Anticipated Gender Discrimination and College Major Choice

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Abstract

We study whether gender differences in university major choices result from anticipated labor market discrimination. First, we document two novel facts using administrative transcript records from a large Midwestern university: women are less likely to study STEM, but 1) those who do are positively selected on ability and 2) obtain higher grades conditional on ability. Second, we show that these facts are consistent with a signaling model in which women anticipate labor market discrimination in STEM. Third, we directly investigate anticipated discrimination using a student survey. The survey reveals striking patterns of anticipated discrimination by women, particularly in STEM, business, and economics, affecting both expected economic outcomes such as wages as well as workplace conditions. Anticipated discrimination predicts women's course and intended major choices, but not men's.

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Substantial gender inequality persists in the labor market (Goldin, 2014; Blau and Kahn, 2017). A large share of it is often ascribed to two factors: (1) women sort into lower-paying occupations than men,[1] and (2) in at least some occupations, women face labor market discrimination.[2] While these two explanations have each received substantial attention in the literature, they are often treated as distinct, mutually-exclusive alternatives. Discrimination is often considered a "demand-side" explanation, while sorting is often considered a "supply-side" explanation, for example arising from gender differences in preferences or constraints. In this paper, we show that the two are in fact directly linked: women's sorting partly reflects anticipated discrimination in certain occupations.

In particular, we study how anticipated gender discrimination influences college major choice. Women are well-known to be underrepresented in STEM fields, which typically lead to higher-paying jobs. They are also particularly likely to face labor market discrimination in those fields, indicating that the two could be related. Since labor market outcomes depend heavily on pre-market investments like education, if women anticipate discrimination in STEM fields, they could be deterred from pursuing these majors, in turn driving differential sorting and inequality in the labor market. Despite this intuitive connection, no empirical evidence explicitly links labor market discrimination to college major choices (Patnaik, Wiswall and Zafar, 2020).

We proceed to fill the gap in three steps. First, we document novel empirical facts using administrative transcript records from a large selective public university in the Midwest. Second, we show that these facts are consistent with a theoretical framework in which women anticipate (more) labor market discrimination if they graduate in STEM/BE fields. Third, we present direct evidence of anticipated discrimination using a survey of first- and-second year students at the university. The survey allows us to test key features of the theoretical framework and to test whether anticipated discrimination predicts student behavior.

In the transcript analysis, we study differences in major choice and achievement, namely

[1] Proposed explanations for gender gaps in college major choice and occupational sorting include (subjective) earnings expectations, confidence and competitiveness, preferences for non-wage amenities, and a lack of representation. See Niederle and Vesterlund (2007); Fernandez and Friedrich (2011); Zafar (2013); Pan (2015); Wiswall and Zafar (2021).

[2] See Goldin and Rouse (2000); Bertrand and Duflo (2017); Sarsons (2017), and Benson, Li and Shue (2024) for gender discrimination and Reuben, Sapienza and Zingales (2014); Bohren, Imas and Rosenberg (2019); Kessler, Low and Sullivan (2019); Kessler, Low and Shan (2023); Exley et al. (2024) for discrimination in STEM fields.

grades, between men and women. We document that women are underrepresented in STEM, business, and economics (STEM/BE), but substantially less-so among high-ability students.[3] Further, conditional on majoring in STEM/BE, women obtain higher grades throughout the ability distribution, but the difference is again smaller near the top. Notably, this grade advantage grows in STEM/BE relative to other majors after students declare their major, suggesting that major choice partly drives the pattern.

Our theoretical framework builds on a standard model of signaling and statistical discrimination (Lang and Manove, 2011). Students decide how much to invest into an observable signal of ability (i.e., grades) and in which major to invest. Our first primary assumption is that one group of students (women) anticipates facing more labor market discrimination if they study in one category of majors (STEM/BE) than another. We then show that discrimination can distort women's incentives to invest in those majors, affecting both major selection and grades. In particular, anticipated discrimination incentivizes investments into signaling, such that women in STEM/BE obtain higher grades conditional on ability. Furthermore, since investment is costly, they are less likely to select a STEM/BE major in the first place. Our second assumption is that discrimination is anticipated to decrease with ability/investment. Then, we show that the distortionary effects of discrimination are concentrated in lower parts of the ability distribution, consistent with patterns documented in the transcript analysis.

Our student survey includes a vignette experiment eliciting beliefs about hypothetical students and a counterfactual choice experiment eliciting respondents' own expectations about graduating in different majors. The survey uncovers stark patterns of anticipated discrimination, reported almost exclusively by women, particularly in STEM/BE. It also allows us to link students' subjective beliefs about anticipated discrimination to their education choices.

In the vignette experiment, respondents were less likely to recommend STEM/BE for female students, perceiving these fields as harder for women to have a successful career in, even controlling for interest and ability. These differences arise before introducing discrimination or gender inequality in the survey. When asked to explain their recommendation through an open-ended question, many referred to some notion of discrimination towards women in STEM/BE, again without prompt or priming about gender or discrimination. Af-

[3]We proxy ability using standardized college entry test scores, taken as a measure of capacity and preparedness which should be taken as given by students at the time of choosing their major.

terwards, directly inquiring about expectations of discrimination confirms that women are anticipated to face labor market discrimination, particularly in STEM/BE, while men are not anticipated to face nearly as much discrimination in either major category. These findings directly support the first assumption from our theoretical framework: one group (women) is anticipated to face discrimination particularly in one category of majors (STEM/BE). We then document that women, in particular high-ability ones, are expected to be able to overcome some discrimination they will face through hard work and excelling, though substantial anticipated discrimination remains across the ability distribution. These findings are consistent with our framework's second assumption: anticipated discrimination decreases with investment/ability.

In the counterfactual choice experiment, we document that women expect some discrimination during their study, but more in the labor market, especially in STEM/BE. They anticipate discrimination in the form of classical economic outcomes, namely lower pay and fewer job offers compared to equally-qualified candidates, with average expected gaps of 10% in pay and hiring likelihood for STEM/BE jobs. They also expect to face worse workplace conditions in STEM/BE, including underestimation of their competence, hostility, and sexual harassment. These concerns are weaker in other fields but remain substantial, painting a bleak picture of the workplace conditions women expect to face. In contrast, men anticipate facing little discrimination across the board.

Using our survey measures combined with the transcript data, we show that anticipated discrimination predicts women's intended major choice and course taking. A one standard-deviation increase in anticipated discrimination decreases the likelihood of women intending to choose STEM/BE by about 9 percentage points, controlling for differences in interest, ability, and other perceived differences between STEM/BE and other fields. In contrast, men's intended major choices are unaffected by anticipated discrimination. Overall, controlling for differences in anticipated discrimination across men and women closes 20-30% of the gender gap in STEM/BE, almost double the impact of controlling for differences in interest and ability. We also find that a one standard-deviation increase in anticipated discrimination is associated with a 10% lower share of STEM/BE courses taken by women in their first term, with again little impact for men.

Discussions of gender discrimination in the labor market are widespread in both public[4]

[4]See Gould, Schieder and Geier (2016) and Hill (2017) for examples of popular discourse on the gender

and academic discourse. It is thus unsurprising that students are exposed to these concerns - over two-thirds of women in our survey report exposure to information suggesting STEM/BE may be less suitable or more challenging because of their gender. Yet, this paper is the first to explicitly document how women internalize such concerns and account for them when making high-stakes decisions (while men do not). Our findings contribute to growing evidence that uncertainty and subjective expectations influence education decisions and economic inequality (Patnaik, Wiswall and Zafar, 2020).

This paper contributes primarily to the literature on discrimination, education, and gender inequality. Theoretical work often posits that agents are aware of and adapt to future discrimination they will face (Arrow, 1973; Lundberg and Startz, 1983; Coate and Loury, 1993). Empirical tests are scarce, because they typically require data linking pre-market investments to (expectations of) labor market discrimination. Some studies on race provide indirect evidence that schooling and wage patterns align with anticipated discrimination (Lang and Manove, 2011; Batistich et al., 2022). Other evidence largely comes from the lab, documenting that individuals alter their behavior when facing potential discrimination (Zussman, 2013; Alston, 2019; Charness et al., 2020; Exley and Kessler, 2022; Gagnon, Bosmans and Riedl, 2022; Kudashvili and Lergetporer, 2022). We instead measure subjective beliefs about anticipated discrimination and relate them to real, high-stakes education decisions. To our knowledge, only Ugalde (2022) and Exley et al. (2024) follow a similar approach, providing evidence that concerns of discrimination influence how women perceive and respond to their grades. In contrast, we focus on anticipated discrimination and differences in major choice, a key determinant of gender inequality.

We contribute to the education literature by examining a rarely explored factor behind gender disparities in educational outcomes: anticipated discrimination. We provide direct evidence that students consider expected labor market outcomes when making educational decisions, with women and men expecting different prospects, leading to different choices. Our results provide an explanation for why women who appear qualified and interested in STEM/BE fields may not pursue a career in those fields at various stages of the process if they experience or anticipate discrimination, contributing to the "leaky pipeline" of women in STEM/BE fields. By overlooking expectations of discrimination, prior work may overstate

pay gap and discrimination against women. Surveys also report high rates of workplace discrimination experienced by women (Funk and Parker, 2018; Pew Research Center, 2018).

the importance of preferences versus (perceived) opportunities in driving gender differences in education choices (Zafar, 2013; Wiswall and Zafar, 2018). Recent work documents that students value educational and career satisfaction when selecting fields, contributing to the under-representation of women in traditionally male-dominated fields (Hansen et al., 2024). Our findings highlight that this likely arises in part because women expect discrimination in those fields, both in university and the workplace. They also align with evidence that individuals attempt to sort in order to avoid hostility and harassment in the workplace and are willing to pay to avoid these negative workplace conditions (Fortin, Lemieux and Rehavi, 2021; Folke and Rickne, 2022; Collis and Van Effenterre, 2024).

Our findings have important implications for understanding gender inequality. They show that the range of decisions and outcomes distorted by discrimination is broader than often considered.[5] By acting as a barrier to women's entry in certain fields, discrimination contributes to the misallocation of talent in the economy (Ashraf et al., 2024; Lubczyk and Moser, 2024). We show that discrimination also affects which women enter certain fields, namely creating positive selection of women in STEM. Whether men and women appear evenly balanced in terms of productivity-relevant characteristics is often used as a test of bias, for example regarding an employer's hiring and promotion decisions (e.g. the Becker outcomes test). Our results indicate that the presence of more qualified women in certain fields or at certain firms may in fact not arise from contemporaneous biased decisions of employers, but sorting of women based on the anticipation of bias, prior to market entry.

Moreover, while the gender wage gap shrinks substantially when controlling for field of study or occupation, the validity of these controls hinges on why men and women select different fields in the first place.[6] This paper makes clear that field choices and grades are endogenous to discrimination, relating to a literature on inequality and "bad" controls (Neal and Johnson, 1996; Neal, 2004; Lang and Manove, 2011; Carlana, 2019).

[5]Similarly, research on bargaining and negotiating documents that gender disparities arise in part from women anticipating backlash. See Recalde and Vesterlund (2022) for a review.

[6]Previous work has argued that differences in education fields could constitute both a cause and a consequence of gender inequality, if they arise from norms or stereotypes (Bertrand, 2020).

1 Analysis of Administrative Records

1.1 Data

We analyze administrative transcript records for 39,650 undergraduate students first enrolled between fall 2013 and fall 2020 at a large, 4-year Midwestern public university. In fall 2020, the university had slightly over 30,000 on-campus undergraduates, 50.4% of whom were female. Students admitted in that year, on average, had a 3.9 high school GPA and a 1,430 SAT score. The data consist of student-term transcripts (grades, courses, declared majors) and admission information (residency, standardized test scores, and demographics). Column 1 of Table 1 presents summary statistics on the student population.

The transcript data reveal that around 20% of students first declare a major in their first year, 40% in their second, and 90% by the end of their third. Students may then switch majors without a fixed deadline, but we focus on the final major declared (i.e., the graduation major), since we are interested in labor market expectations related to graduating with a given major.

For consistency with the survey, we categorize majors into two broad groups: STEM, business, and economics (STEM/BE) and all other majors (non-STEM/BE), namely humanities and other social sciences. These groups account for 58% and 42% of total enrollment, respectively. Gender composition differs substantially: women comprise 41% of STEM/BE majors and 68% of non-STEM/BE majors. While gender distribution varies across individual majors within those categories, this dichotomy is useful to keep the survey parsimonious and captures salient gender and labor market implications. These categories were also validated in prior research for their meaningful gender associations (Exley et al., 2024). In the transcript analysis below, we investigate the robustness of our results to alternative categorizations.

Our analysis examines gender differences in major choice and academic achievement over the ability distribution. We use standardized college entry test scores (SAT/ACT) as a proxy for ability, reflecting skill and preparedness at college entry. These test scores were mandatory for admission during the study period. We do not assume that they necessarily capture a student's true underlying ability in the absence of potential biases or earlier-stage discrimination (Cvencek, Meltzoff and Greenwald, 2011), but they serve as a pre-determined skill measure at the time when students choose a major.[7]

[7]The scores are also plausibly known privately by students and not available to employers, consistent

1.2 Empirical facts

We examine gender differences in the likelihood of majoring in STEM/BE versus non-STEM/BE over the ability distribution in panel (a) of Figure 1. We characterize ability using deciles of overall standardized test scores, but results are similar when using math test scores (Figure A1).[8] Negative values throughout indicate that women are less likely than men to major in STEM/BE, consistent with prior evidence.[9]

On average, the share of men graduating in STEM/BE is 40–45 percentage points higher than for women. However, the "missing mass" of women is unevenly distributed across ability. The gender gap is narrower (around 35 percentage points) in the top quartile and widens to 60 percentage points in the bottom quartile. The gap is largest in the second-fourth deciles. Interestingly, the gap is smaller in the first decile, which we omit from the fitted line due to implications of the model discussed in the next section.

Next, we compare gender differences in university grades over the ability distribution in panel (b). Women earn higher average grades in both STEM/BE and non-STEM/BE, across the entire ability distribution. In STEM/BE, there is evidence of an ability gradient, with grade differences being smallest at the top of the ability distribution. In contrast, there is little evidence of a gradient for non-STEM/BE.

The first two panels of Figure 1 suggest that women in the lower ability ranges are especially less likely to major in STEM/BE, but those who do are particularly likely to obtain higher grades relative to men of similar ability. To isolate whether these differences appear influenced by major choice, we examine their evolution before and after students declare their major. Consistent with major choice playing a role, panel (c) shows that after declaring a major, women's grade advantage grows sharply in STEM/BE but shrinks in non-STEM/BE. Appendix Table A1 shows that these patterns are robust to including controls for the timing of major declaration, major fixed effects, and restricting the analysis to a major's core courses.

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with the notion of ability in the model outlined in section 2.

[8] ACT scores were converted to SAT-equivalent scores for comparability. For students reporting both SAT and ACT scores, we use the average of the SAT and (converted) ACT scores.

[9] Appendix Figure A2 shows that the relative likelihood of choosing STEM/BE increases with ability for men and women, but more steeply for women. Figure A3 shows that the pattern is broadly robust to omitting female-dominated STEM majors, omitting business and economics from STEM/BE, and omitting engineering which requires applying to a different school within the university.

To summarize, we document the following two empirical results:

Result 1. *Women are underrepresented in STEM/BE, particularly in the lower portions of the ability distribution.*

Result 2. *Women in STEM/BE achieve higher grades than men of the same ability, with larger differences in the lower portions of the ability distribution.*

Next, we show that a simple model of statistical discrimination can generate these empirical facts. Of course, there could be other factors driving these patterns. In Section 3, we will present findings from a student survey that corroborate key elements of the model, lending further credence to our hypothesis that anticipated discrimination is a driver of gender gaps in major choice.

2 Model of college major choice and anticipated discrimination

We present a model in which students choose a major and a major-specific level of investment into signaling their ability through grades. The model is similar to Lang and Manove (2011), which studies the decision to invest into education to signal ability across race. We instead study major choice across gender and introduce a second dimension beyond signaling: sorting. That is, anticipated discrimination in the labor market may not only distort how much students invest into signaling, but also what they major in.

2.1 Baseline model

Students have ability a drawn from $[\underline{a}, \overline{a}]$ and preference for major O, t_O drawn from $[\underline{t}, \overline{t}]$. This preference reflects factors unrelated to ability or productivity, such as interest in the major's content. Both a and t are privately observed by students and independently drawn. Students choose one of two majors denoted by $\{0, 1\}$ and a level of investment $i = I(a)$, representing effort toward grades, which for now is assumed to be non-major-specific. A student's investment cost is $c(a, i) > 0$ and twice continuously differentiable.[10]

[10] We assume $c_i(a,i) > 0$, $c_a(a,i) < 0$, $c_{ia}(a,i) < 0$, $c_{aa}(a,i) < 0$, and $c_{ii}(a,i) > 0$.

The choice of major does not directly affect productivity in the labor market, but the level of investment does.[11] Worker productivity P follows a normal distribution:

$$f(a,i) + \varepsilon \text{ with } \varepsilon \sim N(0, \sigma_\varepsilon^2).$$

Employers observe i and a noisy signal of productivity $s = P + \mu$ with $\mu \sim N(0, \sigma_\mu^2)$.[12] Workers have no outside option and we focus on separating equilibria, such that employers can infer a worker's ability from observing their investment. As in Lang and Manove (2011), we assume that neither the worker nor the employer can perfectly deduce productivity from ability and investment. Productivity also depends on a random element (match-specific), implying that expected productivity increases in a and i, but that firms still always put nonzero weight on s in their assessment of a worker.

From an employer's perspective, a worker's expected productivity is:

$$E_{\mu,\varepsilon}[P|i,s] = \gamma f(a,i) + (1-\gamma)\hat{f}(i),$$

where $\hat{f}(i) = f(A(i), i)$ is the equilibrium inference of an employer about $f(a,i)$ after observing i with $I^{-1}(i) = A(i)$ and $\gamma = \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_\mu^2}$ is the weight employers attach to signal s.

A worker chooses investment i to maximize $[E_{\mu,\varepsilon}[P|i,s] - c(a,i)]$. Our setup accommodates various outcomes of interest for workers, such as wages or hiring likelihood, that increase with expected productivity. Deriving the first-order condition under the equilibrium assumptions $\hat{f}(i) = f(a,i)$ and $A(i) = a$ yields:

$$f_i(a,i) + (1-\gamma) f_a(a,i) A'(i) = c_i(a,i). \tag{1}$$

Equation (1) characterizes the optimal investment $I^*(a)$. In equilibrium, $I^*(\underline{a})$ must be

[11] We assume that the return to productivity (e.g. salary) and investment cost (e.g. course difficulty) are the same across the two majors. Since we are interested in gender differences, this simplification has no impact on predictions unless returns or costs differ by gender, which we discuss in the next subsection.

[12] We assume $f(\cdot)$ is twice continuously differentiable, with $f_a(a,i) > 0$, $f_i(a,i) > 0$, $f_{aa}(a,i) < 0$, $f_{ii}(a,i) < 0$, and $f_{ia}(a,i) > 0$.

efficient and unaffected by signaling, satisfying $f_i(a,i) = c_i(a,i)$. Since $(1-\gamma)f_a(a,i)A'(i) \geq 0$ and given continuity and concavity conditions on $f(\cdot)$ and $c(\cdot)$, all other ability types invest more than $\underline{a}$ and $I^*(a)$ is strictly increasing in a.

Given $I^*(a)$, students select major 0 if and only if:

$$E_{\mu,\varepsilon}[P|I^*,s] - c(a,I^*) + t_0 > E_{\mu,\varepsilon}[P|I^*,s] - c(a,I^*) + t_1. \tag{2}$$

Since $I^*(a)$ does not vary across majors thus far, students simply select major 0 when $t_0 > t_1$.

2.2 Labor market discrimination

Now suppose students belong to one of two groups $g = \{M, F\}$. Both groups have the same ability distribution and preferences.[13] We now assume that group anticipates F facing discrimination in major $O = 0$ while neither group anticipates facing discrimination in major $O = 1$. Conceptually, all that is needed for discrimination to distort behavior is that it is anticipated, whether accurately or not. We can thus test some of the model's assumptions using the survey in the next section. Still, in the model, we assume that expectations regarding labor market discrimination are rational to keep derivations tractable - a signaling model incorporating uncertainty about signal inference is beyond the scope of this paper.

Testable Assumption 1. *Group F anticipates facing (more) labor market discrimination in one major than another and more discrimination than group M in that major.*

There are several potential ways to introduce discrimination in the model. Since our focus is on documenting the existence of anticipated discrimination and its impact on behavior, rather than studying the underlying causes of discrimination in the labor market, we follow the standard approach in the statistical discrimination literature by introducing it through employers observing noisier productivity signals for group F than for group M in major 0. Formally, $\sigma^2_{\mu,F,0} \geq \sigma^2_{\mu,M,0}$ leading to $\gamma_{F,0}(i) \leq \gamma_{M,0}(i)$. This is motivated by women's

[13] Differences in ability across majors, such as those arising before college, could explain group differences in major choice. Yet, they would not generate differences conditional on ability, leaving model predictions largely unchanged.

underrepresentation in STEM fields, which may limit employers' familiarity with assessing female candidates. It implies that employers put less weight on their direct signal and more weight on inferred ability from the investment decision for group F, incentivizing the group to invest more into signaling.[14] As shown below, Assumption 1 is sufficient to generate part of our two empirical results, namely that group F is underrepresented in one major (i.e. STEM/BE) and that group F invests more (e.g. obtains higher grades) than group M when they do select that major, holding ability constant.

To introduce scope for anticipated discrimination to vary with ability, we introduce the notion that high-ability students expect to be able to overcome it, leading to a second assumption that we can test using the survey.

Testable Assumption 2. *Anticipated discrimination decreases with ability/investment.*

Specifically, following Lang and Manove (2011), $\sigma_\mu^2(i)$ decreases with ability such that, for high enough ability (investment), employers perfectly observe productivity from the direct signal and do not rely on the investment signal.[15] That is, $\sigma_\mu^2(i) = 0$ and therefore $\gamma(i) = 1$ for $i \geq \bar{i}$. Define a^c as the cutoff ability level beyond which $I^*(a) > \bar{i}$.

Major and investment decisions for group M are unchanged from the baseline model. For group F with $a = \underline{a}$ or $a \geq a^c$, the optimal investment decision is characterized by $f_i(a, i) = c_i(a, i)$, so discrimination does not distort investment decisions. For group F with $a \in (\underline{a}, a^c)$, the optimal investment decision is characterized by:

$$f_i(a, i) + (1 - \gamma(i)_{g,O}) f_a(a, i) A'(i) = c_i(a, i).$$

Since $\gamma_{F,0}(i) \leq \gamma_{M,0}(i) = \gamma_{F,1}(i)$, the group invests more in major 0 than major 1 (and invests more in major 0 than group M).

For $a = \underline{a}$ or $a \geq a^c$, students select a major according to Equation (2). For $a \in (\underline{a}, a^c)$, students select major 0 if and only if:

[14] Similar implications could arise if signals are equally noisy but employers underestimate group F's productivity in major 0 conditional on the direct signal they observe, for example due to biases associated with gender stereotypes in STEM/BE fields.

[15] The assumption that discrimination completely disappears beyond a certain ability level is not necessary, but simplifies exposition.

$$E_{\mu,\varepsilon}[P_{F,0}|(I^*_{F,0}, s)] - c(a, I^*_{F,0}) + t_0 > E_{\mu,\varepsilon}[P|(I^*, s)] - c(a, I^*) + t_1.$$

Additional investment yields higher (inferred) productivity, but also higher investment costs in major 0 for these students. Given decreasing returns to i for $f(\cdot)$ and increasing returns to i for $c(\cdot)$, the expected return to major 0 is lower. Group F students are thus less likely to select major 0 and those who do have higher levels of investment conditional on ability, especially in the middle and bottom (excluding the very bottom) of the ability distribution.

Lastly, since group F in major 0 invests more at a given ability level, employers infer lower ability for these students compared to group M. That is, $E_{\mu,\varepsilon}[P_{F,0}|(i, s)] \leq E_{\mu,\varepsilon}[P_{M,0}|(i, s)]$. While our model emphasizes education decisions, this has implications for labor market inequality. Women may exhibit lower ability conditional on grades in STEM/BE fields due to additional signaling, complicating analyses of labor market returns to grades across genders.

2.3 Summary

To summarize, the model, when applied to discrimination faced by women in STEM/BE, generates the following predictions, consistent with Results 1 and 2 from the transcript analysis:

Prediction 1. Women are underrepresented in STEM/BE, particularly in the lower portions of the ability distribution (excluding the very bottom).

Prediction 2. Women in STEM/BE achieve higher grades than men of the same ability, with larger differences in the lower portions of the ability distribution (excluding the very bottom).

One distinction between the model and the results documented in the transcript analysis is that the model also predicts sharp trend breaks and steeper ability gradients when the bottom decile of the ability distribution is excluded. While we did not emphasize this when presenting the transcript results, this additional prediction is directly consistent with

patterns in Figure 1. While the model is static, it also intuitively suggests that newly-enrolled students uncertain about their major may experience shifts in performance after choosing a major. Specifically, declaring a STEM/BE major could lead women to outperform men if it confirms their intent to major in STEM/BE and therefore face discrimination, consistent with panel (c) of Figure 1.

The model introduces anticipated labor market discrimination while abstracting from other factors that could contribute to the empirical patterns we document and the transcript analysis does not allow us to explicitly distinguish between anticipated discrimination and these other factors, motivating the student survey to which we turn next.

3 Student survey

In this section, we present our student survey. We begin by giving an overview of the survey and its implementation in the next subsection. We then present results from the survey's vignette experiment, which aims to test assumptions of the model relating to anticipated discrimination, in the second subsection. Results from the counterfactual choice experiment, which provide further evidence of the existence of anticipated discrimination as well as evidence on the type of discrimination that is anticipated, are presented in the third subsection. Lastly, the fourth subsection uses these counterfactual expectations to test whether subjective beliefs of anticipated discrimination predict student behavior, combining the survey with transcript data.

3.1 Survey overview

In early winter 2024, we conducted an online survey via Qualtrics with first- and second-year students. A random sample of students was invited, and those who completed the survey received a $20 Amazon gift card, a potential $1 bonus based on specific answers, and entry into a drawing for one of 25 $75 Amazon gift cards. A total of 2,133 students completed the survey, corresponding to a response rate of approximately 16%. Table 1 compares the survey sample to the transcript data population, showing slight over-representation of female, lower-income, and high-achieving students, consistent with other student surveys. The survey questionnaire is available in Appendix C.1.

Women in the survey were less likely than men to intend majoring in STEM/BE. As shown in Figure 2, while a majority of both male and female respondents intend to major in STEM/BE, the proportion is significantly higher for men, resulting in a 35-percentage-point gap.[16] Respondents are largely aware of this gender gap. In 2022, the ratios of graduating women to men were 41% in STEM/BE and 68% in non-STEM/BE, while respondents believed these ratios to be 43% and 61%.[17] The gap in STEM/BE intentions also appears to grow over time. Women reported being more likely to major in STEM/BE at enrollment than at the time of the survey, whereas men reported the opposite (Figure B1).

The survey is presented in three subsections. First, we present results from a vignette experiment to test the framework's key assumptions regarding anticipated discrimination. Second, we present results from counterfactual choice questions eliciting respondents' *own* expectations about graduating and pursuing careers in different majors. Combining these beliefs with additional survey evidence and transcript records allows us to test whether anticipated discrimination predicts student behavior, namely intended major and course-taking, in the third subsection.

Overall, the survey aims to address three key questions: (1) Do students anticipate gender discrimination in the labor market based on their major?, (2) What type(s) of discrimination do they anticipate?, and (3) How does anticipated discrimination predict behavior?

3.2 Vignette experiment

First, we present results from a vignette experiment asking respondents questions about fictitious profiles of male and female students in a neutral setting in which we can hold constant key student characteristics. The vignette allows us to test the two model assumptions, namely that (1) female students are anticipated to face more discrimination than male students, especially in STEM/BE, and (2) anticipated discrimination decreases with ability.

The vignettes presented respondents with student profiles varying by gender (male or

[16]The fraction of respondents reporting being likely to major in STEM/BE exceeded the university's 2022 STEM/BE enrollment share. This discrepancy is likely due to three factors: (1) a steady increase in STEM/BE enrollment over the past decade, (2) women switching out of STEM/BE at higher rates during university (Figure B1), and (3) a slight over-representation of STEM/BE students in the survey.

[17]For half of respondents, these questions were incentivized ($0.5 per answer within 1 percentage point of the true ratio), but there was little difference in belief accuracy across the two groups (p-value = 0.81 for the null that incentivized and non-incentized respondents have the same accuracy).

female name) and ability level (bottom 20%, median, or top 20%). All other student attributes — seniority (first-year), interest in each major category, self-perceived preparedness for studying each major, and intended full-time employment — were held constant. Each respondent was shown three randomly-selected profiles out of a total of six, featuring two of the three ability levels and at least one student from each gender. To emphasize comparisons between top-performing students and those lower in the ability distribution, all respondents saw one or two profiles from the top 20% ability, and the remainder from either the bottom 20% or median ability. Therefore, each respondent was shown two profiles, one male and one female, that were identical apart from their gender, including in terms of ability, and a third profile of another ability level that could be either male or female. Appendix Figure B15 an example vignette where the respondent is presented with profiles of a female and male student with high ability (top 20%), and a profile of a female student with low ability (bottom 20%). The design thus allows for within-subject analyses, using answers regarding the two profiles that were identical apart from their gender, as well as between-subject analyses using answers regarding the third profile. As shown below, our results are similar when using either source of variation, suggesting that experimenter demand effects are not driving our results.

Vignettes were presented to respondents in a neutral way, before introducing notions of gender inequality or discrimination in the survey. We first asked respondents which major category would be the best choice for each hypothetical student they were shown and which major category would be relatively harder for that student to have a successful career in. We then asked respondents for a short open-ended explanation for their recommendation regarding the best major choice for a given student. While these questions do not explicitly test for anticipated discrimination, they allow us to test whether differences across profile gender arise and whether respondent justifications explicitly refer to notions of discrimination faced by women in STEM/BE, even before we prime students about discrimination or gender inequality.

We then introduce the notion of discrimination in the survey in order to test Assumptions 1 and 2 of the model by providing explicit evidence on expected discrimination across gender, major, and ability. Discrimination was introduced as follows: "In the media and public discourse, it is sometimes discussed that some students may face additional barriers or disadvantages in certain career paths, for example because of how they are perceived or

treated given stereotypes associated with their gender [...] Name 1, Name 2, and Name 3 are concerned about potential discrimination they may face depending on the major they select." See Appendix Figure B16 for the survey screenshot.

This allows us to conclude the vignette component by directly eliciting, for each student profile presented to the respondent, beliefs about whether the profile is likely to face labor market discrimination, in which major category, and to what extent they can overcome discrimination.

3.2.1 Baseline gender differences

First, we compare beliefs regarding whether STEM/BE or non-STEM/BE would be a better choice for a student profile, separating profiles in whether they have a male or female name. Recall that vignette comparisons hold constant several student characteristics apart from gender, including interest and preparation to study either major category. Moreover, in these comparisons, we also focus on within-respondent variation, which compare a respondent's answers about two profiles of the same ability level, but different gender.

As shown in panel (a) of Figure 3, there exists a sizable difference in respondent beliefs based on a profile's gender. Respondents were more likely to report that STEM/BE would be a better choice for male than female profiles, with a statistically significant difference of approximately 6 percentage points: around 19% of respondents reported that STEM/BE would be a better choice for a male than a female profile, 13% reported the opposite, and the remainder reported that both major categories would be an equally good choice for each gender. In comparison, the raw gender gap in propensity to major in STEM/BE versus non-STEM/BE is approximately 24% at the university. This suggests that a 6 percentage point difference represents approximately 25% of the gap, which is expected to be unexplained by factors like ability, interest, and intentions to work full-time, and may instead be explained by residual factors, including discrimination. Directionally, these differences are present when restricting to either female or male respondents, although they are larger when restricting to the former (Figure B4). They are also similar when instead using between-respondent comparisons (Figure B3).

Holding the same characteristics constant, we then ask respondents in which major category they expect that it would be harder for each student profile to have a successful career in, again comparing answers by whether the profile name was male or female. Panel (b) of

Figure 3 documents a similar statistically significant gender difference of 5 percentage points, with respondents expecting that it would be relatively harder for female than male profiles to have a successful career in STEM/BE. Again, differences are present for both female and male respondents but larger for the former, and are similar using between-respondent comparisons (Figures B4 and B3).

Whenever a respondent made different recommendations as to the best major choice for a male and female profile of the same ability, they were asked to write a brief explanation, without being provided with further information. Notably, over 60% explicitly mentioned some notion of discrimination or differential treatment against women, often explicitly relating to STEM/BE. See Table B1 for example responses. Although they provide only anecdotal evidence, these responses capture some key elements documented more systematically through the rest of the survey. Combined with Figure 3, they make clear that concerns of gender discrimination across majors were present among at least some of our student respondents *before* mentioning discrimination in the survey. This alleviates concerns that our primary findings result from priming or experimenter-demand effects. Moreover, if they did result from such effects, then arguably they should not predict respondent behavior as we will document in Section 3.4.

3.2.2 Anticipated discrimination by profile gender, major, and ability

After introducing concerns of discrimination in the vignettes as detailed in Section 3.2 above, respondents were first asked about the importance that they attached to concerns of such discrimination when making their earlier recommendations regarding which major would be the best choice for a given student profile. Consistent with the open-ended answers discussed above, concerns were substantially more important for recommendations made for female profiles about whether to major in STEM/BE, especially recommendations made by female respondents (Figure B6).

We proceed by explicitly testing for beliefs about expected discrimination across three survey questions. We first test Assumption 1 of the model, "Group F faces (more) labor market discrimination in one major than another and more discrimination than group M in that major" in the context of discrimination faced by female profiles in STEM/BE. Then we provide evidence relating to Assumption 2: "Discrimination decreases with ability/investment". When summarizing these results, we use respondents' answers regarding

all three profiles they were presented with, given that profiles of different gender and ability are equally-represented among respondents by random assignment of vignettes. Nevertheless, results are once again similar when relying instead on "between" variation only using answers regarding profiles which have no counterpart of the same ability but other gender, as detailed below.

The first question asked, for each student profile presented to the respondent: "Do you think there is at least one category of majors in which [Name 1, Name 2, or Name 3] are likely to face additional barriers or disadvantages because of their gender?". This question tests for whether overall labor market discrimination is expected to be stronger for women than men, for now pooling STEM/BE and other majors together. Panel (a) of Figure 4 shows that female profiles were far more likely to be expected to face labor market discrimination (86% vs. 31% for male profiles). These differences are once again larger when restricting to female respondents, though they are present for both female and male respondents (Figure B8). They vary little with profile ability, suggesting that, at the extensive margin, ability is not expected to prevent facing discrimination *entirely* (Figure B7). These results support a first component of Assumption 1: labor market discrimination is expected to be stronger against women.

Among respondents who reported that a profile is likely to face labor market discrimination, we then asked in which major category the profile would be more likely to face discrimination. As shown in panel (b) of Figure 4, the vast majority of these respondents indicated that it would be in STEM/BE for female profiles (89%). The opposite is true for male profiles (71% in non-STEM/BE), although male profiles are expected to be much less likely to face discrimination in the first place, as shown in panel (a). These patterns vary little by respondent gender or profile ability (Figures B7 and B8). These results support the second component of Assumption 1: labor market discrimination against women is expected to be stronger in some majors, namely in STEM/BE.

We then asked respondents whether they expect that a student profile could overcome discrimination using the following question : "Now consider STEM/BE and non-STEM/BE majors together. How likely do you think it is that Name could overcome these additional barriers or disadvantages by working hard and excelling?". Panel (c) of Figure 4 shows that, at the intensive margin, discrimination is expected to be partly overcome through hard work and excelling. This is expected to be particularly likely for male profiles, even though they are

expected to be less likely to face discrimination in the first place. There is also some evidence of a modest ability gradient, especially for female profiles. These results support the notion that effort and good performance are relevant to overcoming discrimination and that high ability students are expected to face less discrimination. Combined with evidence from Figure B6 that respondents were less concerned about high-ability profiles facing discrimination in the first place, these results suggest the existence of an expected ability gradient to discrimination as posited in Assumption 2.

Summarizing the vignette results leads to the following conclusions. First, STEM/BE is perceived as a worse choice and more challenging for women to have a successful career in, even at the same ability level, specifically due to anticipated discrimination. Second, students believe that discrimination can be mitigated through hard work and success. Third, there is some evidence, although more muted, that discrimination is perceived to decrease with ability. Nevertheless, discrimination against women in STEM/BE is expected to persist at all ability levels. These patterns broadly support the main features of discrimination in the theoretical framework, which in turn can rationalize patterns in achievement and major choice documented in the transcript records.

3.3 Counterfactual choice experiment

We now turn to results from the counterfactual choice experiment, asking respondents what conditions they themselves would expect to face, were they to graduate in STEM/BE and non-STEM/BE. These questions allow us to gather individual-level beliefs regarding anticipated discrimination as well as other factors expected to differ across major categories.

These individual expectations allow us to (1) further test whether students anticipate discrimination, (2) present evidence on the type(s) of discrimination anticipated by different types of students, and (3) relate these expectations to behavior and compare the importance of anticipated discrimination to other factors.

In this section, we summarize beliefs gathered from the counterfactual choice questions in three subsections. We begin by presenting a brief overview of students' perceptions about studying and working in STEM/BE versus non-STEM/BE in terms of aspects other than discrimination in the first subsection. Next, we present expectations of discrimination by respondent gender, intended major, and (self-assessed) ability, providing additional evidence

of anticipated discrimination consistent with our theoretical framework. In the third subsection, we go beyond documenting whether discrimination is anticipated and ask which type(s) of discrimination is anticipated, namely in terms of economic outcomes like wages and employment as well as facing more negative workplace conditions. In 3.4, we then relate these expectations to respondent behavior.

3.3.1 General expectations about studying and working in STEM/BE and non-STEM/BE

As shown in Table 2, students expect higher salaries in STEM/BE, but women anticipate earning less than men in both categories—14% less in STEM/BE and 7% less in non-STEM/BE. Students also expect better job prospects within six months of graduating in STEM/BE, with minimal gender differences. Expectations about non-monetary benefits are similar across major categories, though women anticipate slightly better benefits in non-STEM/BE. Students believe STEM/BE requires substantially more weekly study hours to succeed, with women perceiving a slightly larger workload. Men expect to rank 34th out of 100 in ability in both major categories, while women expect to rank lower, particularly in STEM/BE. This self-assessed ability gap exceeds the gender gap in SAT scores, aligning with evidence on gender differences in confidence (Möbius et al., 2022). Finally, women report greater interest in non-STEM/BE subjects, whereas men express the opposite.

3.3.2 Anticipated discrimination by respondent gender, major, and ability

We begin by providing evidence of whether a respondent anticipates facing discrimination overall, either during university or in the labor market, from the following question: "Please answer to what extent you agree with the following statements: While pursuing your degree/In the workplace, you will face additional barriers or disadvantages in university because of your gender". The results, as shown in Figure 5, provide evidence of a stark gender differential consistent with the vignette experiment. Women are significantly more likely than men to anticipate facing discrimination, both in university and in the workplace, particularly in STEM/BE. Women expect greater discrimination in the workplace than in university, although they do expect discrimination while studying STEM/BE. In contrast, men largely disagree that they would face discrimination, regardless of major.

Interestingly, when asked how these expectations have changed since enrolling at the university, women report increased anticipated labor market discrimination, especially in in STEM/BE, suggesting that these expectations grow over their time as students (Figure B9).

Looking at heterogeneity, anticipated discrimination statistically significantly decreases with ability, specifically for women in STEM/BE, with little observed gradient for men or in non-STEM/BE (Figure B13).

Similarly, when asked whether they expect to be able to overcome the discrimination they face with the following question: "Please answer to what extent you agree with the following statements: If you face additional barriers or disadvantages in school or the workplace, you will be able to overcome them if you work hard enough and excel", we document a clear, statistically significant ability gradient for women in STEM/BE (Figure B14). While agreement with the notion that discrimination can be overcome is more similar across respondent gender and major category on average, women in lower parts of the ability distribution for STEM/BE are particularly less likely to agree with the statement.

Overall, these results largely serve to confirm that beliefs documented in the vignette experiment, consistent with key features of the theoretical framework, carry over to respondents' own expectations. Anticipated discrimination by women is much higher, particularly in STEM/BE, and it decreases with ability, again for women in STEM/BE.

3.3.3 What type of discrimination is anticipated?

So far, we have documented the existence of anticipated discrimination, but not what form(s) students expect it to take. We now turn to this question, focusing in turn on discrimination in terms of classical economic outcomes and in terms of differential workplace treatment. These results allow us to better understand the labor market challenges and disadvantages that students expect to face in practice and therefore help inform potential interventions.

We begin by providing evidence regarding the two most studied outcomes in the literature: wages and employment. Figure 6 shows responses to questions about whether students expect a differential likelihood of receiving a job offer or differential pay for the same work, compared to a similarly-qualified candidate of another gender. Panel (a) shows that 60% of women believe they would be less likely to receive a job offer when competing for a position with a similarly-qualified man if they graduated in STEM/BE fields, while fewer than 10% of women expect the opposite. For non-STEM/BE jobs, a plurality of women

anticipate similar chances of receiving an offer. Most men expect similar chances across both major categories. Respondents who anticipated being more or less likely to get an offer were then asked to quantify the expected difference in percentage terms, enabling us to estimate expected offer differentials in panel (b) (respondents who expected no difference in panel (a) were assigned a value of 0 for this calculation). Women expect that they would be 11% (3%) less likely to receive an offer for STEM/BE (non-STEM/BE) jobs, while men anticipate negligible differences. These estimates suggest that, in spite of various industry claims regarding efforts to increase female representation in STEM (Forbes, 2017; FDM Group, 2023; Google Inc., 2023), women expect to be disadvantaged for these positions.

Panels (c) and (d) provide similar evidence on pay. Over 70% of women expect that they would be paid less than similarly-qualified men for the same STEM/BE work, compared to over 75% of men anticipating equal pay. In non-STEM/BE, 51% of women would expect equal pay and a slightly lower fraction would expect lower pay, while most men again expect parity. Women would expect a 10% (6%) wage gap in STEM/BE (other fields), as shown in panel (d). Directionally, men also expect to be paid more, but expect much smaller pay gaps of 3% and 1%.

Comparing these estimates to those of realized labor market discrimination from the literature is challenging. While these anticipated outcome differentials may appear larger than observed gaps in the labor market, for example from correspondence studies or adjusted wage gap regressions, our design differs importantly from those commonly employed in analyses of labor market discrimination. Most importantly, the estimates we present are based on counterfactual outcomes averaged across all respondents, while estimates from the literature are based on equilibrium market outcomes in which workers select into fields. It stands to reason that students who do sort into STEM/BE should perform better on average than those who don't would, if they did. In fact, weighting estimates from panels (b) and (d) by respondents' self-reported probabilities of majoring in STEM/BE versus non-STEM/BE approximately halves expected gaps by women in STEM/BE, although estimates of anticipated discrimination remain substantial and statistically significant (Figure B10). Caution is also warranted when attempting to interpret these estimates as too small or too large, because correspondence studies typically measure callback rather than hiring differentials, and adjusted wage gaps may not accurately approximate the notion of two workers with the same qualifications doing exactly the same work.

Still, men and women disagree on the extent of labor market discrimination, indicating that at least some have inaccurate beliefs on average.[18] We stress that our focus is not on identifying whose beliefs are correct, but on being the first to document these beliefs in the first place. This is particularly important in our setting. As shown in the next section, anticipated discrimination informs important education decisions, whether it is accurate or not. Moreover, Figure B11 provides evidence that, qualitatively, both male and female respondents do anticipate women facing more labor market discrimination than men, especially in STEM/BE. One substantive difference is that women anticipate more discrimination against women than men do.

Beyond economic outcomes, workers also value other workplace conditions, such as environments free of harassment and hostility (Folke and Rickne, 2022; Collis and Van Effenterre, 2024). These workplace conditions could result from differential treatment that does not necessarily result in economic disparities in terms of wages and employment, or could represent some underlying causes of these economic disparities. In either case, if men and women anticipate that they would face different workplace conditions based on their gender and major choice, then these could also influence education decisions.

Panel (e) of Figure 6 shows the frequency with which students expect their workplace competence to be underestimated due to their gender, to face workplace hostility or worse treatment due to their gender, and to face sexual harassment at work. Men expect such instances to be very rare across both major categories. In stark contrast, women anticipate that they would be underestimated frequently in STEM/BE fields and occasionally in non-STEM/BE fields. They also expect that they would face hostility slightly more than occasionally in STEM/BE and somewhat less than occasionally in non-STEM/BE, and that they would experience sexual harassment occasionally in STEM/BE and slightly less than occasionally in non-STEM/BE. For women, differences between anticipated workplace conditions from graduating across major categories are statistically significant for all three outcomes and substantial for the first two. However, the striking takeaway is the high frequency with which women expect negative workplace conditions in either major category. It suggests that such conditions are expected to be a routine feature of working life for women and that, to a large extent, they are not anticipated to be avoidable by choosing between STEM/BE and

[18] Previous work has shown evidence of inaccurate beliefs about the extent of racial discrimination in the labor market (Haaland and Roth, 2023).

other fields. Avoiding these conditions might instead require sorting into specific firms or workplaces, potentially contributing to differential sorting of men and women across firms, even within an industry (Card, Cardoso and Kline, 2016; Vattuone, 2023).

3.4 Does anticipated discrimination predict education decisions?

In this section, we test whether subjective beliefs of anticipated discrimination gathered in the previous section predict student's educational decisions, namely relating to intended major choice and course taking. We begin by describing summary indices of anticipated discrimination constructed from responses to the counterfactual choice experiment in the first subsection, before testing how these indices predict student behavior in the following subsection.

3.4.1 Anticipated discrimination index

We construct standardized indices of anticipated discrimination, separately by gender and major category, by combining answers regarding economic outcomes, workplace conditions, or both, along with the overall extent to which a respondent anticipates labor market discrimination because of their gender, presented in Figure 5.[19]

Figure B12 and Table B2 report values of the overall index by respondent gender and for each of the two potential major categories, prior to standardization across major category and gender, so that values can be compared across columns. Higher values reflect stronger anticipated discrimination. Consistent with the evidence presented above, women, particularly in STEM/BE fields, anticipate discrimination. Men, especially in STEM/BE, anticipate positive discrimination. In Table B2, rows separate respondents by above/below-median interest or ability, revealing a similar pattern throughout, but with lower anticipated

[19]The "economic outcomes" index combines standardized measures of anticipated gender gaps in job offers and pay for respondents who expect to be less or equally likely to receive a job offer or to be paid less or equally than a worker of the other gender. The "workplace conditions" index includes standardized measures of the anticipated frequency of having one's competence underestimated and of facing worse treatment in the workplace. The "overall" index combines these four measures with a standardized measure of agreement about facing additional workplace barriers or disadvantages in the workplace due to gender (presented in 5). It is then standardized again to have a mean of 0 and a standard deviation of 1. Anticipations relating to sexual harassment are evaluated separately.

discrimination for those with high interest or ability.[20]. Lastly, we separate the index by the gender composition of the specific majors (e.g. biology, psychology, nursing, etc.) that respondents reported as the most likely they would choose if they majored in STEM/BE and non-STEM/BE. Anticipated discrimination is higher in majors with higher shares of men, within both STEM/BE and non-STEM/BE, but remains substantial in other majors, particularly in STEM/BE. Overall, anticipated discrimination does not appear confined to a narrow subset of women with limited interest or ability in STEM/BE, or to a narrow subset of majors.

3.4.2 Anticipated discrimination, intended major, and course taking

Table 3 examines the relationship between respondents' stated likelihood of majoring in STEM/BE and non-STEM/BE, elicited near the beginning of the survey through two separate questions (see Figure 2), and anticipated discrimination. Panel (a) shows that anticipated discrimination in STEM/BE predicts a lower likelihood of women intending to major in those fields, with minimal effect on men. Interaction terms between a respondent being female and the index are statistically significant and substantial, indicating an 11–14% decrease in women's intentions to major in STEM/BE for a one standard deviation increase in the index. Adding controls for respondent ability (either test scores or self-assessments in Table B3), interest in STEM/BE content, study hours, and non-monetary job benefits has little effect on these results.[21] Separating the index into its sub-components indicates that the impact appears mostly driven by expected differences in economic outcomes. One explanation for this pattern is that, as shown in Figure 6, the STEM/BE versus non-STEM/BE difference in anticipated discrimination is larger for economic outcomes than for differential workplace treatment.

In non-STEM/BE, interaction terms between respondent gender and anticipated discrimination are smaller and statistically nonsignificant. This likely reflects that most women

[20]Plotting the index against respondent ability, we again find evidence of an ability gradient in anticipated discrimination for women in STEM/BE. The gradient is stronger when using the index than when only using a respondent's level of agreement with the notion that they will face labor market discrimination (Figure B13)

[21]Controlling for the importance of having same-gender peers in the workplace or expected monetary benefits also has minimal impact, as shown in Table B3. These controls are excluded from the main analysis as they may themselves be influenced by anticipated discrimination.

who anticipate discrimination in non-STEM/BE also anticipate similar or greater discrimination in STEM/BE. Therefore, it makes little sense for them to respond to anticipated discrimination in non-STEM/BE by switching into STEM/BE.

We evaluate the implications of these estimates for the gender gap in STEM/BE following two approaches. First, we directly asked respondents whether they would change their major intentions if they did not anticipate discrimination in either major category. Over 10% of respondents reported that they would. The majority of those respondents were women who reported that they would be more likely to major in STEM/BE in the absence of anticipated discrimination, even given substantial switching costs from non-STEM/BE to STEM/BE. Computing counterfactual intended major choices suggests that it would decrease the gender gap in STEM/BE by 12%. This is likely a lower bound, since students have taken 1-3 semesters of courses at the university at the time of the survey.

Second, we estimate a regression of the probability of a student intending to major in STEM/BE as a function of gender and progressively control for gender differences in student various characteristics, including anticipated discrimination, to investigate how closing these gender differences would close the gender gap in intentions to major in STEM/BE. Depending on the order in which we include the controls, accounting for the stark gender difference in anticipated discrimination closes between 16 and 39% of the gender gap in STEM/BE - a substantially larger share than accounting for gender differences in expected salary, interest, or ability, which are all substantially smaller than differences in anticipated discrimination. See Table B3 for an example.

Lastly, we investigate the impact of anticipated discrimination on first-term course taking, which likely contribute to eventual differences in major choice, by linking survey responses to transcript records. Table B5 shows that women who anticipate one standard deviation higher discrimination in STEM/BE take 10% fewer STEM/BE courses, with little evidence of responses by men. Expectations of discrimination gathered in the survey thus also relate to pre-determined education decisions of students from outside the survey.

4 Conclusion

This paper shows that anticipated gender discrimination in the labor market distorts college students' major choice, namely by dissuading women from studying in STEM, business, and

economics, in turn contributing to their well known, long-standing under-representation in those fields. Using administrative transcript records, we identify novel empirical patterns of major choice and achievement. In particular, women are less likely to major in STEM/BE, but the gender gap is substantially smaller near the top of the ability distribution. Moreover, women who do decide to major in STEM/BE obtain higher grades than men of the same ability. A theoretical framework rationalizes these patterns as resulting from female students' anticipation of labor market discrimination in STEM/BE.

Survey data confirms the notion that female students anticipate discrimination, particularly in STEM/BE and particularly lower in the ability distribution, while men anticipate little discrimination regardless of their intended major. Women anticipate discrimination in terms of lower pay, fewer job opportunities, and negative workplace conditions. These expectations appear to dissuade women from majoring in STEM/BE, with little effect on men's choices.

Our findings point to several avenues for future research. For example, how women perceive the relationship between achievement, success, and discrimination remains relatively unexplored. Although high-ability women expect less discrimination in our survey, even they anticipate significant barriers. Understanding what determines whether some women persevere in the face of discrimination while others withdraw could provide insights into research on confidence, bargaining, and competitiveness (Niederle and Vesterlund, 2007; Biasi and Sarsons, 2022; Roussille, 2024).

One key question is how beliefs about discrimination are formed and evolve. Addressing gender inequality could require interventions targeting both perceptions and actual discrimination. Interventions might also be needed at different stages: before college, during university, and in the workplace.[22] More than half of women in our survey report having had negative experiences in STEM/BE courses and activities as well as having been exposed to discouraging information about STEM/BE for women (Figure B2). Anticipated discrimination also increases over time during university for women in STEM/BE (Figure B9). These patterns suggest that anticipated STEM/BE discrimination in the labor market may be shaped by earlier exposure of women to negative treatment in those fields. Understanding these processes and how they align with realized labor market experiences is critical

[22] Cvencek, Meltzoff and Greenwald (2011) finds that children as young as second grade associate mathematics more strongly with boys than girls.

for designing effective policies.

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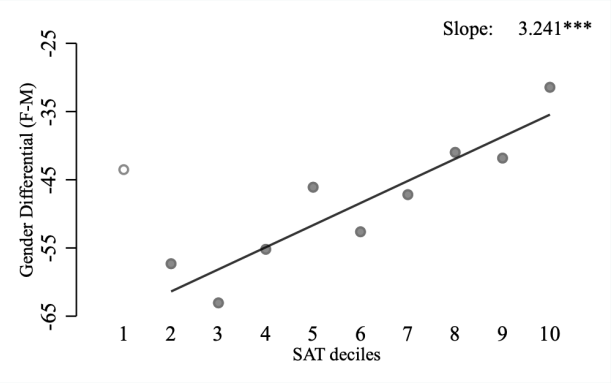
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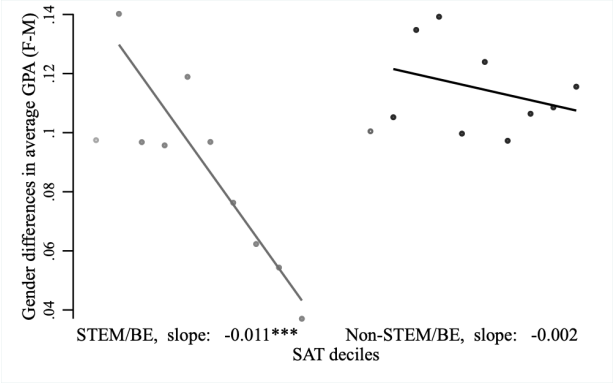
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Figure 1: Gender differences in major choice and grades from transcript records

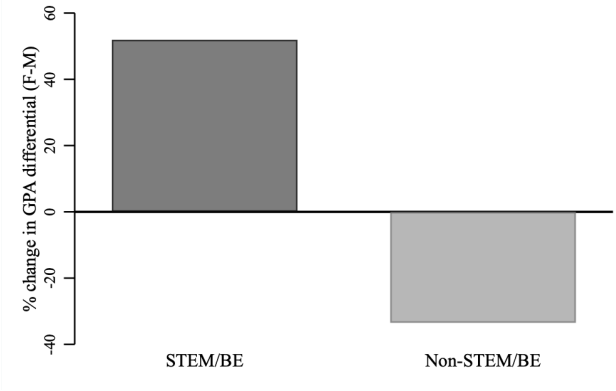
(a) Relative propensity to major in STEM/BE



(b) Relative grades across major and ability

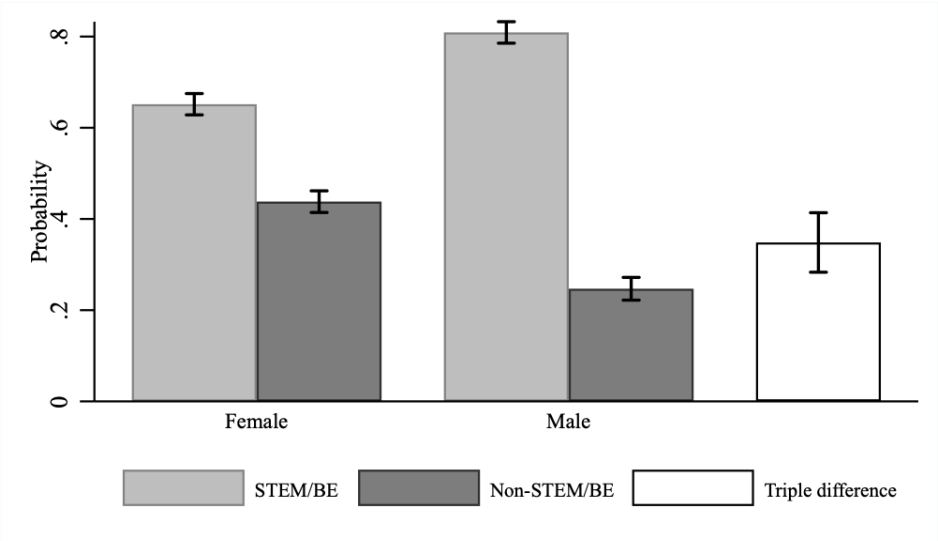


(c) Change in gender grade differential after declaring a major



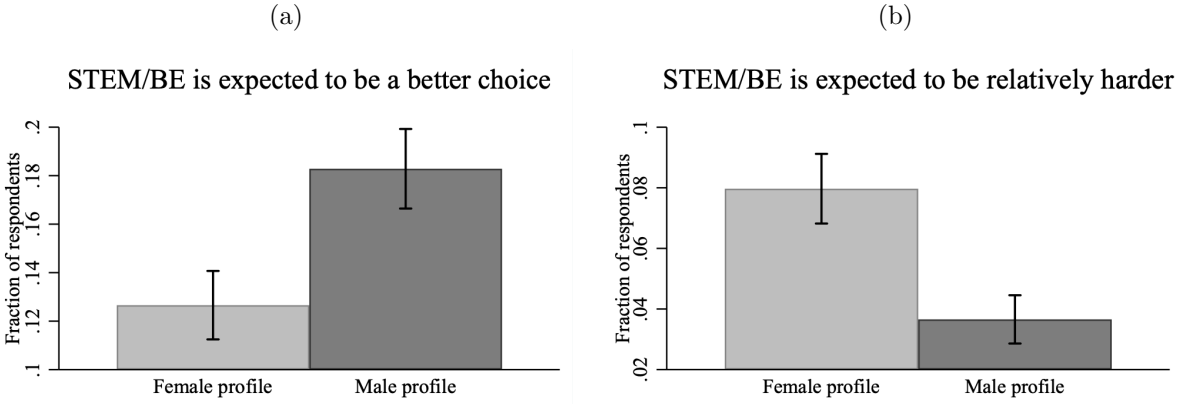
Notes: Panel (a) plots the gender difference in the probability of majoring in STEM/BE versus other majors across SAT deciles. The gender difference is calculated as the fraction of women who graduate in STEM/BE minus the fraction of women who graduate in non-STEM/BE, minus the corresponding difference for men. Panel (b) plots the gender differences in graduating cumulative GPA, across SAT deciles and separately for STEM/BE and non-STEM/BE. Panel (c) plots the change in the gender difference in GPAs (Female GPA - Male GPA) from the term before students declared a major to the term after they declared a major, separately for students who declared a major in STEM/BE and those who declared a major in non-STEM/BE. We use the final major declared by a student for this analysis. This figure is based on the records of 39,650 undergraduate students first enrolled between fall 2013 and fall 2020.

Figure 2: Intended major by gender in the survey



Notes: This figure reports the intended probability of survey respondents to major in STEM/BE and non-STEM/BE, by gender. The rightmost bar labeled "Triple difference" corresponds to the gender gap (Male - Female) in the probability of majoring in STEM/BE minus the gender gap in the probability of majoring in non-STEM/BE. Probabilities for each respondent need not add up to 1 since students can have more than one major, but in practice they are very close to 1 for most respondents. The two corresponding survey questions are: "What do you think is the percent chance (or chances out of 100) that you will graduate with a major in [STEM/BE OR non-STEM/BE]?".

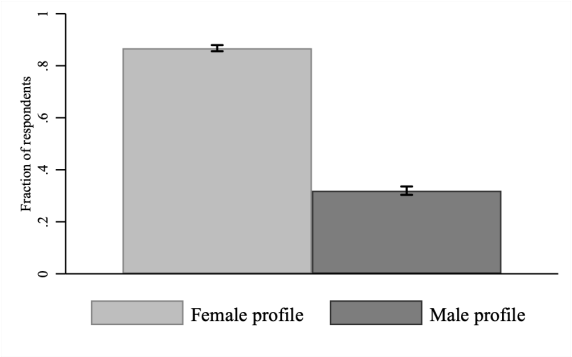
Figure 3: Major fit and career difficulty by profile gender in the vignette experiment



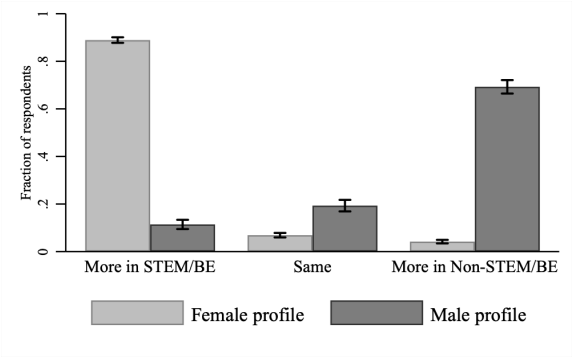
Notes: In the left panel (a), the two bars show the fraction of respondents who assign a higher probability to STEM/BE being the best major choice for a hypothetical female (male) than male (female) profile. In the right panel (b), the two bars show the fraction of respondents who reported that it would be harder for a hypothetical female (male) profile to have a successful career in STEM/BE than non-STEM/BE, compared to a male (female) profile. The figure is computed from within-respondent comparisons for two hypothetical students of different genders, but the same ability level. Corresponding survey questions are: "To what extent do you think that majoring in STEM/BE (as opposed to non-STEM/BE) would be the best choice for each student? [Answer ranges from 0 to 100.]" and "In which major category would it be more difficult for [name] to have a successful career? [Answer ranges from -3 (non-STEM/BE) to 3 (STEM/BE).]".

Figure 4: Anticipated discrimination in the vignette experiment

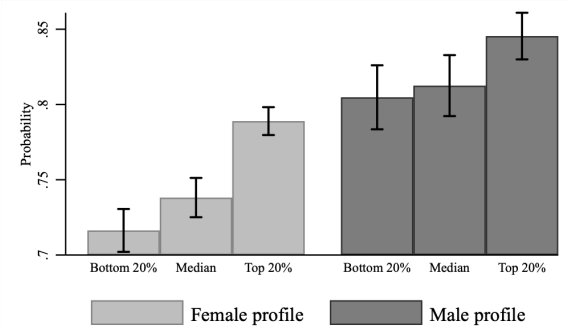
(a) Student is likely to face discrimination (yes = 1)



(b) Major in which student will face more disc.

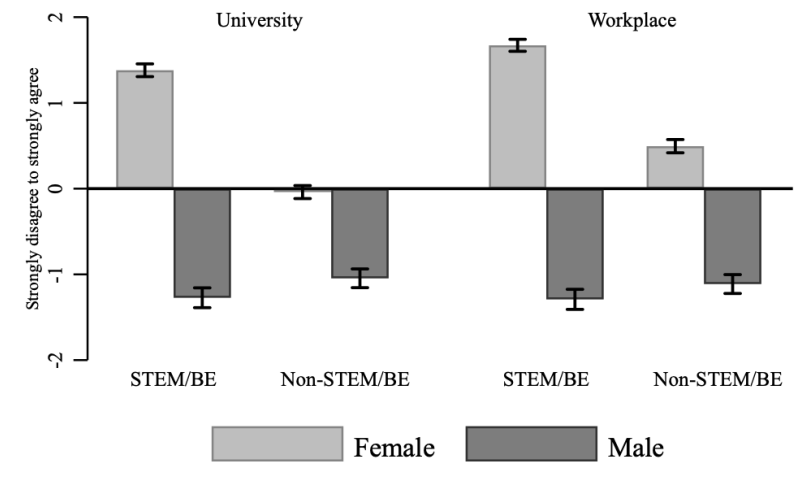


(c) Likelihood that the student can overcome disc.



Notes: Panel (a) displays the fraction of respondents who answered "Yes" (1) rather than "No" (0) to the following question: "Do you think there is at least one category of majors in which [names] are likely to face additional barriers or disadvantages because of their gender?", separately for female and male profiles. Panel (b) displays the fraction of respondents who indicated that discrimination faced by a student profile would be more, equally, or less likely in STEM/BE than non-STEM/BE, separately for female and male profiles. The question was only asked to respondents who answered "Yes" to the question from Panel (a) and was asked as follows: "In which major category would [names] be more likely to face additional barriers or disadvantages?". Panel (c) shows the reported likelihood across respondents that a student profile could overcome discrimination, separately by profile gender and ability, based on the following question: "How likely do you think it is that [names] could overcome these additional barriers or disadvantages by working hard and excelling?" [1-100]. The figure is computed using respondents' answers for each of the three student profiles presented to them.

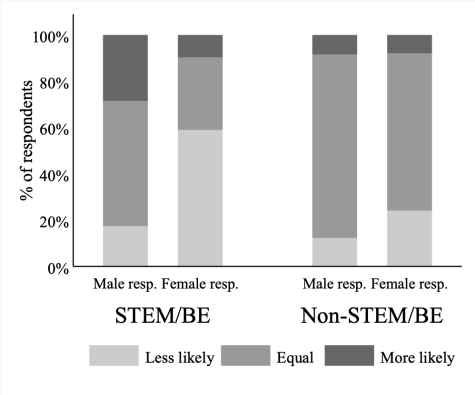
Figure 5: Anticipated discrimination in university and the workplace



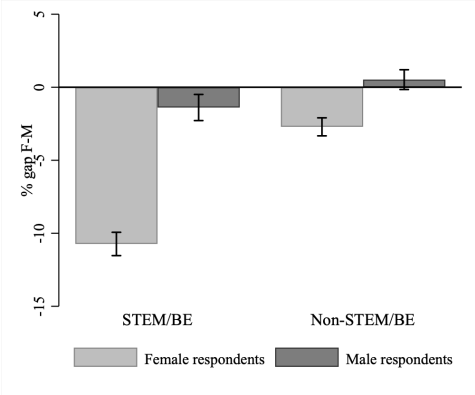
Notes: This figure plots anticipated discrimination in university and the workplace by respondent gender and their hypothetical major choice. The corresponding question was: "While pursuing your degree, you will face additional barriers or disadvantages in university because of your gender" and "In the workplace, you will face barriers or disadvantages because of your gender." The answer scale ranges from strongly disagree (-3) to strongly agree (3).

Figure 6: Anticipated discrimination in job offers, pay, and negative workplace conditions

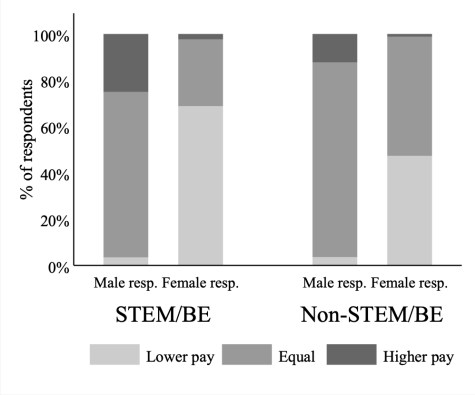
(a) Relative likelihood of getting an offer



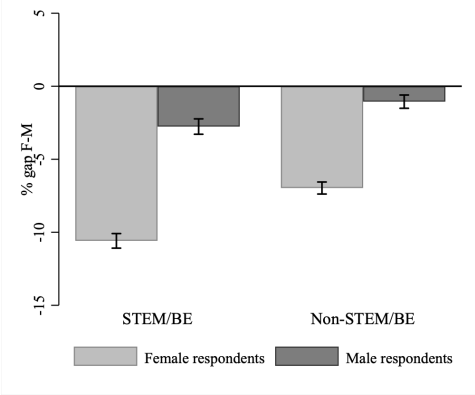
(b) Expected gender gap in job offers



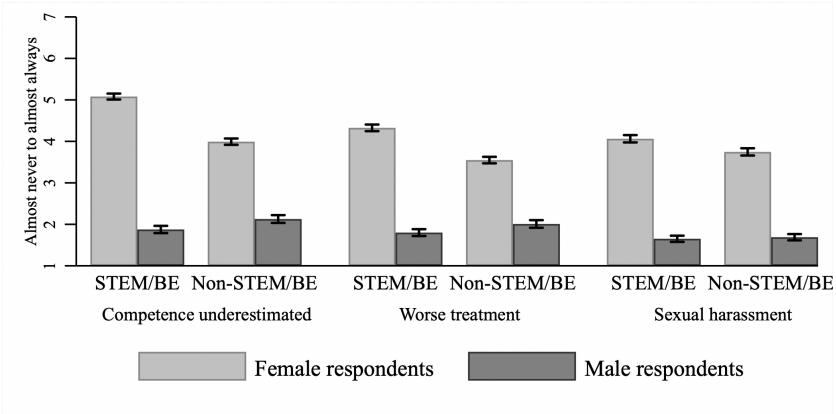
(c) Relative pay



(d) Expected gender pay gap



(e) Frequency of negative workplace conditions



Notes: Panel (a) displays the fraction of respondents who expect to be less/equally/more likely to receive a job offer than a similarly-qualified applicant of another gender, by respondent gender and their hypothetical major choice. Panel (c) displays the fraction of respondents who expect to be paid less/equally/more for the same work than a similarly-qualified applicant of another gender, by respondent gender and their hypothetical major choice. The corresponding survey questions are: "Do you expect to be [more or less likely to receive an offer for a job you apply to/paid more or less for doing the same work] than a similarly-qualified graduate of the opposite gender?". Panels (b) and (d) display the expected gender gaps in job offers and pay. When respondents expected equal outcomes in terms of job offers or pay, we assigned an expected gender gap of 0. When they expected different outcomes, the gap was calculated based on the following survey questions: "You said that you think you are [more/less likely to receive an offer/ expect to be paid more/less] in [STEM/BE or non-STEM/BE] than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect." Panel (e) reports responses to the following questions by respondent gender and their hypothetical major choice: "How frequently do you expect that the following situations will arise at your workplace: [Your competence will be underestimated or questioned because of your gender/You will face hostility or worse treatment because of your gender/You will face sexual harassment]? Please answer on a scale of 1-7, where 1 means almost never and 7 means almost always.".

Table 1: Summary statistics and comparison between transcript and survey samples

	Transcript		Survey population		Survey sample	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
	(1)	(2)	(3)	(4)	(5)	(6)
Age	22.22	(0.68)	18.87	(1.20)	18.75	(1.08)
Female	0.51	(0.50)	0.56	(0.50)	0.62	(0.49)
White	0.72	(0.45)	0.63	(0.48)	0.63	(0.48)
URM	0.09	(0.29)	0.24	(0.43)	0.20	(0.40)
International	0.04	(0.20)	0.06	(0.23)	0.06	(0.23)
GPA	3.49	(0.41)	3.55	(0.51)	3.63	(0.40)
SAT	1,425	(96)	1,402	(134)	1,415	(127)
Household income less than $99,000	0.22	(0.41)	0.26	(0.44)	0.30	(0.46)
Household income more than $100,000	0.54	(0.50)	0.51	(0.50)	0.48	(0.50)
Observations	39,650		13,705		2,133	

Notes: Columns 1 and 2 correspond to our transcript analysis sample, including all students who initially enrolled between fall 2013 and fall 2020 and subsequently earned a degree. Columns 3 and 4 correspond to the survey population of all current freshmen and sophomores, while columns 5 and 6 correspond to the survey sample. "URM" represents U.S. citizens or U.S. permanent residents who have self-identified as belonging to specific race/ethnicity categories, including Hispanic, Native American, Black or African American, Native Hawaiian, or Other Pacific Islander. The "International" indicator denotes whether the student is an international student. GPA refers to the cumulative GPA at graduation for the transcript population and the cumulative GPA at the start of Winter 2024 for columns 3-6.

Table 2: Expectations about studying and having a career in STEM/BE versus non-STEM/BE

	STEM/BE			Non-STEM/BE			Difference (P-value) STEM/BE vs Non-STEM/BE	
	Female	Male	P-value	Female	Male	P-value	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Find a good job within 6 months of graduation (%)	73.43	74.95	0.07	54.96	53.42	0.10	0.00	0.00
	(18.27)	(18.82)		(20.05)	(21.51)			
Full-time work annual salary at age 30 ($1,000s)	108.80	126.86	0.00	70.53	75.98	0.01	0.00	0.00
	(73.92)	(97.54)		(50.60)	(41.90)			
The career provides good non-monetary benefits (%)	63.54	66.79	0.00	67.28	66.02	0.12	0.00	0.41
	(21.15)	(20.51)		(17.81)	(17.95)			
Weekly studying hours in order to do well	26.46	24.83	0.01	17.41	16.41	0.03	0.00	0.00
	(13.81)	(12.87)		(10.26)	(10.52)			
Rank in terms of ability (1=best, 100=worst)	44.08	33.63	0.00	37.40	34.58	0.01	0.00	0.34
	(25.38)	(25.03)		(23.21)	24.54)			
Interested in subject content (%)	67.78	75.34	0.00	73.38	64.26	0.00	0.00	0.00
	(24.98)	(21.53)		(20.76)	(23.63)			

Notes: This table summarizes expectations regarding studying and having a career in STEM/BE and non-STEM/BE, split by respondent gender. The corresponding survey questions are: "If you were to graduate in each of these major categories [STEM/BE or non-STEM/BE], what do you think is the percent chance that you could find a good job within 6 months of graduating?", "If you were to graduate in each of these major categories [STEM/BE or non-STEM/BE], what do you think would be your annual salary if you worked full-time at age 30?", "How likely are the following to happen if you major in each category [STEM/BE or non-STEM/BE]: (1) the career will provide good non-monetary benefits (working conditions, schedule flexibility, etc.) and allow for a good work-life balance; (2) the subject content related to courses and careers will be interesting.", "If you were to major in each of these categories [STEM/BE or non-STEM/BE], what is the average number of hours that you think you would have to spend studying per week in order to do well in the major?", and "If you were to graduate in each of these major categories [STEM/BE or non-STEM/BE], where do you think you would rank in terms of ability among graduates of that major category (1=best, 100=lowest)?"

Table 3: Anticipated discrimination and intended major choice

Panel (A): STEM/BE				
	(1)	(2)	(3)	(4)
Female	-18.575***	-12.199***	-17.701***	-11.852***
	(4.059)	(3.829)	(4.049)	(3.712)
AD index	2.527	4.283		
	(3.196)	(2.981)		
Female × AD index	-9.615***	-8.551**		
	(3.538)	(3.377)		
Economic outcomes index			3.288	3.976
			(2.693)	(2.669)
Female × Economic outcomes index			-9.266***	-8.597***
			(2.986)	(3.015)
Workplace conditions index			0.042	2.273
			(3.992)	(3.786)
Female × Workplace conditions index			0.462	-2.427
			(4.612)	(4.460)
Sexual harassment			-1.606	-2.150
			(4.140)	(3.936)
Female × Sexual harassment			-0.212	3.377
			(4.483)	(4.301)
Controls		Yes		Yes
Observations	2,054	1,262	2,054	1,262
Outcome mean	71.337	77.662	71.337	77.662
Panel (B): Non-STEM/BE				
	(1)	(2)	(3)	(4)
Female	17.372***	6.746**	13.697***	5.306*
	(2.468)	(2.736)	(2.832)	(3.066)
AD index	1.548	2.707		
	(2.116)	(2.293)		
Female × AD index	2.570	2.680		
	(2.461)	(2.731)		
Economic outcomes index			-3.295	-0.443
			(2.149)	(2.588)
Female × Economic outcomes index			1.800	2.459
			(2.431)	(2.952)
Workplace conditions index			3.015	2.964
			(2.232)	(2.374)
Female × Workplace conditions index			2.507	0.150
			(2.816)	(3.076)
Sexual harassment			3.941	2.124
			(2.889)	(3.026)
Female × Sexual harassment			-3.322	-1.500
			(3.272)	(3.497)
Controls		Yes		Yes
Observations	2,054	1,262	2,054	1,262
Outcome mean	36.298	29.396	36.298	29.396

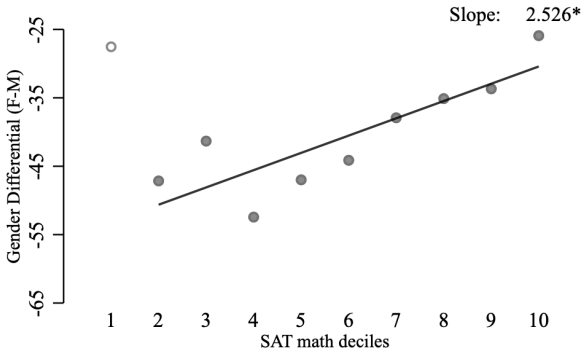
Notes: This table presents estimates from an OLS regression of the intended probability of majoring in STEM/BE in Panel (a) and non-STEM/BE in panel (b). The variable "Female" is a binary indicator with a value of one (zero) when the student self-identifies as female (male) in the survey. The Economic outcomes index includes standardized measures of the expected gender gap in job offers and pay for students who expect to be less or equally likely to receive a job offer or to be paid less or equally. The workplace conditions index includes standardized measures of the frequency of being underestimated or facing worse treatment. The Overall index includes those four standardized measures, along with a standardized measure of how strongly the respondent agrees that they will face additional barriers or disadvantages in the workplace because of their gender. The overall index is further standardized to have a mean of 0 and a standard deviation of 1. When indicated, controls include respondents' stated likelihood of the career providing good non-monetary benefits, weekly studying hours in order to do well, SAT score, and interest in the subject content in STEM/BE for panel (a) and non-STEM/BE for panel (b). The sample size decreases when adding controls because the university adopted a test-optional policy in 2021, leading to some students having missing entry test scores. Results are similar when instead controlling for self-assessed ability, which is available for all respondents (Table B3). See footnote 19 for details on the anticipated discrimination index and notes from Table 2, Figure 5, and Figure 6 for corresponding survey questions. Standard errors are reported in parentheses, and ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

A Additional transcript evidence

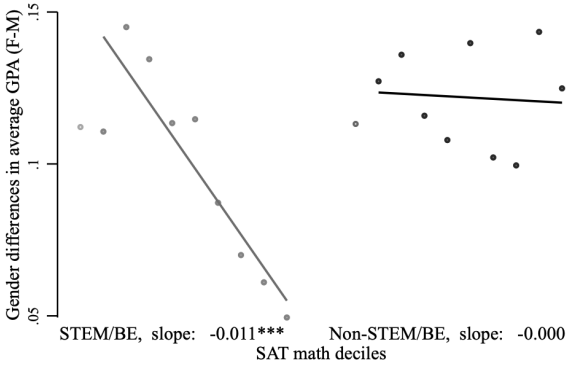
A.1 Figures

Figure A1: Transcript evidence using SAT Math scores

(a) Relative propensity to major in STEM/BE

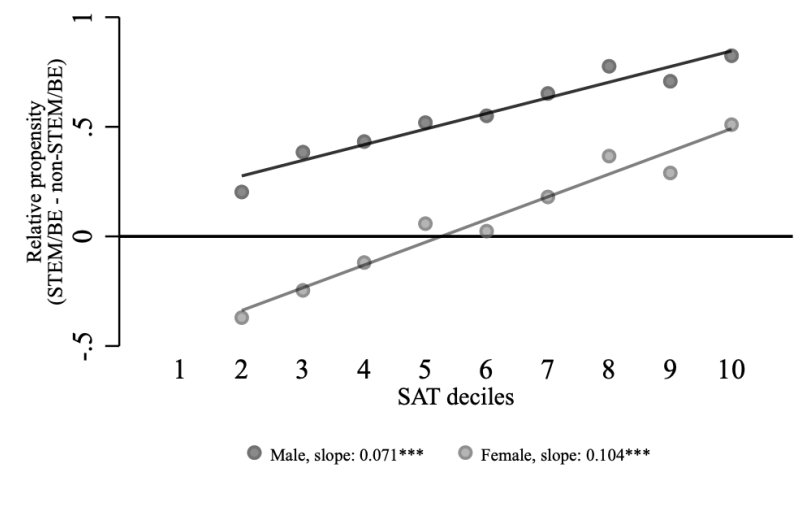


(b) Relative grades across major and ability



Notes: See Figure 1 for details.

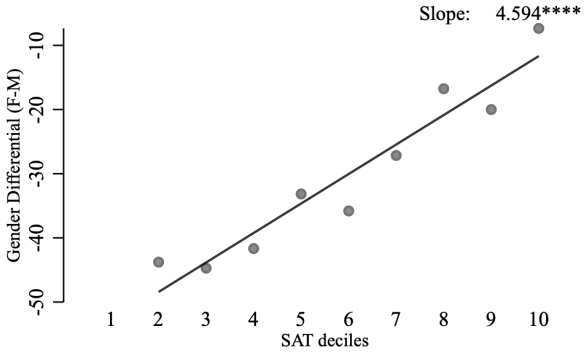
Figure A2: Propensity to major in STEM/BE, separately by gender



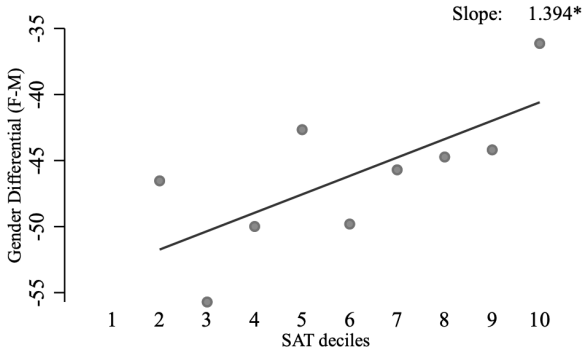
Notes: This figure plots the fraction of students majoring in STEM/BE minus the fraction of students majoring in non-STEM/BE, across SAT deciles and by gender. See Figure 1 for additional details.

Figure A3: Transcript evidence excluding specific majors

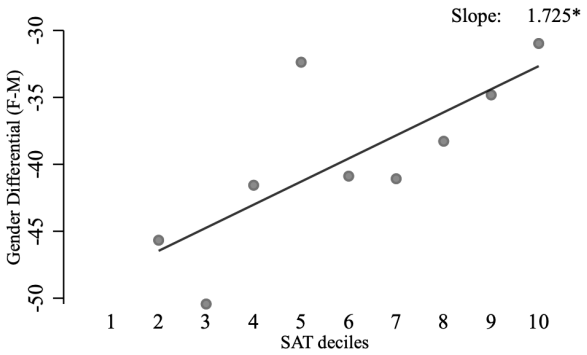
(a) Relative propensity to major in STEM/BE, excluding engineering



(b) Relative propensity to major in STEM/BE, excluding female-dominated STEM/BE majors



(c) Relative propensity to major in STEM, excluding BE



Notes: The figure plots the gender difference in the probability of majoring in STEM/BE versus other majors, across SAT deciles and for three samples. Panel (a) excludes engineering majors, which require applying to a different school within the university. Panel (b) excludes majors within STEM/BE that have a majority of female students, namely biology. Panel (c) restricts to STEM majors, excluding business and economics. See Figure 1 for additional details.

A.2 Tables

Table A1: Change in gender grade differential after declaring a major, additional controls and dependent variable

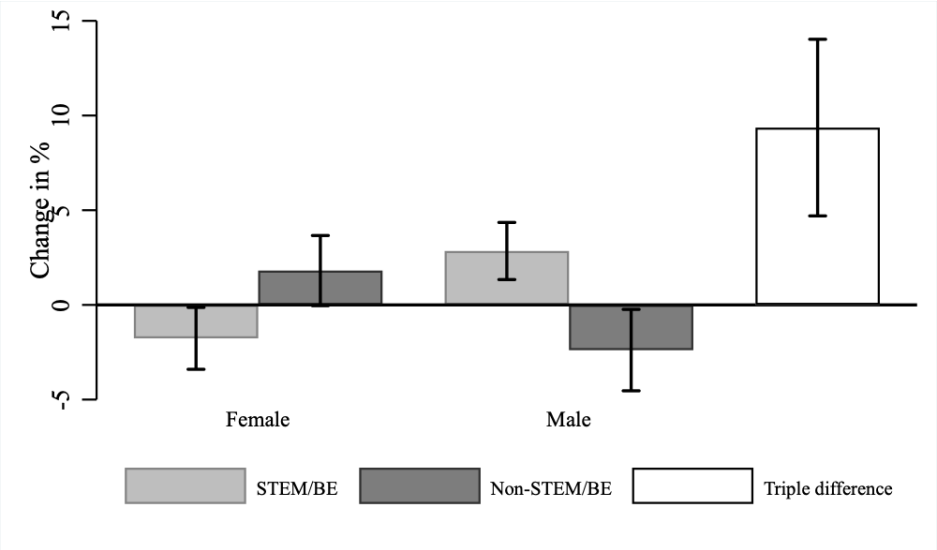
	Dep: GPA		Dep: Major specific GPA	
	STEM/BE	Non-STEM/BE	STEM/BE	Non-STEM/BE
	(1)	(2)	(3)	(4)
Female	0.016**	0.111***	0.019	0.085***
	(0.008)	(0.011)	(0.014)	(0.019)
After declaration	0.086***	0.236***	0.208***	0.355***
	(0.006)	(0.011)	(0.009)	(0.016)
Female × After declaration	0.027***	-0.059***	0.085***	-0.031
	(0.008)	(0.012)	(0.014)	(0.020)
Major FE	Yes	Yes	Yes	Yes
Declaration term FE	Yes	Yes	Yes	Yes
Observations	44,635	27,348	30,064	14,173
Outcome mean	3.389	3.472	2.361	2.867

Notes: This table presents estimates from an OLS regression of students' GPA on their gender and whether they have declared their major for the final time, separately for whether they declared a major in STEM/BE or non-STEM/BE. The variable "Female" is a binary indicator with a value of one (zero) when the student self-identifies as female (male) in the survey. The variable "After declaration" is a binary indicator with a value of one (zero) in the term before (during) which students declare a major. Major FEs are fixed effects for narrower major categories, encompassing fields such as Engineering, Humanities, Natural Science, and Social Science. Declaration term FEs are fixed effects for the term in which a student declared their graduating major. GPA refers to term GPA, while major-specific GPA is calculated based on grades in major-specific core courses. Clustered standard errors at the individual level are reported in parentheses, and ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

B Additional survey evidence

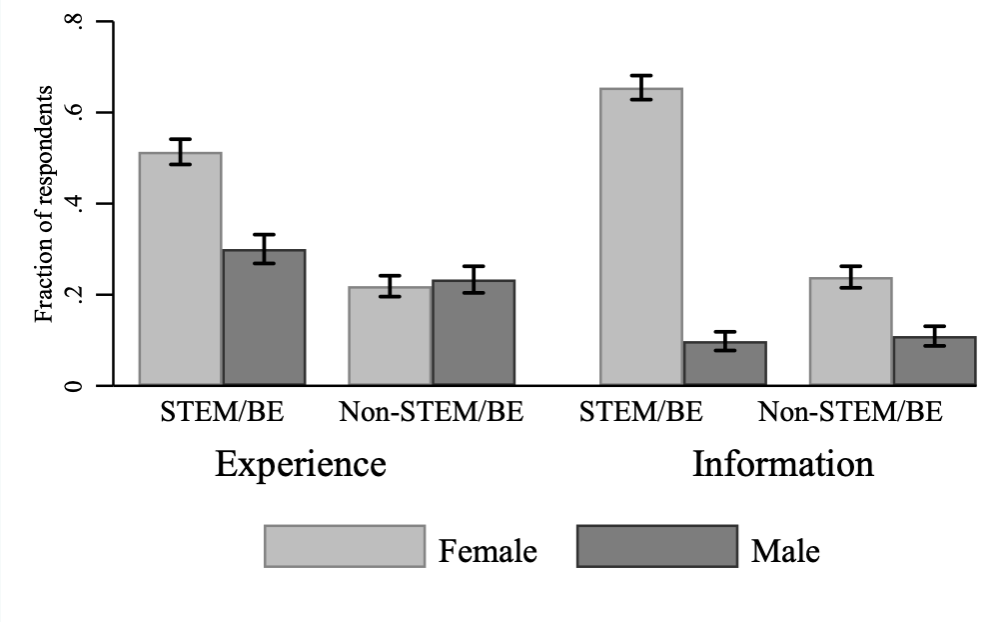
B.1 Figures

Figure B1: Change in intended major between enrollment and the time of the survey



Notes: This figure illustrates changes in the reported probability that survey respondents will major in STEM/BE and non-STEM/BE since their enrollment, separately by gender. The rightmost bar labeled "Triple difference" corresponds to the gender gap (Male - Female) in the change in probability of majoring in STEM/BE minus the gender gap in the change in probability of majoring in non-STEM/BE. The survey asked respondents how they would have answered the following question just before starting university: "What do you think is the percent chance (or chances out of 100) that you will graduate with a major in [STEM/BE OR non-STEM/BE]?" and subtracts from it their answer to the question shown in Figure 2. Probabilities for each respondent need not add up to 1 since students can have more than one major, but in practice they are very close to 1 for most respondents.

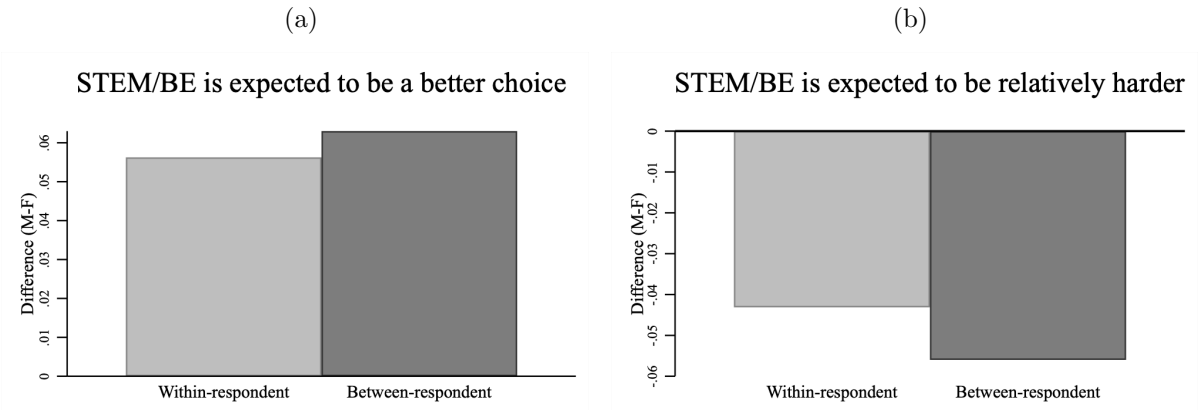
Figure B2: Had a negative experience or was exposed to negative information



Notes: This figure plots the fraction of respondents who reported having had negative experiences or having been exposed to negative information, separately for each major category and by respondent gender. Participants were asked to indicate yes or no to the following statements: "Have you ever had any unpleasant and/or negative experiences in courses or activities which discouraged you from studying that major category? Have you been exposed to information suggesting that studying in the major category or working in related fields would be less suitable or more difficult because of your gender?"

B.1.1 Evidence from the vignette experiment

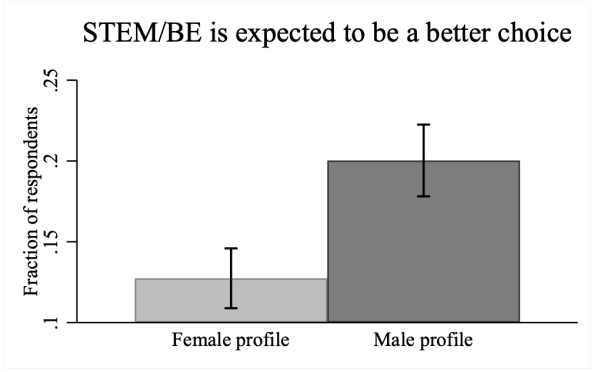
Figure B3: Major fit and career difficulty across profile gender in the vignette experiment, between-respondent variation



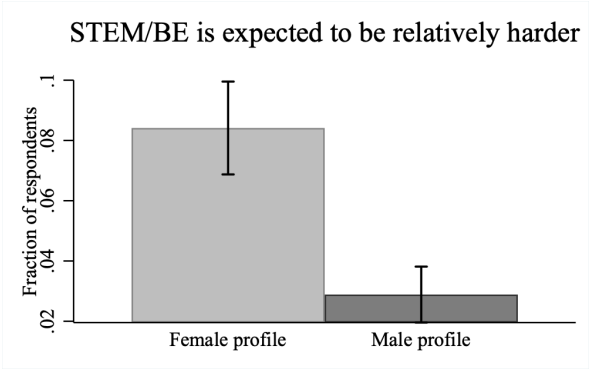
Notes: In panel (a), the two bars show the within and between differences in the fraction of respondents who assign a higher probability to STEM/BE being the best major choice for a hypothetical male than female profile, and vice versa. In panel (b), the two bars show the within and between differences in the fraction of respondents who reported that it would be harder for male profiles to have a successful career in STEM/BE than non-STEM/BE, compared to female profiles, and vice versa. For between differences, we compared answers across profile gender between 100 randomly-matched pairs of respondents who were shown profiles of the same two ability levels and repeated the process 100 times. See Figure 3 for additional details.

Figure B4: Major fit and career difficulty across profile gender in the vignette experiment, by respondent gender

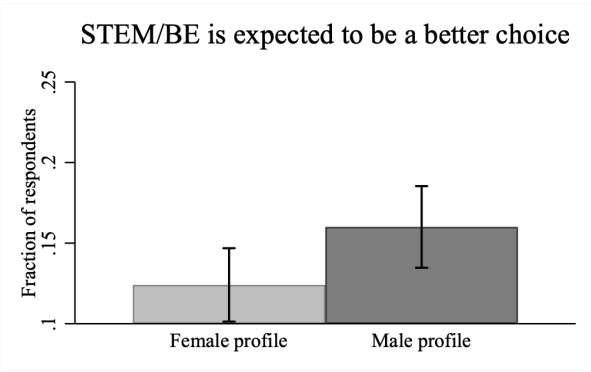
(a) Female respondents



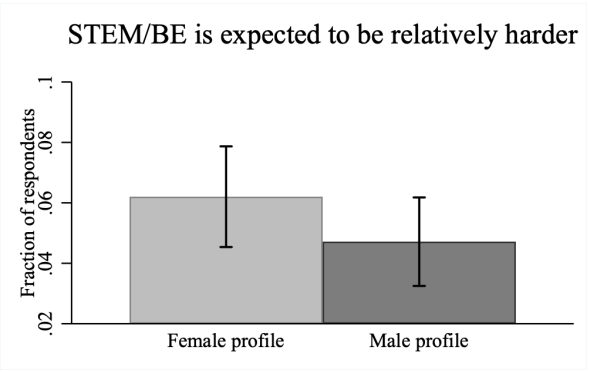
(b) Female respondents



(c) Male respondents



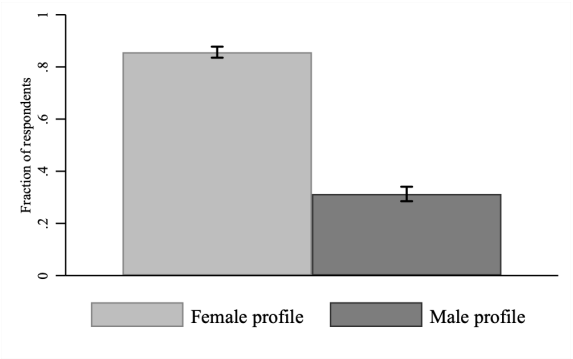
(d) Male respondents



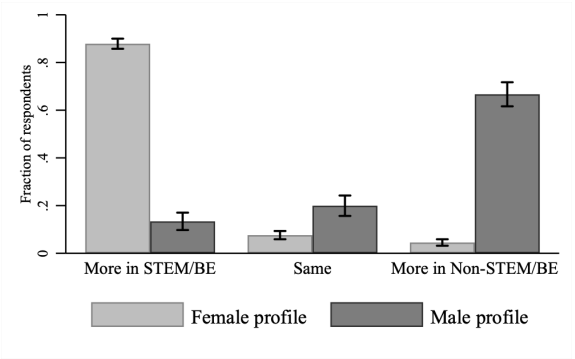
Notes: The figure is computed from within-respondent comparisons for two hypothetical students of different genders, but the same ability level. See Figure 3 for additional details.

Figure B5: Anticipated discrimination in the vignette experiment, between-respondent variation

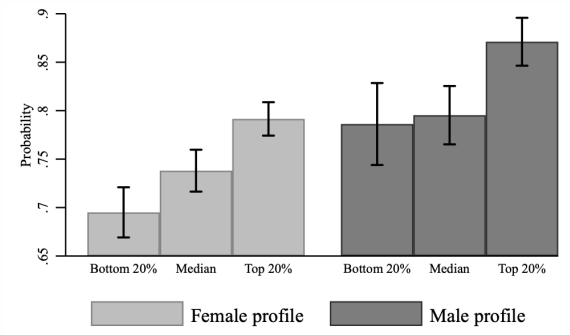
(a) Student is likely to face discrimination (yes = 1)



(b) Major in which student will face more disc.

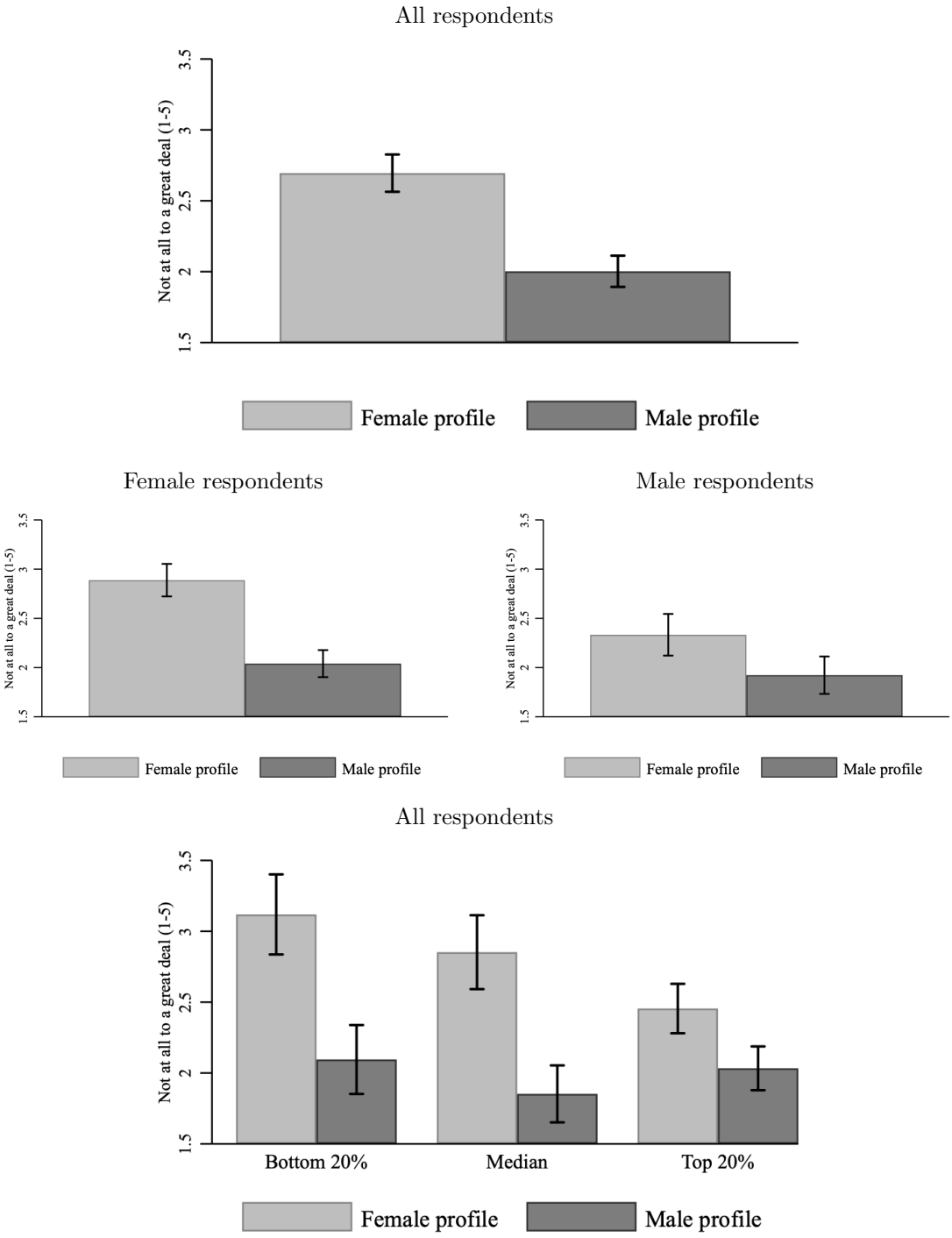


(c) Likelihood that the student can overcome disc.



Notes: The figure is computed from between-respondent profile comparisons. Specifically, for each respondent, we use only answers referring to one of the three student profiles they were shown: the profile that did not have a counterpart profile of the other gender but same ability level. See Figure 4 for additional details.

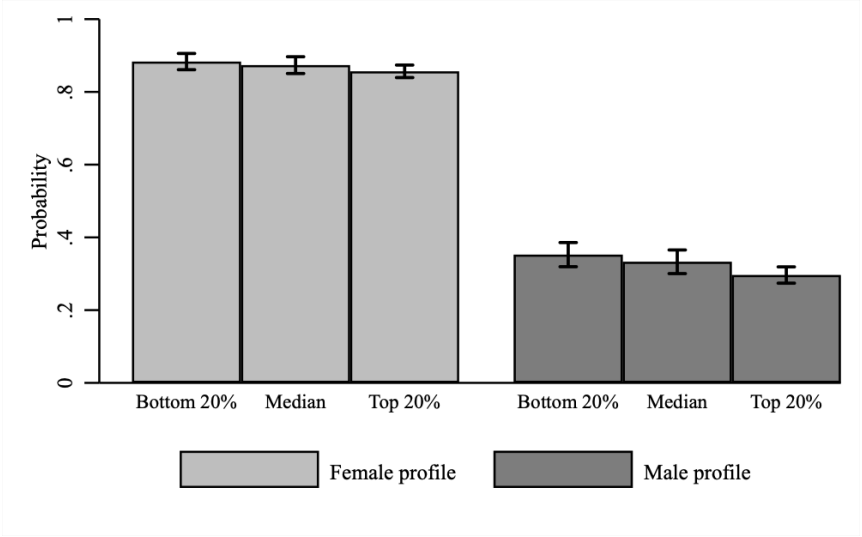
Figure B6: How important were concerns of discrimination when recommending a major for a given student profile, by profile gender and ability



Notes: This figure shows the importance of respondents' concerns about discrimination when making the major recommendations for hypothetical student profiles shown in Figure 3, based on the following survey question: "How much did concerns of discrimination or differential treatment factor into your previous answer about whether majoring in STEM/BE or non-STEM/BE would be the best choice for the student?" [1-5]. Answers are restricted to the subset of respondents who reported that STEM/BE would be a better choice for male than female profiles, based on within-respondent comparisons for two hypothetical students of different genders, but the same ability level. See Figure 3 for additional details.

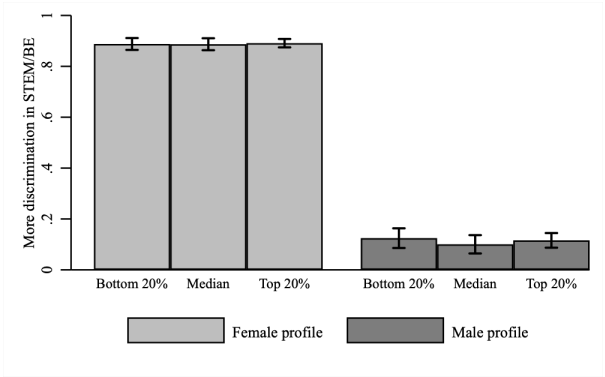
Figure B7: Anticipated discrimination in the vignette experiment, by profile ability

(a) Student is likely to face discrimination (yes = 1)

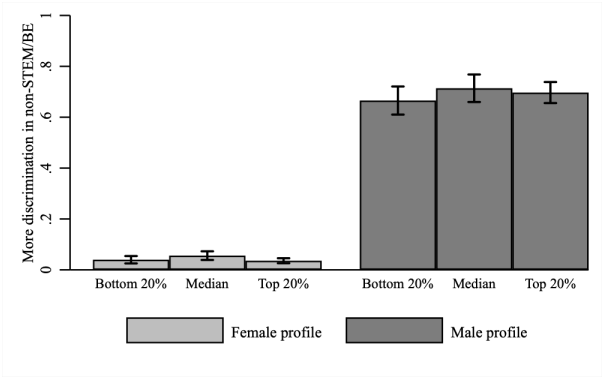


(b) Major in which student will face more disc.

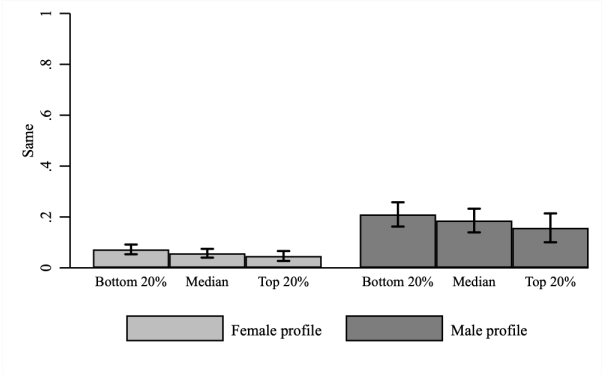
(b.1) STEM/BE



(b.2) Non-STEM/BE



(b.3) Same

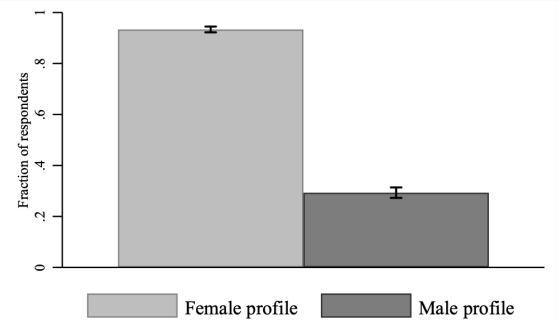


Notes: The figure is computed using respondents' answers for each of the three student profiles presented to them. See Figure 4 for additional details.

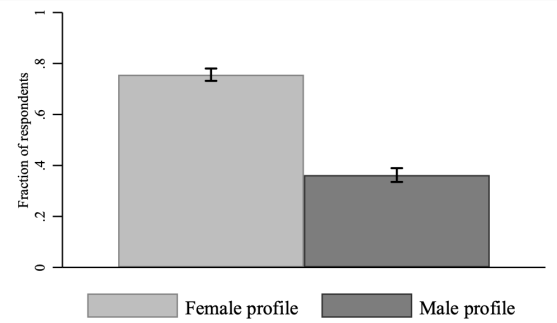
Figure B8: Anticipated discrimination in the vignette experiment, by respondent gender

(a) Student is likely to face discrimination (yes = 1)

(a.1) Female respondents

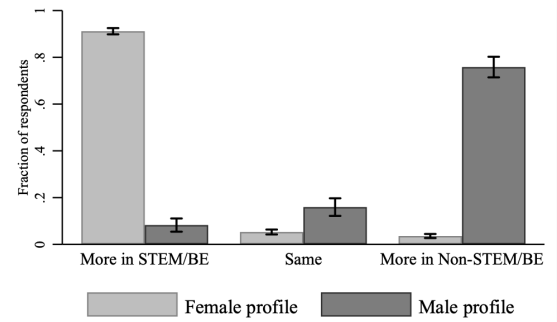


(a.2) Male respondents

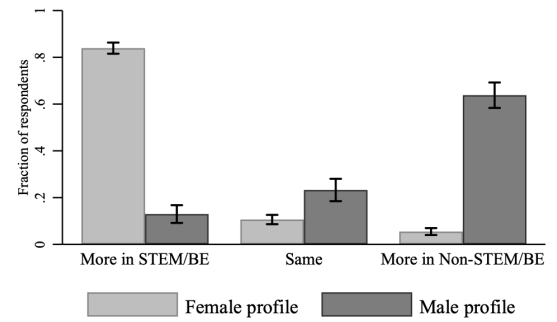


(b) Major in which student will face more discrimination

(b.1) Female respondents

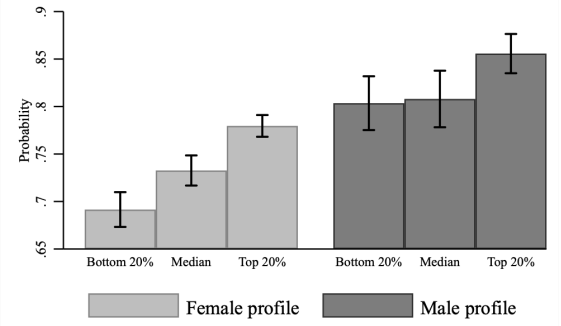


(b.2) Male respondents

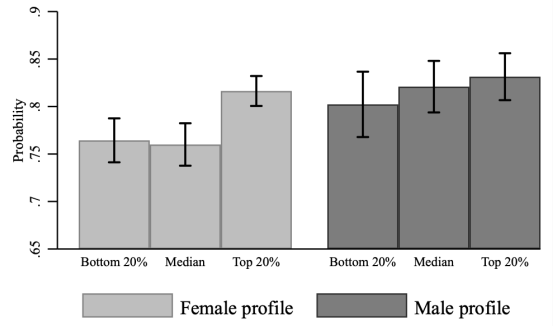


(c) Likelihood that the student can overcome discrimination

(c.1) Female respondents



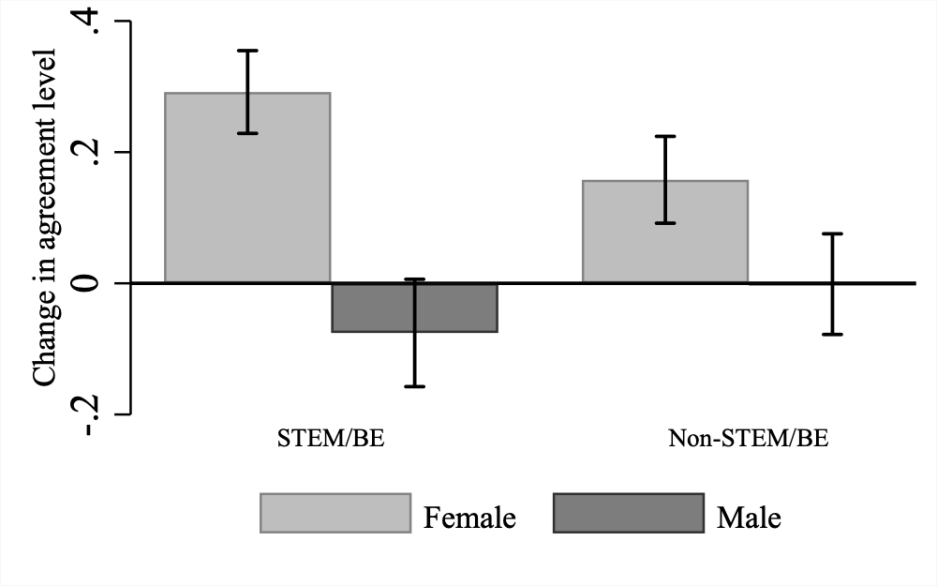
(c.2) Male respondents



Notes: The figure is computed using respondents' answers for each of the three student profiles presented to them. See Figure 4 for additional details.

B.1.2 Evidence from the counterfactual choice experiment

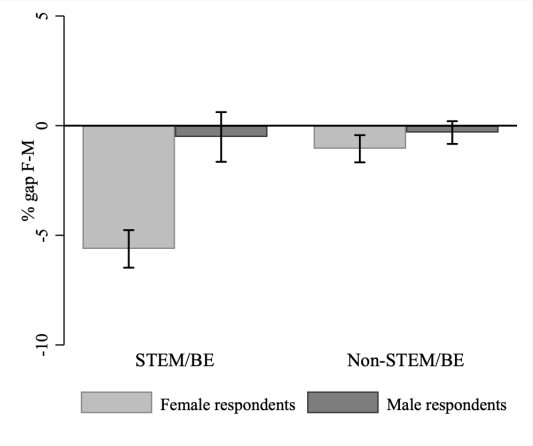
Figure B9: Change in anticipated labor market discrimination between enrollment and the time of the survey



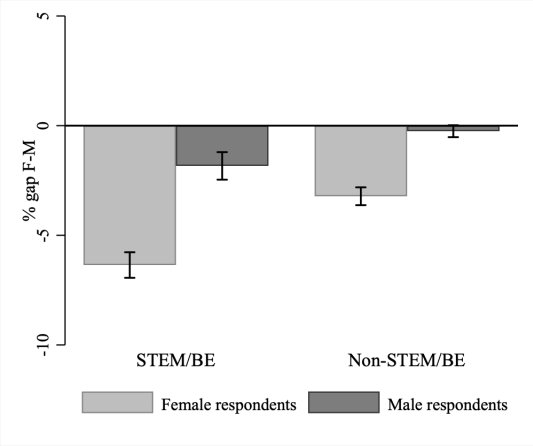
Notes: This figure plots the extent to which anticipated discrimination in the workplace changed since enrollment, separated by major category and respondent gender. Participants were asked to indicate their agreement level with the following statements both at the time of the survey and how they would have answered just before starting university: "In the workplace, you will face barriers or disadvantages because of your gender." The answer scale ranged from strongly disagree (-3) to strongly agree (3).

Figure B10: Anticipated discrimination in job offers and pay, weighted by likelihood of majoring in each category

(a) Expected gender gap in job offers

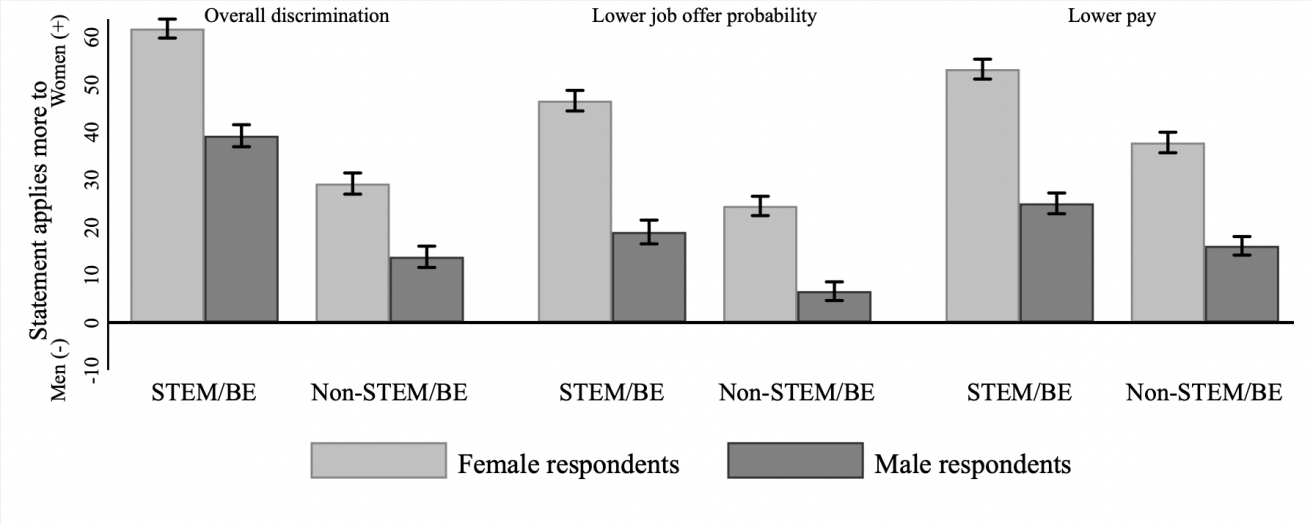


(b) Expected gender pay gap



Notes: This figure shows the gap in job offers and pay shown in Figure 6 multiplied by the probabilities that each respondent assigns to majoring in STEM/BE and non-STEM/BE. See Figure 6 for additional details.

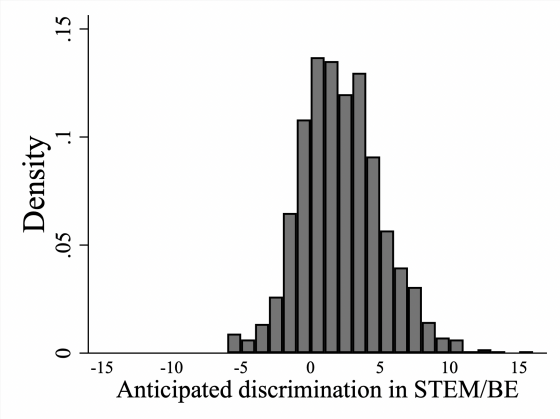
Figure B11: Which gender is expected to face more labor market discrimination



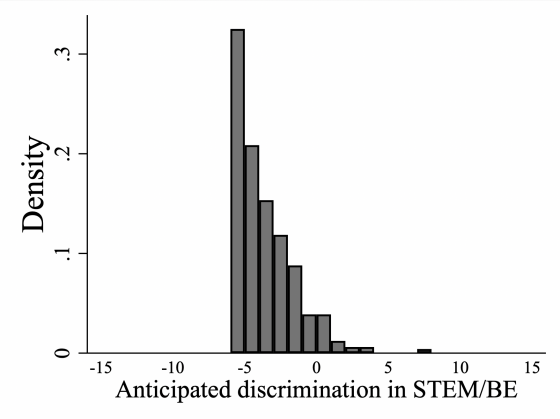
Notes: This figure shows whether respondents anticipate more labor market discrimination against women or men in each major category. Responses are on a scale from -100 to 100, where 100 indicates the statement is much more likely to apply to women, 0 indicates it is equally likely to apply to both, and -100 indicates it is much more likely to apply to men. The corresponding statements are: "They face additional barriers or disadvantages in the workplace because of their gender; They are less likely to receive a job offer compared to a similarly-qualified applicant of the opposite gender; They are paid less for doing the same work than a similarly-qualified worker of the opposite gender."

Figure B12: Anticipated discrimination index by major and gender

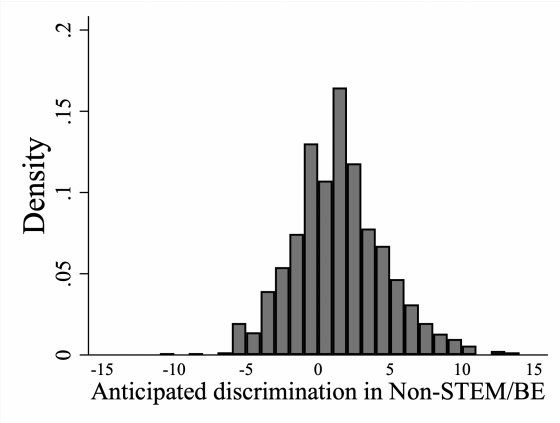
(a) Female respondents



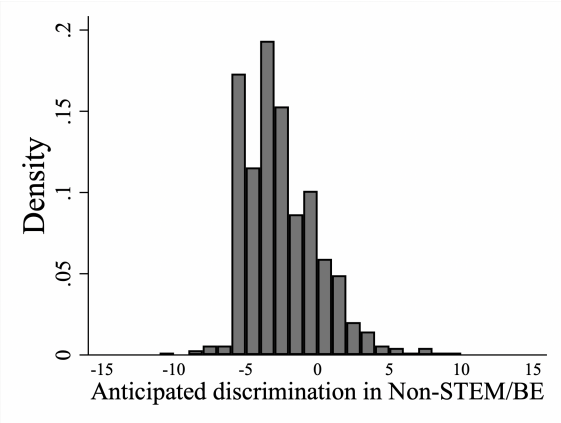
(b) Male respondents



(c) Female respondents



(d) Male respondents

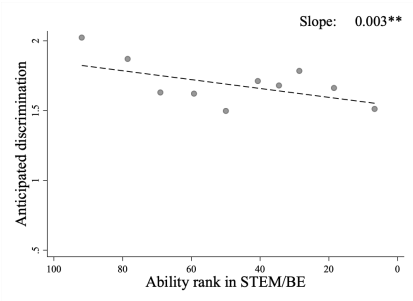


Notes: This figure plots the distribution of the anticipated discrimination index for respondents in STEM/BE and non-STEM/BE, by gender. See footnote 19 for details on the anticipated discrimination index and Table 2 as well as Figures 5 and 6 for corresponding survey questions.

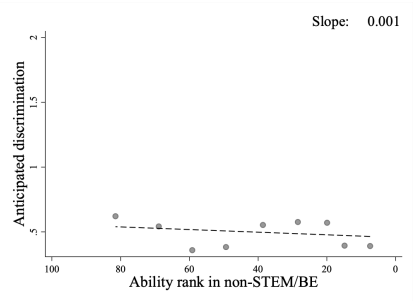
Figure B13: Anticipated discrimination and ability

(a) Level of agreement about facing discrimination

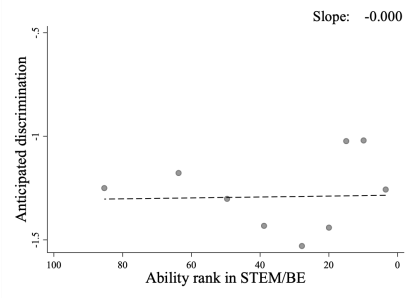
(a.1) Female respondents



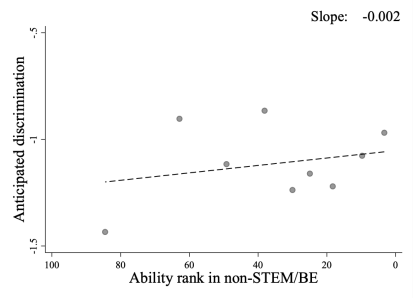
(a.2) Female respondents



(a.3) Male respondents

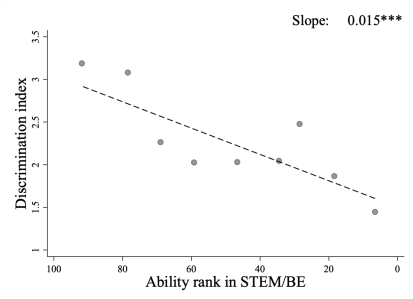


(a.4) Male respondents

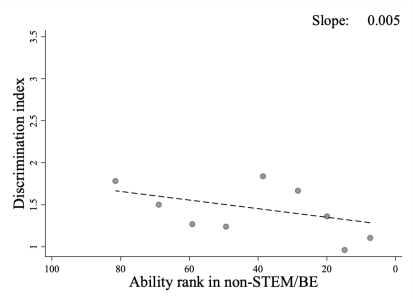


(b) Discrimination index

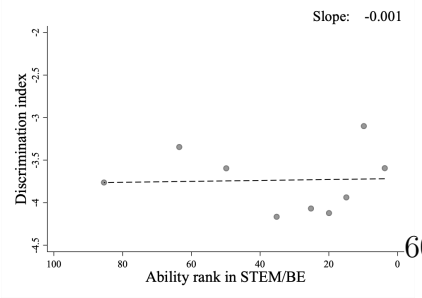
(b.1) Female respondents



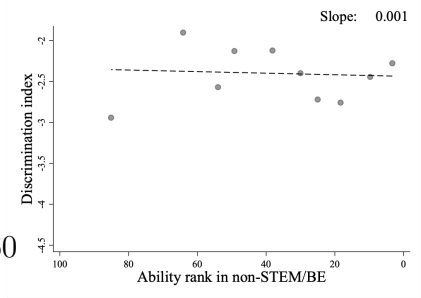
(b.2) Female respondents



(b.3) Male respondents



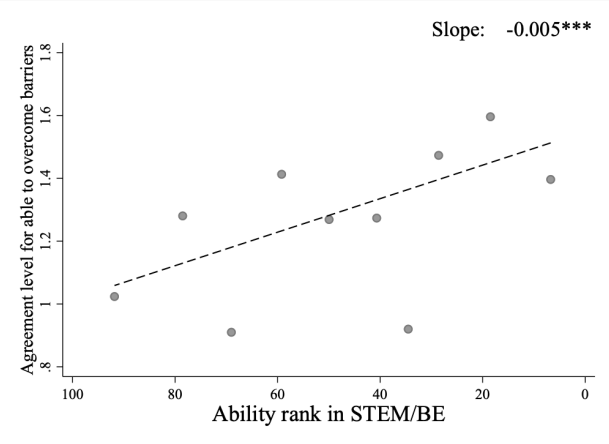
(b.4) Male respondents



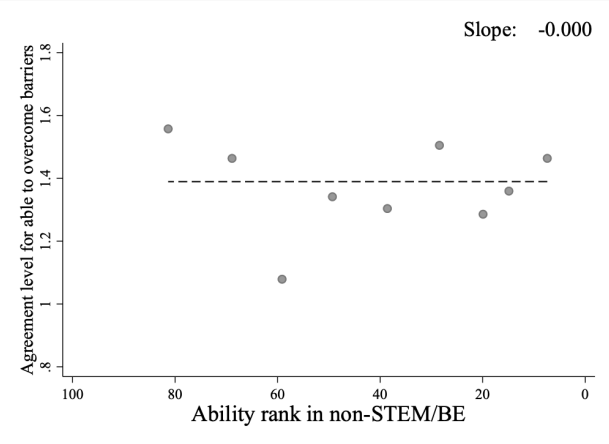
Notes: This figure plots the anticipated discrimination index of respondents in STEM/BE and non-STEM/BE against their self-assessed ability in each major category, where 1 is the top ability and 100 is the bottom, by respondent gender. See footnote 19 for a description of the anticipated discrimination index and Table 2 as well as Figures 5 and 6 for corresponding survey questions. See Table 2 for the survey question on ability.

Figure B14: Overcoming discrimination and ability

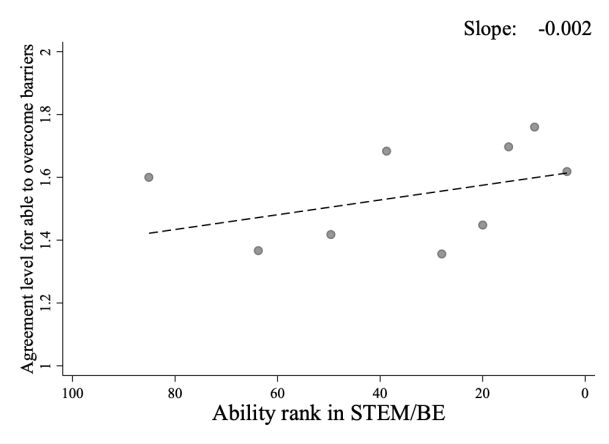
(a) Female participants



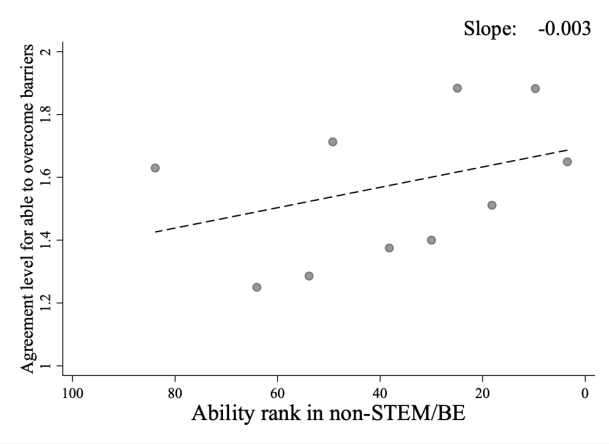
(b) Female participants



(c) Male participants



(d) Male participants



Notes: This figure plots the extent to which respondents expect being able to overcome discrimination, separately for STEM/BE and non-STEM/BE, against their self-assessed ability in each major category, where 1 is the top ability and 100 is the bottom, by respondent gender. The corresponding survey question for overcoming discrimination is: "If you face additional barriers or disadvantages in school or the workplace, you will be able to overcome them if you work hard enough and excel [-3 (Strongly disagree) to 3 (Strongly agree)]." See footnote 19 for a description of the anticipated discrimination index and Table 2 as well as Figures 5 and 6 for other corresponding survey questions. See Table 2 for the survey question on ability.

B.2 Tables

Table B1: Example quotes justifying different major recommendations for male and female profiles in the vignette experiment

1. *"Women are underrepresented in STEM and face discrimination in the field."*
2. *"Unfortunately misogyny is a very real problem in STEM fields and less so in non-STEM fields."*
3. *"It is more important for Jennifer to do well in STEM/BSE than non-STEM/BSE because she is a woman. This means she has to prove herself more than Mark, regardless of if they have the same bottom 20% placement. He is more likely to be accepted into jobs and earn more because of that identity."*
4. *"I assumed Mark was a man, and Jennifer making 82 cents to his dollar would impact recommendations."*
5. *"Gender bias in STEM/BE industries."*
6. *"Because Jennifer would be entering a male-dominated field where she would need to show she excels in order to see success."*

Notes: This table presents quotes from an open-ended question in the survey. Whenever a respondent was more or less likely to report that STEM/BE was a better choice for a female than a male profile of the same ability level, corresponding to the evidence shown in panel (a) of Figure 3, they were asked to explain why. The corresponding survey question was "Please briefly explain why you made different recommendations for [Student] compared to [Other student]." See Figure 3 for additional details.

Table B2: Anticipated discrimination index by respondent subgroup

	STEM/BE		**Non-STEM/BE**	
	Female	Male	Female	Male
	(1)	(2)	(3)	(4)
Overall	2.188	-3.735	1.442	-2.404
By subject interest				
High	1.941	-3.960	1.469	-2.636
Low	2.379	-3.436	1.409	-2.278
By ability				
High	2.039	-3.816	1.341	-2.524
Low	2.328	-3.562	1.542	-2.257
By gender composition of intended major within the major category				
Male dominated	2.331	-3.876	1.528	–2.605
Female dominated	2.082	-3.351	1.395	-2.013

Notes: This table summarizes the anticipated discrimination index by gender and major category. "By subject interest" further separates respondents into whether they report interest in STEM/BE or non-STEM/BE content at a value above (below) the median level. "By ability" further separates respondents into whether they report ranking below (above) the median level of ability in each major category. "By gender composition of intended major within the major category" further separates respondents into whether the major they would most likely choose within STEM/BE and non-STEM/BE has a female ratio below (above) the median female ratio across all majors. See footnote 19 for details on the anticipated discrimination index and Table 2 as well as Figures 5 and 6 for corresponding survey questions.

Table B3: Anticipated discrimination and intended major choice, additional controls

	Perceived ability		**Preference for peers' gender**		**Expected salary at 30**	
	STEM/BE	Non-STEM/BE	STEM/BE	Non-STEM/BE	STEM/BE	Non-STEM/BE
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-15.724***	12.627***	-12.636***	7.115**	-12.057***	7.364***
	(3.387)	(2.396)	(3.866)	(2.794)	(3.831)	(2.717)
AD index	5.894**	2.187	4.220	2.764	4.413	3.447
	(2.662)	(2.023)	(2.982)	(2.295)	(2.983)	(2.280)
Female × AD index	-8.464***	1.577	-8.629**	2.682	-8.697**	1.942
	(2.945)	(2.352)	(3.378)	(2.731)	(3.379)	(2.714)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,054	2,054	1,262	1,262	1,262	1,262
Outcome mean	71.337	36.298	77.662	29.396	77.662	29.396

Notes: Control variables differ from those in Table 3: columns 1 and 2 control for self-assessed ability instead of SAT scores. See Table 2 for the survey question on ability. Columns 3 and 4 further control for peer preferences elicited from the following survey question: "Please answer to what extent you agree with the following statement: It is important to have others of your gender in your classes and in the workplace in order to have people to relate to, develop a sense of belonging, or create a better culture". The answer scale ranged from strongly disagree (0) to strongly agree (100). Columns 5 and 6 further control for salary expectations. See Table 2 for the survey question on salary expectations. See Table 3 for additional details. Standard errors are reported in parentheses, and ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B4: Impact of controlling for different factors on the gender gap in intentions to major in STEM/BE

	(1)	(2)	(3)	(4)
Female	-17.289***	-10.486***	-9.426***	-8.745***
	(2.104)	(2.938)	(2.495)	(2.488)
Expected salary at 30	2.434***	2.433***	1.641**	1.420**
	(0.841)	(0.839)	(0.713)	(0.712)
AD index		-4.485***	-1.302	-1.021
		(1.355)	(1.156)	(1.153)
Subject interest			21.817***	20.915***
			(0.775)	(0.798)
Perceived rank				-3.407***
				(0.762)
Controls	Yes	Yes	Yes	Yes
Observations	2,054	2,054	2,054	2,054
Outcome mean	71.337	71.337	71.337	71.337

Notes: This table presents estimates from an OLS regression of the probability of a student majoring in STEM/BE. The variable "Female" is a binary indicator, taking the value of one if the student self-identifies as female and zero if male. Control variables include respondents' responses regarding the likelihood of the career providing good non-monetary benefits, and weekly studying hours in order to do well. See footnote 19 for details on the anticipated discrimination index and Table 2 as well as Figures 5 and 6 for corresponding survey questions. Expected salary at 30 is a standardized measure of respondents' responses regarding expected salary at age 30, with a mean of 0 and a standard deviation of 1. Subject interest and perceived rank are also standardized to have a mean of 0 and a standard deviation of 1. Standard errors are reported in parentheses, and ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B5: Anticipated discrimination and first-term STEM/BE courses

	Fraction of first term STEM/BE courses			
	(1)	(2)	(3)	(4)
Female	-0.226***	-0.210***	-0.208***	-0.220***
	(0.030)	(0.038)	(0.028)	(0.034)
AD index	0.017	0.037		
	(0.024)	(0.030)		
Female × AD index	-0.058**	-0.057*		
	(0.028)	(0.034)		
Economic outcomes index			0.012	0.042**
			(0.015)	(0.020)
Female × Economic outcomes index			-0.034**	-0.053**
			(0.017)	(0.022)
Workplace conditions index			0.009	0.039**
			(0.015)	(0.020)
Female × Workplace conditions index			-0.030*	-0.049**
			(0.017)	(0.022)
Sexual harassment			-0.016	-0.017
			(0.021)	(0.024)
Female × Sexual harassment			0.006	0.014
			(0.024)	(0.029)
Controls		Yes		Yes
Observations	1,981	1,218	1,981	1,218
Outcome mean	0.519	0.572	0.519	0.572

Notes: This table presents estimates from an OLS regression of the fraction of STEM/BE courses taken by survey respondents in their first term at the university on anticipated discrimination. The fraction of STEM/BE courses is calculated from a student's transcript data and linked to their survey responses regarding anticipated discrimination. See Table 3 for additional details.

C - Student survey

Figure B15: Sample vignette

You will next be presented with a hypothetical scenario and asked some questions about it.

Jennifer, Mark, and Emma are in their first year and considering whether to pursue a major in a STEM/BE or non-STEM/BE field. They are all equally interested in pursuing a career in either category of majors and plan to work full-time after graduating.

Jennifer and Mark have both been told that they would rank in the **bottom 20%** of students for either category of majors, based on their performance in high school and college entrance exams. They also both feel that their preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

In contrast, **Emma** has been told that she would rank in the **top 20%** of students for either category of majors, again based on her performance in high school and college entrance exams. She also feels that her preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

Figure B16: Introduction of anticipated discrimination

In the media and public discourse, it is sometimes discussed that some students may face additional barriers or disadvantages in certain career paths, for example because of how they are perceived or treated given stereotypes associated with their gender. For instance, several majors in STEM/BE are typically considered stereotypically male, in part given the high relative fraction of male students who graduate in them, while several majors in non-STEM/BE are typically considered stereotypically female. Jennifer, Mark, and Emma are concerned about potential discrimination they may face depending on the major they select.

C.1 - Full student survey

Anticipated discrimination and major choice - 2024

Start of Block: Intro

consent Please indicate your agreement to participate in this research study:

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Please indicate your agreement to participate in this research study: = No

End of Block: Intro

Start of Block: Screening

Timing1 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

JS

Qscreening .Skin #Logo { display:none; } Which school year are you in currently?

- ○ Freshman (1)
- ○ Sophomore (2)
- ○ Junior (3)
- ○ Senior (4)

Display This Question:

If Which school year are you in currently? = Junior

Or Which school year are you in currently? = Senior

Qscreen_end Thank you for your interest. You are not eligible to take the survey. Only freshmen or sophomores are supposed to take the survey.

Skip To: End of Survey If Thank you for your interest. You are not eligible to take the survey. Only freshmen or sophomores... Displayed

End of Block: Screening

Start of Block: Demo

Timing_demo Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)



Q1.2 .Skin #Logo { display:none; } What is your country of birth?

▼ Afghanistan (1) ... Other (1358)

Q1.3 Please state the gender with which you identify.

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)
- ○ Prefer to self-describe (5) _____

Page Break

Q1.4 .Skin #Logo { display:none; } What is your cumulative grade point average (GPA)? Please round up to the nearest tenth.

0 1 1 2 2 3 3 4

() 

Q1.5 .Skin #Logo { display:none; } When do you expect to graduate from the university? (1)

▼ WINTER 2025 (1) ... Before WINTER 2025 (10)

Q1.6 What were your scores on the SAT? (Please enter a number between 200 and 800. Please skip this question if you did not take the SAT.)

- Verbal (1) _____
- Math (2) _____

Q1.7 What was your composite score on the ACT? (Please enter a number between 1 and 36. Round up your score to the nearest integer. Please skip this question if this is not applicable to you.)

- Overall (1) _____
- Math (2) _____

*

Q1.81 What was your rank in your high school graduating class? Please write a number between 1 and 100, where 1 means you ranked in the top 1%. Note that 100 means the lowest rank. If your school did not rank graduating classes then please estimate your ranking as best you can.

- (2) _____

Page Break

Q1.9 .Skin #Logo { display:none; } Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please select a number between 1 and 7 where 1 means “absolutely unwilling to take risks” and 7 means “fully prepared to take risks”.

1 2 3 4 5 6 7



Page Break

percent_intro .Skin #Logo { display:none; } In some of the following questions, you will be asked about the PERCENT CHANCE of something happening. The percent chance must be a number between 0 and 100.

Numbers like 2 or 5% indicate "almost no chance".
Numbers like 19% or so may mean "not much chance".
Numbers like 47 or 55% chance may be a "pretty even chance".
Numbers like 82% or so indicates a "very good chance".
Numbers like 95 or 98% mean "almost certain".

The percent chance can also be thought of as the number of chances out of 100.

Q1.10 How likely is it that you will pursue a post-bachelor's degree (such as a MD, PhD, Masters, etc.) at some point after graduating from X?

0 10 20 30 40 50 60 70 80 90 100



End of Block: Demo

Start of Block: Graduating

Timing_grad Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

JS

stembe_intro .Skin #Logo { display:none; } In this survey, we will ask you about majors in STEM, Business, and Economics (STEM/BE) fields versus majors in other fields (Non-STEM/BE).

By **STEM/BE** fields, we mean majors in "Science, Technology, Engineering, and Math" OR in Business and Economics.
By **Non-STEM/BE** fields, we mean all other majors, many of which are in the humanities, arts, public health, other social sciences, etc.

Here is a list of the ten most popular majors for these two major categories:

STEM/BE	**Non-STEM/BE**
Computer Science	Business Administration
Economics	
Mechanical Engineering	
Biopsychology, Cognition, and Neuroscience	
Neuroscience	
Industrial & Operations Engineering	
Chemical Engineering	
Aerospace Engineering	
Biomolecular Science	Psychology
Political Science	
Nursing	
International Studies	
Communication	
English	
Sport Management	
History	
Public Policy	
Art and Design	

Click here to see a full list of majors in each category, classified according to the university guidelines.

Q2.1 What do you think is the percent chance (or chances out of 100) that you will graduate with a major in **STEM/BE**?

0 10 20 30 40 50 60 70 80 90 100

()



Q2.1b What do you think is the percent chance (or chances out of 100) that you will graduate with a minor in **STEM/BE**?

0 10 20 30 40 50 60 70 80 90 100

() 

Display This Question:

If What do you think is the percent chance (or chances out of 100) that you will graduate with a maj... [ ] > 0

Q2.1.1 .Skin #Logo { display:none; } If you were to graduate with a major in **STEM/BE**, what do you think is the most likely major in **STEM/BE** that you think you would graduate with?

Display This Question:

If If you were to graduate with a major in STEM/BE, what do you think is the most likely major in ST... Displayed

Q2.1.1.1 Top major choice.
(1)

▼ Actuarial Mathematics (1) ... Structural Biology Track (47)

Q2.2 What do you think is the percent chance (or chances out of 100) that you will graduate with a major in **non-STEM/BE**?

0 10 20 30 40 50 60 70 80 90 100

() 

Q2.2b What do you think is the percent chance (or chances out of 100) that you will graduate with a minor in **non-STEM/BE**?

0 10 20 30 40 50 60 70 80 90 100

()	

Display This Question:

If What do you think is the percent chance (or chances out of 100) that you will graduate with a maj... [ ] > 0

Q2.2.1 If you were to graduate with a major in **non-STEM/BE**, what do you think is the most likely major in **non-STEM/BE** that you think you would graduate with?

Display This Question:

If If you were to graduate with a major in non-STEM/BE, what do you think is the most likely major i... Displayed

Q2.2.1.1 Top major choice.
(1)

▼ Afroamerican and African Studies (1) ... Women's and Gender Studies (87)

Q877 **We would like to know how these percent chances have changed since enrolling into UM.**

Q878 Just before starting university, the percent chance (or chances out of 100) that you thought you would graduate with a major in **STEM/BE** was

	0	10	20	30	40	50	60	70	80	90	100
()											

Q879 Just before starting university, the percent chance (or chances out of 100) that you thought you would graduate with a major in **non-STEM/BE** was

0	10	20	30	40	50	60	70	80	90	100

()



End of Block: Graduating

Start of Block: incentivized_female_ratio

JS

Q456 Please answer carefully. For each of the following two questions, if your answer is within 2 points of the true proportion, you will receive an additional $0.5.

Q2.3.1 Of all the university bachelor's students who graduated with a major in **STEM/BE** in the last two years, what proportion (out of 100) do you think were **women**?

0 10 20 30 40 50 60 70 80 90 100

()



Q2.3b.1 Of all the university bachelor's students who graduated with a major in **non-STEM/BE** in the last two years, what proportion (out of 100) do you think were **women**?

0 10 20 30 40 50 60 70 80 90 100

()



End of Block: incentivized_female_ratio

Start of Block: nonincentivized_female_ratio

JS

Q2.3.2 .Skin #Logo { display:none; } Of all the university bachelor's students who graduated with a major in **STEM/BE** in the last two years, what proportion (out of 100) do you think were **women**?

0 10 20 30 40 50 60 70 80 90 100

()



Q2.3b.2 Of all the university bachelor's students who graduated with a major in **non-STEM/BE** in the last two years, what proportion (out of 100) do you think were **women**?

0 10 20 30 40 50 60 70 80 90 100

() 

End of Block: nonincentivized_female_ratio

Start of Block: stem_interest

JS

Q2.4 .Skin #Logo { display:none; } Do you have close friends or immediate family members who have majored or are planning to major in **STEM/BE**? Please select all that apply.

- ☐ Yes, at least one close friend (6)
- ☐ Yes, at least one immediate family member (7)
- ☐ Neither (8)

Q2.4b Do you have close friends or immediate family members who have majored or are planning to major in **non-STEM/BE**? Please select all that apply.

- ☐ Yes, at least one close friend (8)
- ☐ Yes, at least one immediate family member (9)
- ☐ Neither (10)

Q2.5 Have you ever researched or looked up information about any of the following? Please select all that apply.

- ☐ Studying in STEM/BE (1)
- ☐ Studying in non-STEM/BE (2)
- ☐ Working in a career related to STEM/BE (3)
- ☐ Working in a career related to non-STEM/BE (4)
- ☐ None (5)

Page Break

Qattention .Skin #Logo { display:none; } To show that you read our questions carefully, please choose both “Very strongly interested” and “Not at all interested” as your answer in the next question.

How interested are you in sports?

- ☐ Very strongly interested (1)
- ☐ Very interested (2)
- ☐ A little bit interested (3)
- ☐ Almost not interested (4)
- ☐ Not at all interested (5)

End of Block: stem_interest

Start of Block: expectation

JS

Q3.2 .Skin #Logo { display:none; } If you were to graduate in each of these major categories, what do you think is the percent chance that you could **find a good job within 6 months of graduating**?

	0 10 20 30 40 50 60 70 80 90 100
STEM/BE ()	
Non-STEM/BE ()	

JS *

Q3.1 .Skin #Logo { display:none; } If you were to graduate in each of these major categories, what do you think would be **your annual salary** if you worked full-time **at age 30**?

Full-time means working 35 hours or more each week for around 48 weeks each year. When answering, assume a dollar when you are 30 is worth a dollar today, i.e., ignore the effects of inflation.
(Please write your answer in thousands of dollars. For example, if you think your annual salary would be $50,000, write '50'.)

- STEM/BE (1) _____
- Non-STEM/BE (2) _____

Page Break

*

Q3.3 .Skin #Logo { display:none; } If you were to graduate in each of these major categories, where do you think you would **rank in terms of ability** among the university graduates of that major category? Please write a number between 1 and 100, where 1 means the best (i.e., among the top 1%) and 100 means the lowest.

- STEM/BE (1) _____
- Non-STEM/BE (4) _____

Q3.4 If you were to major in each of these categories, what is the **average number of hours** that you think you would have to spend **studying per week** in order to do well in the major?

- STEM/BE (1) _____
- Non-STEM/BE (2) _____

Q3.7 If you were to graduate in each of these major categories, how important do you think it would be for you to **earn high grades and distinguish yourself from others** to have a successful career?

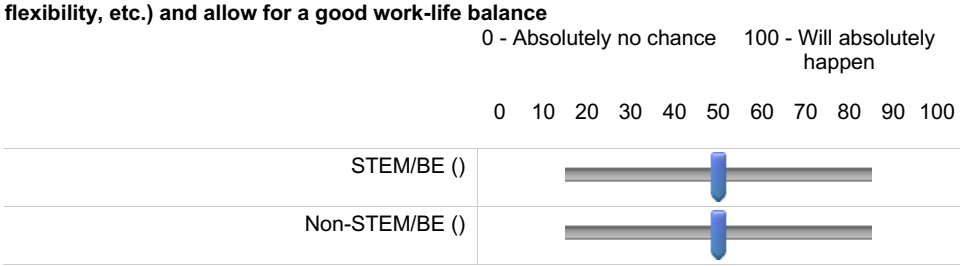
	0 - Absolutely not important	100 - Absolutely Important
STEM/BE ()		
Non-STEM/BE ()		

Page Break

Q3.61 .Skin #Logo { display:none; } How likely are the following to happen if you major in each category?

The subject content related to courses and careers will be interesting	0 - Absolutely no chance	100 - Will absolutely happen
	0 10 20 30 40 50 60 70 80 90 100	
STEM/BE ()		
Non-STEM/BE ()		

Q3.62 **The career will provide good non-monetary benefits (working conditions, schedule flexibility, etc.) and allow for a good work-life balance**



End of Block: expectation

[Sample block]

Start of Block: 2F1M_1H2L

JS

Q458 .Skin #Logo { display:none; } You will next be presented with a hypothetical scenario and asked some questions about it.

Q459 **Jennifer, Mark, and Emma** are in their first year at the university and considering whether to pursue a major in a STEM/BE or non-STEM/BE field. They are all equally interested in pursuing a career in either category of majors and plan to work full-time after graduating.

Jennifer and Mark have both been told that they would rank in the **bottom 20%** of students for either category of majors, based on their performance in high school and college entrance exams. They also both feel that their preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

In contrast, **Emma** has been told that she would rank in the **top 20%** of students for either category of majors, again based on her performance in high school and college entrance exams. She also feels that her preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

Q486 To make sure you understand the key components of this scenario, please answer the following questions.

Q460 Please tell us whether the following statement is True or False.

	True (1)	False (2)
Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. (4)	○	○

Q485 How would the following students rank in each category of majors, based on their performance in high school and college entrance exams?

	Bottom 20% (1)	Top 20% (2)
Jennifer and Mark in STEM/BE (1)	○	○
Jennifer and Mark in non-STEM/BE (2)	○	○
Emma in STEM/BE (3)	○	○
Emma in non-STEM/BE (4)	○	○

Display This Question:

If Please tell us whether the following statement is True or False. : != Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [True]

And How would the following students rank in each category of majors, based on their performance in h... = Jennifer and Mark in STEM/BE [Bottom 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Jennifer and Mark in non-STEM/BE [Bottom 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Emma in STEM/BE [Top 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Emma in non-STEM/BE [Top 20%]

Q461 .Skin #Logo { display:none; } Your answers are **not completely correct**. Please try again.

Jennifer, Mark, and Emma are in their first year at the university and considering whether to pursue a major in a STEM/BE or non-STEM/BE field. They are all equally interested in pursuing a career in either category of majors and plan to work full-time after graduating.

Jennifer and Mark have both been told that they would rank in the **bottom 20%** of students for either category of majors, based on their performance in high school and college entrance exams. They also both feel that their preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

In contrast, **Emma** has been told that she would rank in the **top 20%** of students for either category of majors, again based on her performance in high school and college entrance exams. She also feels that her preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

To make sure you understand the key components of this scenario, please tell us whether the following statement is True or False.

	True (1)	False (2)
Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. (4)	○	○

Display This Question:

If How would the following students rank in each category of majors, based on their performance in h... != Jennifer and Mark in STEM/BE [Bottom 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Jennifer and Mark in non-STEM/BE [Bottom 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Emma in STEM/BE [Top 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Emma in non-STEM/BE [Top 20%]

And If

Please tell us whether the following statement is True or False. : = Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [True]

Q487 .Skin #Logo { display:none; } Your answers are **not completely correct**. Please try again.

Jennifer, Mark, and Emma are in their first year at the university and considering whether to pursue a major in a STEM/BE or non-STEM/BE field. They are all equally interested in pursuing a

career in either category of majors and plan to work full-time after graduating.

Jennifer and Mark have both been told that they would rank in the **bottom 20%** of students for either category of majors, based on their performance in high school and college entrance exams. They also both feel that their preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

In contrast, **Emma** has been told that she would rank in the **top 20%** of students for either category of majors, again based on her performance in high school and college entrance exams. She also feels that her preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

To make sure you understand the key components of this scenario, please tell us how the following students would rank in each category of majors, based on their performance in high school and college entrance exams.

	Bottom 20% (1)	Top 20% (2)
Jennifer and Mark in STEM/BE (1)	○	○
Jennifer and Mark in non-STEM/BE (2)	○	○
Emma in STEM/BE (3)	○	○
Emma in non-STEM/BE (4)	○	○

Display This Question:

If How would the following students rank in each category of majors, based on their performance in h... != Jennifer and Mark in STEM/BE [Bottom 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Jennifer and Mark in non-STEM/BE [Bottom 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Emma in STEM/BE [Top 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Emma in non-STEM/BE [Top 20%]

And If

Please tell us whether the following statement is True or False. : != Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [True]

Q488 .Skin #Logo { display:none; } Your answers are **not completely correct**. Please try again.

Jennifer, Mark, and Emma are in their first year at the university and considering whether to pursue a major in a STEM/BE or non-STEM/BE field. They are all equally interested in pursuing a career in either category of majors and plan to work full-time after graduating.

Jennifer and Mark have both been told that they would rank in the **bottom 20%** of students for either category of majors, based on their performance in high school and college entrance exams. They also both feel that their preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

In contrast, **Emma** has been told that she would rank in the **top 20%** of students for either category of majors, again based on her performance in high school and college entrance exams. She also feels that her preparation so far has been equally suitable for studying in STEM/BE or non-STEM/BE.

To make sure you understand the key components of this scenario, please answer the following questions.

Please tell us whether the following statement is True or False.

	True (1)	False (2)
Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. (4)	○	○

Display This Question:

If How would the following students rank in each category of majors, based on their performance in h... != Jennifer and Mark in STEM/BE [Bottom 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Jennifer and Mark in non-STEM/BE [Bottom 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Emma in STEM/BE [Top 20%]

Or How would the following students rank in each category of majors, based on their performance in h... != Emma in non-STEM/BE [Top 20%]

And If

Please tell us whether the following statement is True or False. : != Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [True]

Q489 How would the following students rank in each category of major, based on their performance in high school and college entrance exams?

	Bottom 20% (1)	Top 20% (2)
Jennifer and Mark in STEM/BE (1)	○	○
Jennifer and Mark in non-STEM/BE (2)	○	○
Emma in STEM/BE (3)	○	○
Emma in non-STEM/BE (4)	○	○

Display This Question:

If Please tell us whether the following statement is True or False. : = Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [True]

And How would the following students rank in each category of majors, based on their performance in h... = Jennifer and Mark in STEM/BE [Bottom 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Jennifer and Mark in non-STEM/BE [Bottom 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Emma in STEM/BE [Top 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Emma in non-STEM/BE [Top 20%]

Or If

Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... : = Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [True]

Or If

Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Jennifer and Mark in STEM/BE [Bottom 20%]

And Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Jennifer and Mark in non-STEM/BE [Bottom 20%]

And Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Emma in STEM/BE [Top 20%]

And Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Emma in non-STEM/BE [Top 20%]

Or If

Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... : = Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [True]

And How would the following students rank in each category of major, based on their performance in hi... = Jennifer and Mark in STEM/BE [Bottom 20%]

And How would the following students rank in each category of major, based on their performance in hi... = Jennifer and Mark in non-STEM/BE [Bottom 20%]

And How would the following students rank in each category of major, based on their performance in hi... = Emma in STEM/BE [Top 20%]

And How would the following students rank in each category of major, based on their performance in hi... = Emma in non-STEM/BE [Top 20%]

Q462 .Skin #Logo { display:none; } Well done! Your answers are **correct**.

Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories: True

Jennifer and Mark would rank in the **bottom 20%** of students in both STEM/BE and non-STEM/BE.

Emma would rank in the **top 20%** of students in both STEM/BE and non-STEM/BE.

Display This Question:

If Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... : = Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [False]

And How would the following students rank in each category of majors, based on their performance in h... = Jennifer and Mark in STEM/BE [Bottom 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Jennifer and Mark in non-STEM/BE [Bottom 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Emma in STEM/BE [Top 20%]

And How would the following students rank in each category of majors, based on their performance in h... = Emma in non-STEM/BE [Top 20%]

Or If

Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Jennifer and Mark in STEM/BE [Top 20%]

Or Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Jennifer and Mark in non-STEM/BE [Top 20%]

Or Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Emma in STEM/BE [Bottom 20%]

Or Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... = Emma in non-STEM/BE [Bottom 20%]

Or If

Your answers are not completely correct. Please try again. Jennifer, Mark, and Emma are in their... : = Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories. [False]

Or How would the following students rank in each category of major, based on their performance in hi... = Jennifer and Mark in STEM/BE [Top 20%]

Or How would the following students rank in each category of major, based on their performance in hi... = Jennifer and Mark in non-STEM/BE [Top 20%]

Or How would the following students rank in each category of major, based on their performance in hi... = Emma in STEM/BE [Bottom 20%]

Or How would the following students rank in each category of major, based on their performance in hi... = Emma in non-STEM/BE [Bottom 20%]

Q463 .Skin #Logo { display:none; } Your answers are **not completely correct**. Please read the following explanations carefully.

Jennifer, Mark, and Emma are equally interested in STEM/BE and non-STEM/BE careers and their preparation so far has focused evenly on both major categories: True

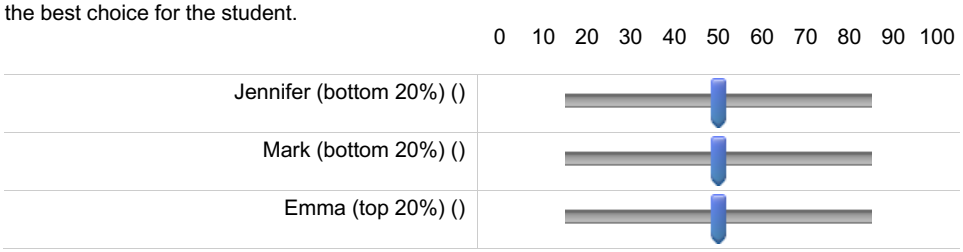
Jennifer and Mark would rank in the **bottom 20%** of students in both STEM/BE and non-STEM/BE.

Emma would rank in the **top 20%** of students in both STEM/BE and non-STEM/BE.

Page Break

Q464 .Skin #Logo { display:none; } Please answer the following questions based on the information you have been given about each student as well as the conditions you believe each student is likely to face when graduating in certain majors. To help you remember each student's potential rank relative to other students in their major, we will indicate (top 20%) or (bottom 20%) next to their name for the rest of this section.

To what extent do you think that majoring in STEM/BE (as opposed to non-STEM/BE) would be the best choice for each student? Note that 0 would mean that you absolutely do not think that majoring in STEM/BE would be the best choice for the student (and so they should definitely major in non-STEM/BE). On the other hand, 100 would mean that you think that majoring in STEM/BE would be the best choice for the student.



Q469 In which major category would it be more difficult for Jennifer, Mark, and Emma to **have a successful career**?

	Much more difficult in non-STEM/BE (5)	Moderately more difficult in non-STEM/BE (7)	Slightly more difficult in non-STEM/BE (4)	Equally difficult (3)	Slightly more difficult in STEM/BE (2)	Moderately more difficult in STEM/BE (6)	Much more difficult in STEM/BE (1)
Jennifer (bottom 20%) (1)	○	○	○	○	○	○	○
Mark (bottom 20%) (2)	○	○	○	○	○	○	○
Emma (top 20%) (3)	○	○	○	○	○	○	○

Q470 In which major category would it be more important for Jennifer, Mark, and Emma to **obtain good grades and distinguish themselves** from others to help their careers?

	Much more important in non-STEM/BE (1)	Moderately more important in non-STEM/BE (6)	Slightly more important in non-STEM/BE (2)	Equally important (3)	Slightly more important in STEM/BE (4)	Moderately more important in STEM/BE (7)	Much more important in STEM/BE (5)
Jennifer (bottom 20%) (1)	○	○	○	○	○	○	○
Mark (bottom 20%) (2)	○	○	○	○	○	○	○
Emma (top 20%) (3)	○	○	○	○	○	○	○

Page Break

Display This Question:

If Please answer the following questions based on the information you have been given about each stu... [Jennifer (bottom 20%)] >= $e{ q://QID464/ChoiceNumericEntryValue/2 + 5}

Or Please answer the following questions based on the information you have been given about each stu... [Jennifer (bottom 20%)] <= $e{ q://QID464/ChoiceNumericEntryValue/2 - 5}

Q466 .Skin #Logo { display:none; } Please briefly explain why you made different recommendations for Jennifer (bottom 20%) compared to Mark (bottom 20%).

_____

Display This Question:

If Please answer the following questions based on the information you have been given about each stu... [Jennifer (bottom 20%)] >= $e{q://QID464/ChoiceNumericEntryValue/3 + 5}

Or Please answer the following questions based on the information you have been given about each stu... [Jennifer (bottom 20%)] <= $e{q://QID464/ChoiceNumericEntryValue/3 -5}

Q467 .Skin #Logo { display:none; } Please briefly explain why you made different recommendations for Emma (top 20%) compared to Jennifer (bottom 20%).

_____

Page Break

Q473 .Skin #Logo { display:none; } In the media and public discourse, it is sometimes discussed that some students may face additional barriers or disadvantages in certain career paths, for example because of how they are perceived or treated given stereotypes associated with their gender. For instance, several majors in STEM/BE are typically considered stereotypically male, in part given the high relative fraction of male students who graduate in them, while several majors in non-STEM/BE are typically considered stereotypically female. Jennifer, Mark, and Emma are concerned about potential discrimination they may face depending on the major they select.

Q662 Do you think there is at least one category of majors in which Jennifer, Mark, or Emma are likely to face additional barriers or disadvantages because of their gender?

	Yes (1)	No (2)
Jennifer (bottom 20%) (1)	○	○
Mark (bottom 20%) (2)	○	○
Emma (top 20%) (3)	○	○

Q476 How much did concerns of discrimination or differential treatment factor in your previous answer about whether majoring in STEM/BE or non-STEM/BE would be the best choice for Jennifer, Mark, and Emma?

	Not at all (3)	A little (4)	A moderate amount (5)	A lot (6)	A great deal (8)
Jennifer (bottom 20%) (1)	○	○	○	○	○
Mark (bottom 20%) (2)	○	○	○	○	○
Emma (top 20%) (3)	○	○	○	○	○

Display This Question:

If Do you think there is at least one category of majors in which Jennifer, Mark, or Emma are likely... = Jennifer (bottom 20%) [Yes]

Q474 .Skin #Logo { display:none; } You said that Jennifer would be likely to face additional barriers or disadvantages because of her gender. In which major category would Jennifer be more likely to face additional barriers or disadvantages?

	Much more likely in non-STEM/BE (1)	Moderately more likely in non-STEM/BE (7)	Slightly more likely in non-STEM/BE (2)	Equally likely (3)	Slightly more likely in STEM/BE (4)	Moderately more likely in STEM/BE (6)	Much more likely in STEM/BE (5)
Jennifer (bottom 20%) (1)	○	○	○	○	○	○	○

Display This Question:

If Do you think there is at least one category of majors in which Jennifer, Mark, or Emma are likely... = Jennifer (bottom 20%) [Yes]

Q475 Now consider STEM/BE and non-STEM/BE majors together. How likely do you think it is that Jennifer could overcome these additional barriers or disadvantages by working hard and excelling?

0 - Absolutely no chance 100 - Will absolutely happen

0 10 20 30 40 50 60 70 80 90 100

Jennifer (bottom 20%) ()	

Display This Question:

If You said that Jennifer would be likely to face additional barriers or disadvantages because of he... = Much more likely in STEM/BE

Or You said that Jennifer would be likely to face additional barriers or disadvantages because of he... = Slightly more likely in STEM/BE

Or You said that Jennifer would be likely to face additional barriers or disadvantages because of he... = Moderately more likely in STEM/BE

Q880 .Skin #Logo { display:none; } In light of Jennifer's concerns and your own views regarding possible barriers and disadvantages due to one's gender in different fields, what would be your overall recommendation?

- ○ Jennifer should avoid choosing STEM/BE, because she is more likely to face additional barriers or disadvantages because of her gender in STEM/BE (1)
- ○ Jennifer should choose STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in STEM/BE (6)

Display This Question:

If In light of Jennifer's concerns and your own views regarding possible barriers and disadvantages... = Jennifer should choose STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in STEM/BE

Q881 Why? Please select all that apply.

- ☐ Because she is likely to be able to overcome additional barriers or disadvantages she faces (1)
- ☐ Because she should not take those additional barriers or disadvantages into consideration for her decision (6)
- ☐ Because even though she may face additional barriers or disadvantages, conditions in STEM/BE may improve for her gender if more students of the same gender choose it (7)

Display This Question:

If You said that Jennifer would be likely to face additional barriers or disadvantages because of he... = Slightly more likely in non-STEM/BE

Or You said that Jennifer would be likely to face additional barriers or disadvantages because of he... = Much more likely in non-STEM/BE

Or You said that Jennifer would be likely to face additional barriers or disadvantages because of he... = Moderately more likely in non-STEM/BE

Q889 .Skin #Logo { display:none; } In light of Jennifer's concerns and your own views regarding possible barriers and disadvantages due to one's gender in different fields, what would be your overall recommendation?

○ Jennifer should avoid choosing non-STEM/BE, because she is more likely to face additional barriers or disadvantages because of her gender in non-STEM/BE (1)

○ Jennifer should choose non-STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in non-STEM/BE (6)

Display This Question:

If In light of Jennifer's concerns and your own views regarding possible barriers and disadvantages... = Jennifer should choose non-STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in non-STEM/BE

Q890 Why? Please select all that apply.

☐ Because she is likely to be able to overcome additional barriers or disadvantages she faces (1)

☐ Because she should not take those additional barriers or disadvantages into consideration for her decision (6)

☐ Because even though she may face additional barriers or disadvantages, conditions in non-STEM/BE may improve for her gender if more students of the same gender choose it (7)

Display This Question:

If Do you think there is at least one category of majors in which Jennifer, Mark, or Emma are likely... = Mark (bottom 20%) [Yes]

Q664 .Skin #Logo { display:none; } You said that Mark would be likely to face additional barriers or disadvantages because of his gender. In which major category would Mark be more likely to face additional barriers or disadvantages?

	Much more likely in non-STEM/BE (1)	Moderately more likely in non-STEM/BE (6)	Slightly more likely in non-STEM/BE (2)	Equally likely (3)	Slightly more likely in STEM/BE (4)	Moderately more likely in STEM/BE (7)	Much more likely in STEM/BE (5)
Mark (bottom 20%) (2)	○	○	○	○	○	○	○

Display This Question:

If Do you think there is at least one category of majors in which Jennifer, Mark, or Emma are likely... = Mark (bottom 20%) [Yes]

Q666 Now consider STEM/BE and non-STEM/BE majors together. How likely do you think it is that Mark could overcome these additional barriers or disadvantages by working hard and excelling?

	0 - Absolutely no chance 0 10 20 30 40 50 60 70 80 90 100 - Will absolutely happen
Mark (bottom 20%) ()	

Display This Question:

If You said that Mark would be likely to face additional barriers or disadvantages because of his ge... = Slightly more likely in STEM/BE

Or You said that Mark would be likely to face additional barriers or disadvantages because of his ge... = Much more likely in STEM/BE

Or You said that Mark would be likely to face additional barriers or disadvantages because of his ge... = Moderately more likely in STEM/BE

Q882 In light of Mark's concerns and your own views regarding possible barriers and disadvantages due to one's gender in different fields, what would be your overall recommendation?

- ○ Mark should avoid choosing STEM/BE, because he is more likely to face additional barriers or disadvantages because of his gender in STEM/BE (1)
- ○ Mark should choose STEM/BE even though he is more likely to face additional barriers or disadvantages because of his gender in STEM/BE (6)

Display This Question:

If In light of Mark's concerns and your own views regarding possible barriers and disadvantages due... = Mark should choose STEM/BE even though he is more likely to face additional barriers or disadvantages because of his gender in STEM/BE

Q883 Why? Please select all that apply.

- ☐ Because he is likely to be able to overcome additional barriers or disadvantages he faces (1)
- ☐ Because he should not take those additional barriers or disadvantages into consideration for his decision (6)
- ☐ Because even though he may face additional barriers or disadvantages, conditions in STEM/BE may improve for his gender if more students of the same gender choose it (7)

Display This Question:

If You said that Mark would be likely to face additional barriers or disadvantages because of his ge... = Slightly more likely in non-STEM/BE

Or You said that Mark would be likely to face additional barriers or disadvantages because of his ge... = Much more likely in non-STEM/BE

Or You said that Mark would be likely to face additional barriers or disadvantages because of his ge... = Moderately more likely in non-STEM/BE

Q891 In light of Mark's concerns and your own views regarding possible barriers and disadvantages due to one's gender in different fields, what would be your overall recommendation?

- ○ Mark should avoid choosing non-STEM/BE, because he is more likely to face additional barriers or disadvantages because of his gender in non-STEM/BE (1)
- ○ Mark should choose non-STEM/BE even though he is more likely to face additional barriers or disadvantages because of his gender in non-STEM/BE (6)

Display This Question:

If In light of Mark's concerns and your own views regarding possible barriers and disadvantages due... = Mark should choose non-STEM/BE even though he is more likely to face additional barriers or disadvantages because of his gender in non-STEM/BE

Q892 Why? Please select all that apply.

- ☐ Because he is likely to be able to overcome additional barriers or disadvantages he faces (1)
- ☐ Because he should not take those additional barriers or disadvantages into consideration for his decision (6)
- ☐ Because even though he may face additional barriers or disadvantages, conditions in non-STEM/BE may improve for his gender if more students of the same gender choose it (7)

Display This Question:

If Do you think there is at least one category of majors in which Jennifer, Mark, or Emma are likely... = Emma (top 20%) [Yes]

Q663 .Skin #Logo { display:none; } You said that Emma would be likely to face additional barriers or disadvantages because of her gender. In which major category would Emma be more likely to face additional barriers or disadvantages?

	Much more likely in non-STEM/BE (1)	Moderately more likely in non-STEM/BE (6)	Slightly more likely in non-STEM/BE (2)	Equally likely (3)	Slightly more likely in STEM/BE (4)	Moderately more likely in STEM/BE (7)	Much more likely in STEM/BE (5)
Emma (top 20%) (3)	○	○	○	○	○	○	○

Display This Question:

If Do you think there is at least one category of majors in which Jennifer, Mark, or Emma are likely... = Emma (top 20%) [Yes]

Q665 Now consider STEM/BE and non-STEM/BE majors together. How likely do you think it is that Emma could overcome these additional barriers or disadvantages by working hard and excelling?

	0 - Absolutely no chance 0 10 20 30 40 50 60 70 80 90 100 - Will absolutely happen
Emma (top 20%) ()	

Display This Question:

If You said that Emma would be likely to face additional barriers or disadvantages because of her ge... = Slightly more likely in STEM/BE

Or You said that Emma would be likely to face additional barriers or disadvantages because of her ge... = Much more likely in STEM/BE

Or You said that Emma would be likely to face additional barriers or disadvantages because of her ge... = Moderately more likely in STEM/BE

Q884 In light of Emma's concerns and your own views regarding possible barriers and disadvantages due to one's gender in different fields, what would be your overall recommendation?

- ○ Emma should avoid choosing STEM/BE, because she is more likely to face additional barriers or disadvantages because of her gender in STEM/BE (1)
- ○ Emma should choose STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in STEM/BE (6)

Display This Question:

If In light of Emma's concerns and your own views regarding possible barriers and disadvantages due... = Emma should choose STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in STEM/BE

Q885 Why? Please select all that apply.

- ☐ Because she is likely to be able to overcome additional barriers or disadvantages she faces (1)
- ☐ Because she should not take those additional barriers or disadvantages into consideration for her decision (6)
- ☐ Because even though she may face additional barriers or disadvantages, conditions in STEM/BE may improve for her gender if more of them choose it (7)

Display This Question:

If You said that Emma would be likely to face additional barriers or disadvantages because of her ge... = Slightly more likely in non-STEM/BE

Or You said that Emma would be likely to face additional barriers or disadvantages because of her ge... = Much more likely in non-STEM/BE

Or You said that Emma would be likely to face additional barriers or disadvantages because of her ge... = Moderately more likely in non-STEM/BE

Q893 In light of Emma's concerns and your own views regarding possible barriers and disadvantages due to one's gender in different fields, what would be your overall recommendation?

- ○ Emma should avoid choosing non-STEM/BE, because she is more likely to face additional barriers or disadvantages because of her gender in non-STEM/BE (1)
- ○ Emma should choose non-STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in non-STEM/BE (6)

Display This Question:

If In light of Emma's concerns and your own views regarding possible barriers and disadvantages due... = Emma should choose non-STEM/BE even though she is more likely to face additional barriers or disadvantages because of her gender in non-STEM/BE

Q894 Why? Please select all that apply.

- ☐ Because she is likely to be able to overcome additional barriers or disadvantages she faces (1)
- ☐ Because she should not take those additional barriers or disadvantages into consideration for her decision (6)
- ☐ Because even though she may face additional barriers or disadvantages, conditions in non-STEM/BE may improve for her gender if more of them choose it (7)

End of Block: 2F1M_1H2L

Start of Block: peer

JS

Q4.1 .Skin #Logo { display:none; } **We will now ask you questions about your own situation.**

Please answer to what extent you agree with the following statement: **It is important to have others of your gender <u>in your classes and in the workplace</u> in order to have people to relate to, develop a sense of belonging, or create a better culture**

	Strongly disagree										Strongly agree
	0	10	20	30	40	50	60	70	80	90	100
()											

End of Block: peer

Start of Block: discrimination

JS

Q6.1.2a .Skin #Logo { display:none; } Please answer to what extent you agree with the following statements.

While pursuing your degree, you will face additional barriers or disadvantages in university because of your gender

	1 - Strongly disagree (45)	(46)	(47)	4 - Neither agree nor disagree (48)	(49)	(50)	7 - Strongly agree (51)
in STEM/BE (1)	○	○	○	○	○	○	○
in non-STEM/BE (2)	○	○	○	○	○	○	○

Q6.1.1a **In the workplace, you will face barriers or disadvantages because of your gender**

	1 - Strongly disagree (22)	(23)	(24)	4 - Neither agree nor disagree (25)	(26)	(27)	7 - Strongly agree (28)
in STEM/BE (1)	○	○	○	○	○	○	○
in non-STEM/BE (2)	○	○	○	○	○	○	○

Display This Question:

If Please answer to what extent you agree with the following statements. While pursuing your degree,... != in STEM/BE [1 - Strongly disagree]

Or In the workplace, you will face barriers or disadvantages because of your gender != in STEM/BE [1 - Strongly disagree]

And If

In the workplace, you will face barriers or disadvantages because of your gender != in non-STEM/BE [1 - Strongly disagree]

Or Please answer to what extent you agree with the following statements. While pursuing your degree,... != in non-STEM/BE [1 - Strongly disagree]

Q6.1.2e **If you face additional barriers or disadvantages in school or the workplace, you will be able to overcome them if you work hard enough and excel**

	1 - Strongly disagree (1)	(2)	(3)	4 - Neither agree nor disagree (4)	(5)	(6)	7 - Strongly agree (7)
in STEM/BE (1)	○	○	○	○	○	○	○
in non-STEM/BE (2)	○	○	○	○	○	○	○

Display This Question:

If Please answer to what extent you agree with the following statements. While pursuing your degree,... != in non-STEM/BE [1 - Strongly disagree]

And Please answer to what extent you agree with the following statements. While pursuing your degree,... = in STEM/BE [1 - Strongly disagree]

And In the workplace, you will face barriers or disadvantages because of your gender = in STEM/BE [1 - Strongly disagree]

Or If

In the workplace, you will face barriers or disadvantages because of your gender != in non-STEM/BE [1 - Strongly disagree]

And In the workplace, you will face barriers or disadvantages because of your gender = in STEM/BE [1 - Strongly disagree]

And Please answer to what extent you agree with the following statements. While pursuing your degree,... = in STEM/BE [1 - Strongly disagree]

Q655 **If you face additional barriers or disadvantages in school or the workplace, you will be able to overcome them if you work hard enough and excel**

	1 - Strongly disagree (1)	(2)	(3)	4 - Neither agree nor disagree (4)	(5)	(6)	7 - Strongly agree (7)
in non-STEM/BE (2)	○	○	○	○	○	○	○

Display This Question:

If Please answer to what extent you agree with the following statements. While pursuing your degree,... != in STEM/BE [1 - Strongly disagree]

And Please answer to what extent you agree with the following statements. While pursuing your degree,... = in non-STEM/BE [1 - Strongly disagree]

And In the workplace, you will face barriers or disadvantages because of your gender = in non-STEM/BE [1 - Strongly disagree]

Or If

In the workplace, you will face barriers or disadvantages because of your gender != in STEM/BE [1 - Strongly disagree]

And In the workplace, you will face barriers or disadvantages because of your gender = in non-STEM/BE [1 - Strongly disagree]

And Please answer to what extent you agree with the following statements. While pursuing your degree,... = in non-STEM/BE [1 - Strongly disagree]

Q654 **If you face additional barriers or disadvantages in school or the workplace, you will be able to overcome them if you work hard enough and excel**

	1 - Strongly disagree (1)	(2)	(3)	4 - Neither agree nor disagree (4)	(5)	(6)	7 - Strongly agree (7)
in STEM/BE (1)	○	○	○	○	○	○	○

Q886 We would like to know how your views may have changed since enrolling at UM. How do you think you would have answered the following question just before starting university?

In the workplace, you will face barriers or disadvantages because of your gender

	1 - Strongly disagree (22)	(23)	(24)	4 - Neither agree nor disagree (25)	(26)	(27)	7 - Strongly agree (28)
in STEM/BE (1)	○	○	○	○	○	○	○
in non-STEM/BE (2)	○	○	○	○	○	○	○

Q887 Earlier, you mentioned that you have a ${Q2.1/ChoiceNumericEntryValue/1} percent chance (or chances out of 100) of graduating with a major in STEM/BE and ${Q2.2/ChoiceNumericEntryValue/1} percent chance of graduating with a major in non-STEM/BE. If you could be confident that you will not have to face additional barriers or disadvantages because of your gender in the workplace for either category of majors, would it change your previous answer?

○ Yes (1)

○ No (2)

Display This Question:

If Earlier, you mentioned that you have a ${q://QID21/ChoiceNumericEntryValue/1} percent chance (or... = Yes

Q888 The percent chance (or chances out of 100) that you would graduate with a major in each of the following category if you did not have to face additional barriers or disadvantages because of your gender is

	0 10 20 30 40 50 60 70 80 90 100
STEM/BE ()	
Non-STEM/BE ()	

Page Break

Q270 .Skin #Logo { display:none; } We will next ask you some questions as they pertain to your career after graduating.

Q6.1.1c Do you expect to be more or less likely to receive an offer for a job you apply to than a similarly-qualified graduate of the opposite gender?

	Less likely (1)	Equally likely (2)	More likely (3)
in STEM/BE (1)	○	○	○
in non-STEM/BE (2)	○	○	○

Display This Question:

If Do you expect to be more or less likely to receive an offer for a job you apply to than a similar... = in STEM/BE [More likely]

JS ✱

Q859 You said that you think you are more likely to receive an offer in STEM/BE than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would have a 10% higher chance of getting an offer, write 10.

○ in STEM/BE (1) _____

Display This Question:

If Do you expect to be more or less likely to receive an offer for a job you apply to than a similar... = in STEM/BE [Less likely]

JS ✱

Q873 You said that you think you are less likely to receive an offer in STEM/BE than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would have a 10% lower chance of getting an offer, write 10.

○ in STEM/BE (1) _____

Display This Question:

If Do you expect to be more or less likely to receive an offer for a job you apply to than a similar... = in non-STEM/BE [More likely]

JS ✱

Q861 You said that you think you are more likely to receive an offer in non-STEM/BE than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would have a 10% higher chance of getting an offer, write 10.

○ in non-STEM/BE (2) _____

Display This Question:

If Do you expect to be more or less likely to receive an offer for a job you apply to than a similar... = in non-STEM/BE [Less likely]

JS ✱

Q874 You said that you think you are less likely to receive an offer in non-STEM/BE than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would have a 10% lower chance of getting an offer, write 10.

○ in non-STEM/BE (2) _____

Q862 Do you expect to be paid more or less for doing the same work than a similarly-qualified graduate of the opposite gender?

	Less (1)	Same (2)	More (3)
in STEM/BE (1)	○	○	○
in non-STEM/BE (2)	○	○	○

Display This Question:

If Do you expect to be paid more or less for doing the same work than a similarly-qualified graduate... = in STEM/BE [More]

JS ✱

Q863 You said that you expect to be paid more in STEM/BE for doing the same work than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would be paid 10% more, write 10.

○ in STEM/BE (1) _____

Display This Question:

If Do you expect to be paid more or less for doing the same work than a similarly-qualified graduate... = in STEM/BE [Less]

JS ✱

Q875 You said that you expect to be paid less in STEM/BE for doing the same work than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would be paid 10% less, write 10.

○ in STEM/BE (1) _____

Display This Question:

If Do you expect to be paid more or less for doing the same work than a similarly-qualified graduate... = in non-STEM/BE [More]

JS ✱

Q864 You said that you expect to be paid more in non-STEM/BE for doing the same work than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would be paid 10% more, write 10.

○ in non-STEM/BE (2) _____

Display This Question:

If Do you expect to be paid more or less for doing the same work than a similarly-qualified graduate... = in non-STEM/BE [Less]

JS ✱

Q876 You said that you expect to be paid less in STEM/BE for doing the same work than a similarly-qualified graduate of the opposite gender. Please indicate the percent difference you expect. For example, if you think you would be paid 10% less, write 10.

○ in non-STEM/BE (2) _____

Page Break

Q870 .Skin #Logo { display:none; } How frequently do you expect that the following situations will arise at your workplace? Please answer on a 1-7 scale where 1 means almost never and 7 means almost always.

Your competence will be underestimated or questioned because of your gender

	1 - Almost never (1)	(2)	(3)	4 - Occasionally (4)	(5)	(6)	7 - Almost always (7)
in STEM/BE (1)	○	○	○	○	○	○	○
in non-STEM/BE (2)	○	○	○	○	○	○	○

Q871 **You will face hostility or worse treatment because of your gender**

	1 - Almost never (1)	(2)	(3)	4 - Occasionally (4)	(5)	(6)	7 - Almost always (7)
in STEM/BE (1)	○	○	○	○	○	○	○
in non-STEM/BE (2)	○	○	○	○	○	○	○

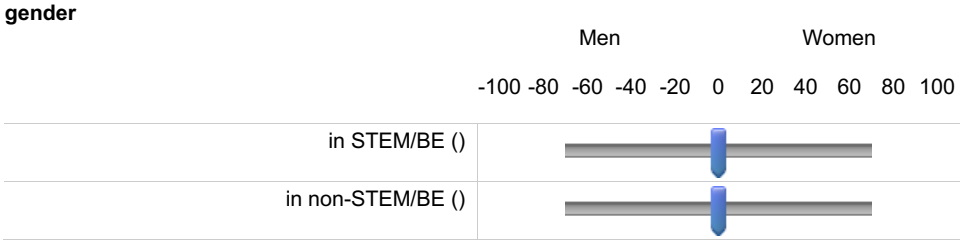
Q872 **You will face sexual harassment**

	1 - Almost never (1)	(2)	(3)	4 - Occasionally (4)	(5)	(6)	7 - Almost always (7)
in STEM/BE (1)	○	○	○	○	○	○	○
in non-STEM/BE (2)	○	○	○	○	○	○	○

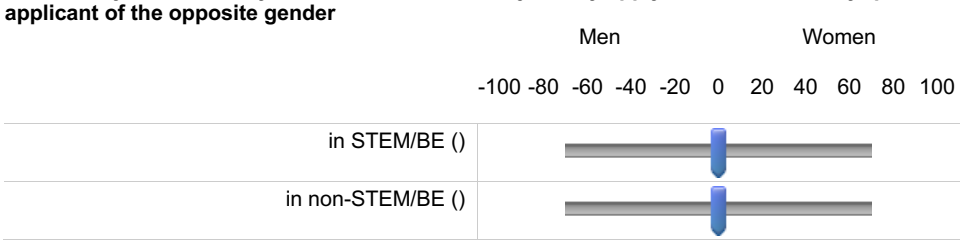
Page Break

Q6.2intro .Skin #Logo { display:none; } We will now ask you a similar set of questions, but about **female graduates compared to male graduates** in general. Please answer on a -100 to 100 scale, where 100 means that you believe the statement is much more likely to apply to women than men, 0 means that you believe the statement is equally likely to apply to women and men, and -100 means that you believe the statement is much more likely to apply to men than women.

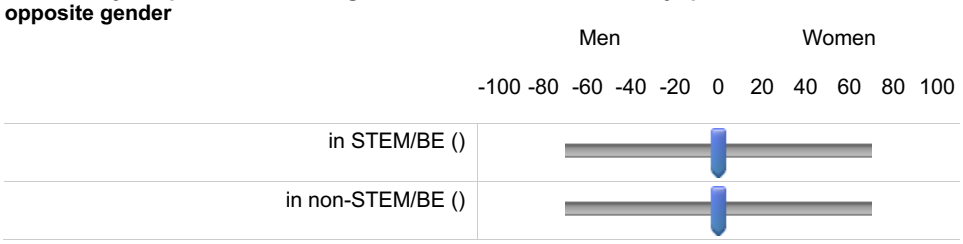
Q6.2.1 **They face additional barriers or disadvantages in the workplace because of their gender**



Q6.2.3 **They are less likely to receive an offer for a job they apply for than a similarly-qualified applicant of the opposite gender**



Q6.2.2 **They are paid less for doing the same work than a similarly-qualified worker of the opposite gender**



End of Block: discrimination

Start of Block: past

JS

Q7.1 .Skin #Logo { display:none; } Have you ever had any unpleasant and/or negative experiences in courses or activities which discouraged you from studying that major category?

	Yes (1)	No (2)
STEM/BE (1)	○	○
Non-STEM/BE (2)	○	○

Q7.2 Have you been exposed to information suggesting that studying in the major category or working in related fields would be less suitable or more difficult because of your gender?

	Yes (1)	No (2)
STEM/BE (1)	○	○
Non-STEM/BE (2)	○	○

Display This Question:

If Have you ever had any unpleasant and/or negative experiences in courses or activities which disco... : = STEM/BE [Yes]

Q7.1a .Skin #Logo { display:none; } Please describe your negative experience in STEM/BE:

_____

Display This Question:

If Have you ever had any unpleasant and/or negative experiences in courses or activities which disco... : = Non-STEM/BE [Yes]

Q7.1b .Skin #Logo { display:none; } Please describe your negative experience in non-STEM/BE:

_____

Display This Question:

If Have you been exposed to information suggesting that studying in the major category or working in... : = STEM/BE [Yes]

Q7.2a .Skin #Logo { display:none; } Please describe the negative information that you have been exposed to about STEM/BE:

_____

Display This Question:

If Have you been exposed to information suggesting that studying in the major category or working in... : = Non-STEM/BE [Yes]

Q7.2b .Skin #Logo { display:none; } Please describe the negative information that you have been exposed to about non-STEM/BE:

_____

Page Break

Qattention2 .Skin #Logo { display:none; } Please indicate how much you agree with the following statements.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I answered all questions the best I could. (3)	○	○	○	○	○
Select the option that is the furthest to the left/top (i.e., the first option). (4)	○	○	○	○	○

Page Break

Q858 .Skin #Logo { display:none; } What do you think the purpose of this survey was?

_____

Page Break

address Please provide your mailing address. Note that this question is optional (the gift card will be emailed to you regardless). We are required to ask this question for legal reasons.

_____

end Thank you for completing our survey. Press the right arrow below to submit your survey.
The study team will contact you within 6 weeks after the end of the survey with information on how to claim your prize.

End of Block: past