. Limitations

Given these findings, we note several limitations to this analysis. First, our sample of respondents is from a population already enrolled in college, such that our sample includes respondents who have already selected into college, leaving out of the sample those who did not select into college. The selection problem affects the results when those who have selected into college are more informed about labor market outcomes than those who do not go to college, perhaps due to resources used during the college search or provided by the university itself.

Second, respondents who select into the survey may differ in observable and unobservable characteristics from the university population overall. We show in Table 1 that the sample is generally similar to the overall university population on all observables except gender.[25]

[25]Studies of response and non-response have noted that women are more likely than men to respond during

We cannot assess bias on unobservables. Those who respond, for example, may have greater motivation to take the survey because they are interested in the topic of career choice. This pattern would lead to bias when those who respond have already investigated careers and labor market information, while those who do not respond have not sought out this information.

One of our post-treatment survey questions reveals that the majority of students expressed that the labor market information presented in the survey was useful to them; sixty-two percent of respondents listed the information as "useful" or "very useful," while less than seven percent listed the information as "useless" or "very useless." To the extent that respondents had already sought out labor market information, they may consider our information treatment as not being useful since they have already seen the data elsewhere. These results, as well as responses to open-ended questions in our survey, suggest that many respondents had either not seen the data before or, having seen it, still find use in seeing it again.

Finally, our analysis of the treatment impact on low-income, first-generation status students does not have a causal interpretation. Our experimental design only randomizes the information provided to respondents; we cannot randomize family background. All estimates of interaction effects that we present are associations, not causal effects.

6 Discussion

We ask three research questions in this paper: 1) Does providing students with labor market information about median earnings change their own earnings expectations? 2) Does providing students with labor market information about median earnings change their own expectations about the field of study in which they intend to complete a degree, relative to students who do not see any labor market information? 3) Does the effect of labor market

online surveys taken by the student body (Underwood et al. 2000).

information about median earnings vary systematically by student's socioeconomic status?

We find that showing respondents median earnings alone reduces respondents' own earnings expectations. On average, students respond with expectations closer toward the national median. Consistent with the idea of costly search (Hastings et al. 2015), we find that the information treatment has a larger effect on respondents' expectations in their counterfactual majors. Though the information treatment has a substantively large impact on earnings expectations, we find little evidence of a causal effect on major choice. Other researchers have found a similar pattern (Kerr et al. 2014; Wiswall and Zafar 2015).

The descriptive findings for research question 3 are generally not consistent with a model predicting that low-SES respondents hold more biased or inaccurate beliefs about labor market information. Rather, high-SES respondents in the No Information condition seem to overestimate the amount of money that graduates earn. In Business and Humanities, high-SES respondents who see median earnings information have lower expectations than high-SES respondents who see no labor market information. For Education, however, the pattern is reversed: low-SES respondents who see no information have lower earnings expectations than low-SES respondents who see the median earnings.

Disclosure of labor market information on college graduates has become an area of national focus for at least three reasons. Policymakers and universities are seeking to expand access to higher education and ensure more equitable distribution of students across majors, particularly in STEM fields. National policymakers have also prioritized reducing student college debt, and one aspect of debt reduction is to encourage students to choose academic fields such that they gain skills valued by the labor market. Understanding how information affects the student choice process is crucial to the success of these efforts.

Our work builds on the policy relevance of scholars investigating the effect of publicly available scorecards used to inform students about the returns to college and specific majors (Huntington-Klein 2016a; Hurwitz and Smith 2016). Earnings information changes students'

expectations for their own future earnings, though the disclosure of earnings information changes higher-SES respondents' expectations more than low-SES respondents. However, the evidence that earnings information ultimately changes students' preferences over majors is more limited. These findings therefore add to the body of literature that shows students primarily weigh non-financial factors when making decisions about college major choice.

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A Supplemental Tables Not for Publication

In order to reduce the length of the main manuscript, we have placed several items in the supplementary materials.

A.1. Drop Data Checks

In this section, we analyze differences between respondents who dropped out and those who completed the survey. We focus on differences in several key variables that are likely related to post-graduate labor market expectations: family background, gender, SAT scores, and academic class level. In short, we only find differences between those who complete and those who do not complete when analyzing SAT scores. Those who do not complete the survey are significantly more likely to have a lower SAT score on the math and verbal components, and more likely to have an SAT score missing from the dataset. This finding suggests that those who did take the survey have, on average, higher academic performance on the SAT

A.1.1 Family Background

Family Background	Complete Percent	Non Complete Percent
Base	79	21
Low Income or First Gen.	79	21
Low Income and First Gen.	76	24

Table A1: χ-squared = 2.5239, df = 2, p-value = 0.2831

A.1.2 Gender

Gener	Complete Percent	Non Complete Percent
Female	78	22
Male	80	20

Table A2: χ-squared = 1.7338, df = 1, p-value = 0.1879

A.1.3 SAT

	SAT Math mean	SAT Verbal mean
Complete	608	579
Non Complete	591	564

Table A3: ANOVA for Math SAT, F = 23, $p < 0.01$. ANOVA for Verbal SAT, F = 17, $p < 0.01$.

	0 Percent	1 Percent	0 Percent	1 Percent
Complete	79	21	79	21
Non Complete	74	26	74	26

Table A4: χ-squared = 11.525, df = 1, $p - value < 0.01$. Results the same for both math and verbal SAT missingness.

A.1.4 Class Level

	Complete Percent	Non Complete Percent
First Year	22	20
Junior	26	26
Senior	33	32
Sophomore	19	21

Table A5: χ-squared = 4.3586, df = 4, p-value = 0.36

A.1.5 Family Background

Family Background	Keep Percent	Drop Percent
Base	5	95
First-Gen or Low-Income	5	95
First-Gen and Low-Income	5	95

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	-0.10^{***}	-0.02	-0.08^{***}	-0.06^{***}	-0.06^{***}	-0.08^{***}
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income or First Gen.	-0.07^{***}	-0.03	-0.03	-0.02	-0.01	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income and First Gen.	-0.08^{**}	-0.04	-0.04	-0.04	-0.05	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Gender	0.06^{***}	0.09^{***}	$0.03^{\cdot}$	0.05^{**}	0.02	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.00	0.01^{***}	-0.00	0.01^{***}	0.01^{***}	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Asian	0.00	-0.04	-0.02	-0.10^{**}	-0.18^{***}	-0.05
	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)
Latino	-0.04	-0.05	-0.09^{*}	-0.09^{*}	-0.13^{***}	$-0.06^{\cdot}$
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Unknown	0.05	-0.03	0.05	-0.08	-0.04	-0.01
	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
Multiple Race	-0.04	-0.11^{*}	-0.06	-0.14^{*}	$-0.10^{\cdot}$	-0.04
	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)
Caucasian	-0.02	$-0.06^{\cdot}$	-0.08^{*}	-0.12^{***}	-0.15^{***}	-0.07^{*}
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Sophomore	0.00	-0.02	0.00	$-0.05^{\cdot}$	$-0.05^{\cdot}$	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Junior	0.01	0.00	0.01	-0.04	-0.01	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Senior	0.04	-0.01	0.01	-0.04	-0.04	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Somewhat Likely	0.01	0.02	0.04	0.03	0.03	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Somewhat Unlikely	-0.01	-0.00	-0.04	-0.03	-0.03	-0.02
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Very Likely	0.02	0.02	0.09^{***}	0.01	$0.05^{\cdot}$	0.02
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Very Unlikely	0.02	-0.01	0.06	0.01	0.02	0.05
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)
Campus 1	0.10^{***}	0.00	-0.01	0.00	-0.02	0.06^{*}
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Campus 2	0.18^{***}	$0.06^{\cdot}$	0.04	0.06	0.05	0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Intercept	11.10^{***}	10.61^{***}	11.18^{***}	10.60^{***}	10.72^{***}	11.31^{***}
	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)
R^2	0.04	0.02	0.02	0.02	0.03	0.02
N	2957	2957	2957	2957	2957	2957

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table A6: OLS estimates of expected earnings per major on treatment indicator. Regressions also include family background indicators, and demographic and academic controls. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	-0.09^{***}	-0.04	-0.05	0.08	-0.03	$-0.04^{\cdot}$
	(0.03)	(0.06)	(0.04)	(0.06)	(0.04)	(0.02)
Low Income or First Gen.	-0.05	-0.10	-0.01	0.03	-0.03	-0.04
	(0.03)	(0.07)	(0.05)	(0.07)	(0.04)	(0.03)
Low Income and First Gen.	-0.11^{*}	-0.29^{*}	-0.00	0.05	-0.04	-0.03
	(0.05)	(0.11)	(0.06)	(0.08)	(0.06)	(0.04)
Gender	0.07^{**}	0.07	0.11^{*}	0.06	-0.03	0.07^{***}
	(0.03)	(0.08)	(0.05)	(0.06)	(0.05)	(0.02)
Age	-0.00	0.01	0.00	0.00	0.01	-0.01
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Asian	0.02	-0.20	-0.02	-0.06	-0.07	-0.09^{*}
	(0.06)	(0.15)	(0.07)	(0.11)	(0.09)	(0.04)
Latino	-0.01	-0.09	-0.00	-0.09	-0.05	$-0.09^{\cdot}$
	(0.06)	(0.16)	(0.07)	(0.11)	(0.07)	(0.05)
Unknown	0.04	0.05	-0.03	-0.06	0.06	0.07
	(0.09)	(0.30)	(0.08)	(0.17)	(0.13)	(0.07)
Multiple Race	-0.04	-0.15	0.00	-0.12	-0.03	-0.05
	(0.10)	(0.14)	(0.11)	(0.15)	(0.11)	(0.06)
Caucasian	0.01	-0.04	-0.07	-0.05	0.02	-0.12^{**}
	(0.05)	(0.14)	(0.06)	(0.10)	(0.07)	(0.04)
Sophomore	0.03	-0.02	-0.02	-0.03	-0.23^{***}	0.05
	(0.04)	(0.08)	(0.07)	(0.11)	(0.07)	(0.03)
Junior	0.01	0.07	-0.06	-0.06	-0.16^{*}	0.01
	(0.04)	(0.09)	(0.06)	(0.10)	(0.07)	(0.03)
Senior	0.06	0.03	-0.08	-0.14	-0.28^{***}	-0.01
	(0.04)	(0.10)	(0.06)	(0.10)	(0.07)	(0.03)
Somewhat Likely	$0.06^{\cdot}$	-0.08	0.00	0.09	0.09	0.00
	(0.04)	(0.11)	(0.09)	(0.09)	(0.07)	(0.03)
Somewhat Unlikely	-0.04	-0.19	-0.01	0.02	0.00	-0.01
	(0.04)	(0.17)	(0.12)	(0.11)	(0.09)	(0.05)
Very Likely	$0.07^{\cdot}$	0.05	0.08	0.19^{*}	$0.13^{\cdot}$	0.03
	(0.04)	(0.11)	(0.09)	(0.08)	(0.07)	(0.03)
Very Unlikely	0.09	-0.14	-0.03	0.20	0.20	0.03
	(0.06)	(0.15)	(0.14)	(0.13)	(0.12)	(0.05)
Campus 1	0.03	-0.08	0.01	0.04	-0.12^{*}	0.01
	(0.05)	(0.09)	(0.04)	(0.09)	(0.06)	(0.05)
Campus 2	0.11^{*}	0.16	0.06	0.11	0.03	0.08
	(0.05)	(0.13)	(0.07)	(0.12)	(0.07)	(0.06)
R^2	0.06	0.12	0.04	0.05	0.08	0.04
N	739	252	486	326	544	1073

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table A7: OLS estimates of expected earnings per major on treatment indicator. Regressions also include family background indicators, and demographic and academic controls. Sample limited to responses about preferred major. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni method correction.

A.2. Regression Tables

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	-0.10^{***}	-0.02	-0.09^{***}	-0.08^{***}	-0.06^{***}	-0.10^{***}
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income or First Gen.	-0.08^{***}	-0.02	-0.03	-0.03	-0.02	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Low Income and First Gen.	$-0.06^{\cdot}$	-0.01	-0.06	-0.05	-0.06	0.03
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Gender	$0.04^{\cdot}$	0.09^{***}	0.04^{*}	0.06^{**}	0.04^{*}	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Age	0.00	0.01^{***}	0.00	0.01^{***}	0.01^{***}	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Asian	-0.02	-0.02	-0.03	-0.10^{**}	-0.18^{***}	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Latino	-0.06	-0.05	-0.10^{*}	-0.10^{*}	-0.16^{***}	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Unknown	0.04	-0.05	0.06	-0.09	-0.07	-0.06
	(0.06)	(0.07)	(0.08)	(0.08)	(0.08)	(0.09)
Multiple Race	-0.04	$-0.11^{\cdot}$	-0.07	-0.15^{*}	-0.12^{*}	-0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Caucasian	-0.03	$-0.07^{\cdot}$	-0.08^{*}	-0.12^{***}	-0.21^{***}	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Sophomore	-0.01	-0.03	0.02	$-0.06^{\cdot}$	-0.04	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Junior	0.01	-0.00	0.02	-0.04	-0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Senior	0.04	-0.01	0.03	-0.04	-0.02	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Somewhat Likely	-0.02	0.03	0.03	0.02	0.01	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Somewhat Unlikely	0.01	0.01	-0.04	-0.04	-0.04	-0.03
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
Very Likely	0.02	0.01	0.07^{*}	-0.02	0.03	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Very Unlikely	-0.00	0.01	0.06	-0.02	-0.01	0.06
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Campus 1	0.14^{***}	0.01	0.02	-0.00	0.01	0.07^{*}
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Campus 2	0.18^{***}	0.05	0.06	0.05	0.05	0.05
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
R^2	0.04	0.02	0.02	0.03	0.03	0.02
N	2218	2705	2471	2631	2413	1884

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table A8: OLS estimates of expected earnings per major on treatment indicator. Regressions also include family background indicators, and demographic and academic controls. Sample limited to responses about counterfactual majors. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.

	Business	Education	Health	Humanities	Social Science	STEM
Median Earnings	−0.08	0.11	0.03	−0.03	0.01	0.06
	(0.13)	(0.11)	(0.12)	(0.11)	(0.12)	(0.13)
Low Income or First Gen.	−0.06	0.07	0.17	0.04	0.28$^{\cdot}$	0.11
	(0.15)	(0.13)	(0.14)	(0.13)	(0.14)	(0.15)
Low Income and First Gen.	−0.21	0.19	0.20	0.26	0.14	0.06
	(0.23)	(0.21)	(0.23)	(0.22)	(0.22)	(0.24)
Gender	0.43***	−0.27*	−0.57***	−0.37***	−0.47***	0.88***
	(0.14)	(0.12)	(0.12)	(0.12)	(0.13)	(0.13)
Age	−0.01	0.00	−0.04**	0.03	0.03	−0.05***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.48*	−0.61***	0.07	−0.62***	−1.17***	0.62**
	(0.23)	(0.21)	(0.23)	(0.21)	(0.22)	(0.23)
Latino	0.15	0.04	−0.24	0.17	−0.47*	0.12
	(0.24)	(0.22)	(0.23)	(0.23)	(0.24)	(0.24)
Unknown	0.34	−0.44	−0.15	0.54	−0.14	0.28
	(0.42)	(0.39)	(0.42)	(0.42)	(0.42)	(0.47)
Multiple Race	0.01	−0.01	−0.37	0.07	−0.05	0.13
	(0.37)	(0.34)	(0.37)	(0.35)	(0.37)	(0.37)
Caucasian	−0.02	−0.28	−0.53*	−0.40*	−0.48*	−0.31
	(0.21)	(0.20)	(0.21)	(0.20)	(0.21)	(0.22)
Sophomore	−0.12	−0.02	−0.34*	−0.03	0.17	−0.70***
	(0.17)	(0.15)	(0.16)	(0.15)	(0.16)	(0.17)
Junior	−0.23	−0.18	−0.28$^{\cdot}$	−0.28$^{\cdot}$	0.06	−0.65***
	(0.16)	(0.14)	(0.16)	(0.15)	(0.15)	(0.16)
Somewhat Likely	0.22	0.14	0.19	0.06	0.00	−0.02
	(0.22)	(0.18)	(0.19)	(0.19)	(0.20)	(0.20)
Somewhat Unlikely	0.13	−0.03	0.06	−0.04	−0.28	0.10
	(0.29)	(0.25)	(0.25)	(0.27)	(0.27)	(0.27)
Very Likely	−0.70***	0.00	0.63***	−0.29	−0.26	0.27
	(0.20)	(0.17)	(0.18)	(0.18)	(0.19)	(0.19)
Very Unlikely	−0.26	0.17	0.03	0.07	−0.54$^{\cdot}$	0.56
	(0.35)	(0.29)	(0.29)	(0.31)	(0.31)	(0.34)
Campus 1	−0.24	−0.33$^{\cdot}$	−1.00***	0.30$^{\cdot}$	0.05	0.68***
	(0.20)	(0.18)	(0.20)	(0.18)	(0.19)	(0.19)
Campus 2	0.55*	0.08	−0.75***	0.36	0.32	0.08
	(0.25)	(0.23)	(0.25)	(0.23)	(0.24)	(0.24)
R^2	0.04	0.02	0.06	0.03	0.04	0.08
N	2005	2005	2005	2005	2005	2005

$^{***}p < 0.005$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table A9: OLS estimates of expected probability of completion per major on treatment indicator. Sample excludes senior respondents. Regressions also include family background indicators, and demographic and academic controls. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.

	Business	Education	Health	Humanities	Social Science	STEM
Intercept	11.10***	10.61***	11.17***	10.60***	10.72***	11.31***
	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)
Median Earnings	−0.11***	−0.04*	−0.07***	−0.08***	−0.07***	−0.08***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Low Income or First Gen.	−0.07*	−0.04	−0.01	−0.05	−0.02	−0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Low Income and First Gen.	−0.12***	−0.10*	−0.03	−0.09*	−0.06	−0.01
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
Gender	0.06***	0.09***	0.03·	0.06**	0.02	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.00	0.01***	−0.00	0.01***	0.01***	−0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Asian	0.00	−0.04	−0.02	−0.11**	−0.18***	−0.05·
	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)
Latino	−0.05	−0.05	−0.09*	−0.09*	−0.13***	−0.06·
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Unknown	0.05	−0.03	0.05	−0.08	−0.04	−0.01
	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
Multiple Race	−0.04	−0.11*	−0.06	−0.14*	−0.10·	−0.04
	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)
Caucasian	−0.02	−0.06·	−0.08*	−0.12***	−0.15***	−0.07*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Sophomore	0.00	−0.02	0.00	−0.05·	−0.05·	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Junior	0.01	0.00	0.01	−0.04	−0.01	−0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Senior	0.04	−0.00	0.01	−0.04	−0.04	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Somewhat Likely	0.00	0.02	0.04	0.03	0.03	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Somewhat Unlikely	−0.01	−0.01	−0.04	−0.03	−0.03	−0.02
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Very Likely	0.02	0.02	0.09***	0.01	0.05·	0.02
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Very Unlikely	0.02	−0.01	0.06	0.01	0.02	0.05
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)
Campus 1	0.10***	0.01	−0.01	0.01	−0.01	0.06*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Campus 2	0.18***	0.07·	0.04	0.06	0.05	0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Median Earnings x Low Income or First Gen.	−0.01	0.03	−0.04	0.05	0.02	−0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Median Earnings x Low Income and First Gen.	0.09	0.12*	−0.04	0.11·	0.02	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)
R^2	0.04	0.02	0.02	0.02	0.03	0.02
F-Test p-value	0.22	0.10	0.59	0.17	0.90	0.55
N	2957	2957	2957	2957	2957	2957

$^{***}p < 0.0042$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table A10: OLS estimates of expected earnings per major on treatment indicator, family background indicators, interactions between treatment and family background indicators, and demographic and academic controls, for respondents in their counterfactual major. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni method correction.

	Business	Education	Health	Humanities	Social Science	STEM
Intercept	-3.14^{***}	-4.43^{***}	-2.44^{***}	-4.95^{***}	-4.33^{***}	-2.77^{***}
	(0.53)	(0.46)	(0.48)	(0.48)	(0.52)	(0.50)
Median Earnings	-0.04	0.22	0.02	0.04	0.08	0.05
	(0.16)	(0.14)	(0.15)	(0.14)	(0.15)	(0.16)
Low Income or First Gen.	-0.04	0.16	0.14	0.09	0.32	0.12
	(0.21)	(0.19)	(0.20)	(0.18)	(0.20)	(0.21)
Low Income and First Gen.	-0.07	$0.48^{\cdot}$	0.23	0.50	0.42	-0.01
	(0.32)	(0.29)	(0.31)	(0.31)	(0.32)	(0.33)
Gender	0.43^{***}	-0.27^{*}	-0.57^{***}	-0.38^{***}	-0.47^{***}	0.89^{***}
	(0.14)	(0.12)	(0.12)	(0.12)	(0.13)	(0.13)
Age	-0.01	0.00	-0.04^{**}	0.03	0.03	-0.05^{***}
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.48^{*}	-0.60^{***}	0.07	-0.62^{***}	-1.16^{***}	0.62^{**}
	(0.23)	(0.21)	(0.23)	(0.21)	(0.22)	(0.23)
Latino	0.15	0.04	-0.24	0.17	-0.47^{*}	0.12
	(0.24)	(0.22)	(0.23)	(0.23)	(0.24)	(0.24)
Unknown	0.34	-0.45	-0.15	0.53	-0.15	0.28
	(0.42)	(0.39)	(0.42)	(0.42)	(0.42)	(0.47)
Multiple Race	0.01	-0.01	-0.37	0.08	-0.05	0.13
	(0.37)	(0.34)	(0.37)	(0.35)	(0.37)	(0.37)
Caucasian	-0.02	-0.27	-0.53^{*}	$-0.39^{\cdot}$	-0.48^{*}	-0.31
	(0.21)	(0.20)	(0.21)	(0.20)	(0.21)	(0.22)
Sophomore	-0.12	-0.02	-0.34^{*}	-0.03	0.17	-0.70^{***}
	(0.17)	(0.15)	(0.16)	(0.15)	(0.16)	(0.17)
Junior	-0.23	-0.19	$-0.28^{\cdot}$	$-0.28^{\cdot}$	0.05	-0.65^{***}
	(0.16)	(0.14)	(0.16)	(0.15)	(0.16)	(0.16)
Somewhat Likely	0.22	0.14	0.19	0.06	0.00	-0.02
	(0.22)	(0.18)	(0.19)	(0.19)	(0.20)	(0.20)
Somewhat Unlikely	0.13	-0.03	0.06	-0.04	-0.28	0.10
	(0.29)	(0.25)	(0.25)	(0.27)	(0.27)	(0.27)
Very Likely	-0.70^{***}	0.00	0.63^{***}	-0.29	-0.26	0.27
	(0.20)	(0.17)	(0.18)	(0.18)	(0.19)	(0.19)
Very Unlikely	-0.26	0.17	0.03	0.07	$-0.54^{\cdot}$	0.56
	(0.35)	(0.29)	(0.29)	(0.31)	(0.31)	(0.34)
Campus 1	-0.25	$-0.34^{\cdot}$	-1.00^{***}	$0.29^{\cdot}$	0.05	0.69^{***}
	(0.20)	(0.18)	(0.20)	(0.18)	(0.19)	(0.19)
Campus 2	0.55^{*}	0.07	-0.75^{***}	0.35	0.30	0.08
	(0.25)	(0.23)	(0.25)	(0.23)	(0.24)	(0.24)
Median Earnings x Low Income or First Gen.	-0.04	-0.20	0.05	-0.09	-0.08	-0.02
	(0.28)	(0.26)	(0.27)	(0.26)	(0.28)	(0.28)
Median Earnings x Low Income and First Gen.	-0.27	-0.57	-0.05	-0.45	-0.54	0.14
	(0.44)	(0.39)	(0.43)	(0.41)	(0.42)	(0.45)
R^2	0.04	0.02	0.06	0.03	0.04	0.08
F-Test p-value	0.79	0.32	0.98	0.49	0.41	0.94
N	2005	2005	2005	2005	2005	2005

$^{***}p < 0.005$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table A11: OLS estimates of expected probability of completion per major on treatment indicator and interaction between treatment indicator and family background status. We exclude senior students from analysis. Regressions also include demographic and academic controls. Robust standard errors in parentheses. Three stars indicate statistical significance at the level determined by the Bonferroni correction.