

'Acting Wife': Marriage Market Incentives and Labor Market Investments[†]

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Do single women avoid career-enhancing actions because these actions signal undesirable traits, like ambition, to the marriage market? While married and unmarried female MBA students perform similarly when their performance is unobserved by classmates (on exams and problem sets), unmarried women have lower participation grades. In a field experiment, single female students reported lower desired salaries and willingness to travel and work long hours on a real-stakes placement questionnaire when they expected their classmates to see their preferences. Other groups' responses were unaffected by peer observability. A second experiment indicates the effects are driven by observability by single male peers. (JEL C93, D82, J12, J16, J31)

Even in the twenty-first century, men prefer female partners who are less professionally ambitious than they are (Fisman et al. 2006). Men tend to avoid female partners with characteristics usually associated with professional ambition, such as high levels of education (Brown and Lewis 2004; Greitemeyer 2007; Hitsch, Hortaçsu, and Ariely 2010). It is relatively unlikely that a woman will earn more than her husband, and when she does, marital satisfaction is lower and divorce is more likely (Bertrand, Kamenica, and Pan 2015). Promotions increase the chance of divorce for women, but not for men (Folke and Rickne 2016).

Single women may thus face a trade-off: actions that lead to professional success might be sanctioned in the marriage market because they signal ambition and

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assertiveness.¹ For example, while volunteering for leadership roles or asking for a promotion might help women's careers, they may also send negative signals to the marriage market. This trade-off can be pervasive and is not limited to large, discrete decisions. Daily activities such as speaking up in meetings, taking charge of a project, working late, or even certain outfits, haircuts, and makeup can be desirable in one market and not in the other. Hiding career-enhancing actions from potential partners may be challenging for single women: it is likely difficult to hide working late or traveling for work, for example. Moreover, the workplace is the most common place to meet a partner (Rosenfeld, Thomas, and Falcon 2015). Similar to minority students who shy away from educational investments to avoid "acting white" and improve their standing with peers (Austen-Smith and Fryer 2005; Fryer and Torelli 2010), single women might try to improve their marriage options by "acting wife." On the other hand, for men, the consequences of actions in the labor and marriage markets are more closely aligned: women value their partner's intelligence and education, even when these exceed their own (Fisman et al. 2006; Lee 2016).

In this paper, we test for the existence and the implications of this trade-off by studying students in an elite US MBA (Master of Business Administration) program. Graduate school is a natural place to study this trade-off. Many students are both investing in their professional career and looking for a long-term partner.² For example, a 2015 survey of Harvard Business School (HBS) MBA alumni indicates that among the youngest surveyed cohort ("Generation Y," aged 25–30), 31 percent of married women and 16 percent of married men are married to an HBS alum.³ Many actions in graduate school are observable to peers—and thus may influence marriage outcomes—and are potentially important for the labor market. These include joining professional clubs and organizations, on-campus interviews, trips to career fairs, and participation in case competitions. There are substantial gender differences in career outcomes for elite MBA program graduates (Bertrand, Goldin, and Katz 2010). Male preferences for less ambitious women have been documented in similar contexts: Fisman et al. (2006) studies Columbia University graduate students (including MBA students), for example.

We start by providing observational evidence that single women avoid activities that could help their careers to avoid signaling traits that may be penalized in the marriage market. We conducted a survey asking first-year MBA students whether in the two years before business school they had avoided certain actions they thought would help their careers because they were concerned it would make them "look too ambitious, assertive, or pushy." Sixty-four percent of single females said they had avoided asking for a raise or a promotion for that reason, relative to only 39 percent

¹ While in the paper we mostly refer to the "marriage market," this trade-off may also apply to a more general "dating market" where women also seek romantic relationships not expected to lead to marriage.

² For example, a New York Times article describes how a female Harvard MBA student dealt with such trade-off: "Judging from comments from male friends about other women ('She's kind of hot, but she's so assertive'), Ms. Navab feared that seeming too ambitious could hurt what she half-jokingly called her social cap, referring to capitalization," and wondered about her goals: "Were her priorities purely professional, were they academic, were they to start dating someone?" It also describes how after she "started dating ... [she] felt freer to focus on her career once she was paired off." (Jodi Kantor, "Harvard Business School Case Study: Gender Equity," *New York Times*, September 7, 2013)

³ The rates of marriage are also high for other cohorts. In the "Generation X" cohort (aged 31–47), 23 percent of married women and 9 percent of married men are married to an HBS alum. The respective numbers for the "Baby Boomer" generation (aged 48–66), are 23 percent and 5 percent (Ely 2015).

of women who were married or in a serious relationship and 27 percent of men. Over one-half (52 percent) of single women reported avoiding speaking up in meetings, relative to 33 percent of non-single women, and 28 percent of men. Overall, almost three-quarters (73 percent) of single women said they had avoided actions they believed would help their career because they were worried about looking too ambitious.

Next, we document that unmarried female MBA students have lower class participation grades than married ones. Class participation is observable to peers and may signal students' ambition or assertiveness.⁴ It is not the case that unmarried women, in general, perform worse in class than married women: both groups perform similarly on their midterm exam, final exam, and problem sets. The difference—approximately one-third of a standard deviation—is only present for the observable part of the grade. It is not driven by observable differences (e.g., age or citizenship status) between the two groups. For men, who do not face the same trade-off, the differences in participation grades by marital status are negligible. Note that lower participation grades are consequential: they are a component of final grades, which this school discloses to potential employers.

Our main results come from two field experiments that directly test whether single women respond to the studied trade-off by explicitly changing their behavior, making themselves look less professionally appealing. In the first (primary) experiment, we randomize whether actions with positive labor market consequences (potential signals of ambition) are expected to be observed by one's classmates. Classmate observability allows the actions to have larger marriage market consequences.

On the first day of the MBA program, during a career advising session for the newly admitted class, a career counselor asked students to complete a questionnaire about their job preferences. The questionnaire asked about students' preferences over fields and geography and included a number of questions for which we expect that the answers that would make respondents more appealing job candidates would also make women less attractive spouses. It asked about students' desired compensation, hours of work, and days per month of travel. It also asked students to rate their leadership abilities and professional ambition. These questions are commonly used in recruiting MBA students and shape what positions are considered a good fit for a candidate. From the students' standpoint, this questionnaire had substantial stakes. This was the first information the career center collected on students' preferences and they were told the information would be used to place them into summer internships.⁵ The career office informed us that students' reported preferences would have impacted their placement: for example, if a student was not willing to travel at least four days per week, she would be steered away from consulting, while if she reported not wanting to work long hours, she should not be placed in investment banking.⁶

⁴A *New York Times* article about HBS reports that “after years of observation, administrators and professors agreed that one particular factor was torpedoing female class participation grades: women, especially single women, often felt they had to choose between academic and social success” (Jodi Kantor, “Harvard Business School Case Study: Gender Equity,” *New York Times*, September 7, 2013).

⁵The summer internship is a key step for job placement: 38 percent of the last graduating cohort accepted a post-graduation job at the firm of their summer internship.

⁶In practice, after learning about the large effects of our treatment for single women, the career center decided not to use the questionnaires in placement. However, when completing the questionnaires, students did not know this was an experiment or have any reason to believe the questionnaires would not be used.

There were two slightly different versions of the instructions; which version a student received was randomized. Both stated that a career counselor would see their answers. In the public version, students were also told that “your” answers will be discussed in the career class, while in the private version, students were told that “anonymized” answers would be discussed. The two versions of the questionnaire looked essentially identical—they differed only by one word (“your” versus “anonymized”)—so students did not know there were two versions of the questionnaire. When students thought their answers would only be viewed by a career counselor, single and non-single women answered similarly.⁷ However, when single women expected their classmates to see their answers, they portrayed themselves much less favorably to the labor market. They reported desired compensation \$18,000 per year lower. They said they would be willing to travel seven fewer days per month and work four fewer hours per week.⁸ They also reported significantly lower levels of professional ambition and tendency for leadership. Neither non-single women nor men, regardless of their relationship status, changed their answers when they expected their peers to observe their choices.

To assess an alternative interpretation that single women are simply more humble in public, we included a placebo question on self-reported writing ability. Writing skills are valued in the labor market, but not sanctioned in the marriage market. Thus, while we would predict that single women would report similar writing abilities in both treatments, a humility explanation would not. Consistent with our hypothesis, single women (and all other groups) rated their writing skills equally in the public and private treatments.

Perhaps surprisingly, there are very small gender differences in the private treatment. Women report lower desired compensation than men, but similar willingness to travel and work long hours, professional ambition, and leadership abilities. Gender gaps emerge once students expect their preferences to be shared with their peers. In other words, the bulk of the gender gap in responses is driven by (single women’s response to) expected observability and not by differences in private, which are perhaps more likely to reflect “true” preferences.

The primary experiment results indicate that single women, but not women in a relationship, avoid actions that could help their careers when these actions have negative marriage market consequences. A supplementary experiment shows that single women present themselves less favorably to the labor market—and more favorably to the marriage market—when they believe their choices will be seen by men as opposed to women. During a career class, students were asked to make choices over three pairs of hypothetical jobs. Students made these choices individually, but were told that if there was time at the end of class, the instructor would discuss their answers with the small groups in which they were completing other class activities. These groups change from day-to-day and, on this day, they were randomized such that some single women were in all-female groups while the remainder had all male group-mates. This was a natural activity during a session discussing job fit

⁷The questionnaire asked a more detailed question about relationship status than the one available in the grades data. We classify as non-single those who were “in a serious relationship,” “cohabiting,” “engaged,” or “married.”

⁸In the private treatment, single female students reported desired compensation of \$131,000, and were willing to travel 14 days a month and work 52 hours a week, on average.

and students did not know this was an experiment. They were told that these forms would be collected at the end of class, so they knew the career center would see them.

When placed in all-female groups, 68 percent of single women reported that they would prefer a job with a higher salary that required 55–60 hours of work per week over a job with a lower salary requiring only 45–50 hours per week. But, when placed with male peers, women were 26 percentage points less likely to make this choice. Similarly, in all-female groups, 79 percent of single women reported preferring a job with quicker promotion to partner but substantial travel over a job with slower and less certain promotion but no travel. When placed with male peers, women were 42 percentage points less likely to choose this option. Single women's answers to a placebo choice between a job with a positive social impact and a job with collegial coworkers were not affected by their group-mates' gender. We also exploit the random variation in the share of married men within the groups. Single women were less likely to choose the career-focused option when there were more single (as opposed to married) men in the group, consistent with marriage market signaling.⁹

We assess whether another difference between single and non-single women can explain why single women, but not women in relationships, downplay their ambition in public. While we cannot rule out that possibility, our results are not easily explained by such a difference. In the primary experiment, differences in single and non-single women's responsiveness to the public treatment are robust to allowing students' responsiveness to vary with covariates. Both groups report similar preferences and self-assessments in the private treatment. They also answer similarly (in public and private) when answers are unlikely to be sanctioned in the marriage market. Similarly, married and unmarried women have similar performance on exams and problem sets: differences only arise for the participation grades, and remain unchanged after controlling for covariates. Finally, the supplementary experiment shows that single women's decision to portray themselves as less ambitious in public is driven by the presence of *male* peers, and especially *single* male peers.

We discuss a simple model of dating market signaling (presented in online Appendix A) that helps interpret the experimental results. The model predicts that when their decisions are publicly observed, single women downplay their ambition and incur a labor market cost to increase their probability of attracting a desirable partner. When their decisions are not observed, they make the choice that maximizes their labor market outcomes. All other groups (non-single women and all men) make the decision that maximizes their labor market outcomes regardless of whether it is publicly observed.

Our results suggest that single women avoid actions that would help their careers because of marriage market concerns. Many schooling and initial career decisions—

⁹To keep the discussion of the results concise, we implicitly abstract from the possibility that some respondents might be interested in same-sex partners. No data on students' sexual orientation are collected. Ninety-seven percent of the US population labels itself as heterosexual (2014 National Health Interview Survey). The interpretation of our observational and primary experiment results is unchanged if one assumes that homosexual and bisexual women have similar partner preferences as heterosexual men, although whether this is true is an open question. The interpretation of the supplementary experiment is based on the assumption that single women in our sample are interested in male partners. The presence of a substantial share of women interested in same-sex partners would attenuate the results.

such as whether to take advanced math in high school, major in engineering, or become an entrepreneur—occur early in life when most women are single. These decisions can have labor market consequences that last long after these women get married. While extrapolating to other settings is beyond the scope of this paper, elite female MBA students comprise a selected group that presumably places a higher value on career success than the general female population. This suggests the effects of marriage market signaling are perhaps even larger in other contexts.

These findings point to marriage market signaling as an additional explanation for gender differences in the labor market. Marriage market signaling is related to explanations surrounding norms over gender identity and the propensity to negotiate. However, these existing explanations have difficulty explaining our results. Gender differences stemming from these explanations would have likely appeared when comparing answers by male and female students *in private* and would have likely not been restricted to single women, particularly given that single and non-single women behave similarly in private. Our results also add to the literature on how individuals' economic decisions are affected by social image concerns.¹⁰

The remainder of this paper proceeds as follows. In the next section, we present descriptive statistics on our sample and present results from the observational data: the survey about pre-MBA career choices and classroom grades. Section II lays out the design of the primary and supplementary experiments, presents the experimental results, and discusses alternative interpretations. Section III concludes.

I. Observational Evidence

A. Descriptive Statistics

We have four datasets on students in an elite MBA program. The first is administrative data on students' grades in their (required) introductory economics class for the 2010–2016 entering cohorts. The other three datasets—the survey, the primary experiment, and the supplementary experiment—were collected on the 2016 entering cohort. Except for the survey, which was anonymous, we link all of the datasets to admissions records, which has information on student characteristics.

The first column of Table 1 provides descriptive statistics on the 2,235 students who entered the program between 2010 and 2016. Almost 70 percent of students are male. They average 28 years old, with just over 5 years of work experience. Two-thirds are US citizens, with most of the remainder coming from Asia. The average GMAT score is above the ninetieth percentile of the national distribution, consistent with admission to an elite business school. The fourth column provides statistics on the primary experiment sample. Because the experiment was conducted

¹⁰See, for example, Akerlof and Kranton (2000), Fernández, Fogli, and Olivetti (2004), Niederle and Vesterlund (2007), Eckel and Grossman (2008), Fernández and Fogli (2009), Dohmen et al. (2011), Alesina, Giuliano, and Nunn (2013), Baldiga (2014), Coffman (2014), Bertrand, Kamenica, and Pan (2015), and Bordalo et al. (2016) on gender norms and identity; and Flory, Leibbrandt, and List (2014), Leibbrandt and List (2015), and Exley, Niederle, and Vesterlund (2016) on the propensity to negotiate. A large literature, surveyed by Jayachandran (2015), studies the role of social norms in explaining gender inequality in developing countries. Austen-Smith and Fryer (2005), Fryer and Torelli (2010), and Bursztyn and Jensen (2015) study social image and educational choices; DellaVigna et al. (2017) study voting; Bénabou and Tirole (2006) study prosocial behavior in general; and Charles, Hurst, and Roussanov (2009) study consumption. Bursztyn and Jensen (2017) review the topic.

TABLE 1—DESCRIPTIVE STATISTICS

	2010–2016 cohorts			2016 cohort			Survey
	Grades data			Primary experiment			
	Overall	Married women	Unmarried women	Overall	Non-single women	Single women	
Male (percent)	68.3			67.9			67.3
Age	28.0	28.9	27.1	27.9	27.5	27.3	28.1
Has children (percent)	4.7	15.9	0.2	5.7	0.0	1.7	
Years of work experience	5.1	5.8	4.6	5.2	5.0	4.9	
GMAT score	709	707	703	715	701	707	
<i>Marital/relationship status (self-reported, percent)</i>							
Single				46.2	0.0	100.0	53.3
In a serious relationship				22.0	51.9	0.0	18.0
Cohabiting				3.7	9.6	0.0	2.9
Engaged				5.9	15.4	0.0	4.8
Married				20.0	23.1	0.0	19.9
No response				2.3	0.0	0.0	1.1
<i>Marital/relationship status (admissions data, percent)</i>							
Single	77.0	0.0	100.0				
Married or in a domestic partnership	18.1	100.0	0.0				
No response	4.9	0.0	0.0				
<i>Citizenship (percent)</i>							
United States	66.0	51.2	68.2	62.5	71.2	58.3	
North America (without US)	4.1	7.3	2.4	3.9	5.8	3.3	
Asia	21.7	34.1	23.7	24.5	19.2	35.0	
Europe	3.8	2.4	2.9	2.0	1.9	1.7	
South America	3.7	4.9	1.9	6.2	1.9	1.7	
Africa	0.5	0.0	0.5	0.8	0.0	0.0	
Oceania	0.2	0.0	0.3	0.0	0.0	0.0	
Observations	2,235	82	582	355	52	60	272

Notes: The table shows descriptive statistics from the grades, primary experiment, and survey samples. The grades and primary experiment data are linked to admissions records. The survey was anonymous and cannot be linked to admissions records. Non-single refers to individuals who report being in a serious relationship, cohabiting, engaged, or married.

on the first day of the program at the career center introductory session, 98 percent of the class participated. The 2016 cohort looks similar to the earlier cohorts.

Admissions records for the 2010 to 2016 cohorts contain information on whether students were married or in a domestic partnership at the time they applied to the program: only 18 percent of students were. For the 2016 cohort, we collected more detailed information on students' relationship status during the primary experiment. While only 20 percent of students are married, less than one-half (46 percent) call themselves single. Twenty-two percent of students are in a serious relationship at the start of the MBA program, while just under 10 percent are cohabiting or engaged. These fractions are similar in the survey data (column 7). The survey was voluntary and conducted during the economics class during the middle of the semester and 76 percent of the class participated.¹¹ In the grades analysis, we can only compare

¹¹ We do not know whether nonparticipation is due to class absence or active nonresponse. Based on usual absence rates, we estimate a 90 percent response rate among present students. Attendance is not required or measured in this course.

married and unmarried students, while in the experimental and survey data, we compare single students and students in serious relationships, including engagements, cohabitations, and marriages. To distinguish this from the comparison of married and unmarried students, we refer to these students as “single” and “non-single.”

The second and third columns of Table 1 show descriptive statistics separately for married and unmarried women. Married women are about two years older on average than unmarried women and have more work experience. They are less likely to be US citizens and are more likely to be from Asia or South America. However, their GMAT scores are similar to those of unmarried women. Married men are also older (2.5 years on average), less likely to be US citizens, and more likely to be from Asia or South America than unmarried men (online Appendix Table 1). Married and unmarried men also have similar GMAT scores.

Table 1 shows that single and non-single women look much more similar than married and unmarried women. Non-single women are neither significantly older nor do they have significantly more work experience. Single women are less likely to be US citizens, although the difference is not statistically significant (online Appendix Table 1 shows the significance of these differences.) Again, there is little difference in the GMAT scores between single and non-single women. In the supplementary experiment, we only analyze data from women who reported being single in the primary experiment. We discuss the descriptive statistics of this sample in Section IID.

B. Survey on Past Behaviors

In October 2016, the first-year MBA cohort was asked to answer a short anonymous survey on its prior work experience.¹² The survey, presented in online Appendix Figure 1, was conducted during a required class (economics). It was intended as motivational evidence to assess (i) how often single women avoid actions beneficial to their careers to avoid appearing too ambitious or assertive and (ii) whether single women avoid these actions more than other groups, in particular non-single women. Specifically, it asked:

In the last two years, are there behaviors or activities at your work that could have helped you professionally that you didn't undertake because you might have looked too ambitious, assertive, or pushy?

We asked students who responded affirmatively to mark any of four behaviors they did not undertake for that reason: (i) speaking up at meetings, (ii) offering to make a presentation or sales pitch, (iii) asking for a leadership role in a team or task force, and (iv) taking initiative in negotiating a raise or asking for a promotion. We also left space for students to write in other activities that they avoided, but no one did. Almost all (98 percent) of the students reporting avoiding some activity marked one of the four listed. We also asked students' age, gender, and relationship status.

While this survey was not intended to provide causal evidence that single women adjust their behavior because of marriage market concerns, the results displayed in Table 2 are striking. Relative to the other groups and across all options provided,

¹²Admissions data show that 96 percent of students in the 2016 cohort had at least two years of prior work experience.

TABLE 2—AVOIDANCE OF WORKPLACE BEHAVIORS BY GENDER AND RELATIONSHIP STATUS (*Survey Data*)

	Taking initiative in negotiating a wage raise or promotion	Asking for a leadership role in a team or task force	Offering to make a presentation or sales pitch	Speaking up at meetings	Any behavior	Observations
Single women	63.5	40.4	25.0	51.9	73.1	52
Non-single women	39.4	24.2	15.2	33.3	60.6	33
Single men	25.3	23.0	18.4	27.6	43.7	87
Non-single men	30.3	23.6	6.7	29.2	50.6	89
<i>p-values of differences</i>						
Single versus non-single women	0.030	0.129	0.284	0.095	0.234	85
Single women versus others	0.000	0.014	0.031	0.002	0.002	261

Notes: Data are from a survey administered to first-year MBA students in the fall of 2016. Each number in the first four rows of data is the percentage of the group indicated by the row that avoided the action indicated by the column in their previous two years of work, despite the fact that they believed it could help their careers because they were concerned about appearing too ambitious, assertive, or pushy. Non-single refers to respondents in a serious relationship, cohabiting, engaged, or married.

single women were more likely to report having avoided these workplace behaviors, by amounts that are both economically and statistically significant. For example, 64 percent of single women did not take initiative in asking for a raise or a promotion because they were worried about looking too ambitious, relative to 39 percent of non-single women (the p -value of the difference is 0.030), 30 percent of non-single men, and 25 percent of single men (the p -value of the difference between single women and all other groups is below 0.001). Fifty-two percent of single women avoided speaking up at meetings for the same reason, relative to 33 percent of non-single women (the p -value of the difference is 0.095), 29 percent of non-single men, and 28 percent of single men (the p -value of the difference between single women and all other groups is 0.002). Moreover, 40 percent of single women avoided asking for a leadership role, and one-quarter refrained from offering to make a presentation or a sales pitch, despite the fact that they thought these activities could help them in their careers. Almost three-quarters of single women (73 percent) reported avoiding activities that they thought would help them professionally because they were concerned about how the activities would make them look. Adding up the number of these actions that each group avoided in the past generates a similar picture: the average number of avoided actions was 1.81 for single women, 1.12 for non-single women (p -value of the difference is 0.013), 0.94 for single men, and 0.90 for non-single men (the p -value of the difference between single women and all other groups is below 0.001). Overall, women's relationship status is predictive of avoiding these behaviors. Across all four actions, non-single women look more similar to men than to single women; the largest differences are between single and non-single women.¹³

¹³ As described in the registration of the survey (AEARCTR-0001686), the differences we observe between single and non-single women may actually underestimate the behavior differences between these two groups. Many of the currently single women may have been in relationships within the two-year window, and vice versa. Moreover, non-single women may be in relationships specifically because they avoided these seemingly ambitious behaviors.

C. Results from Students' Grades

As additional observational evidence, we compare students' participation and nonparticipation (midterm, final, and problem set) grades in their required first-year economics course. Students' participation is visible to their classmates and can affect the marriage market, whereas their performance in the rest of the class can be kept private. Thus, we expect that unmarried women should perform relatively worse on class participation than married women.

All economics sections are graded in the same way: grades from the midterm exam, the final exam, problem sets, and class participation combine to produce the overall class grade. Unlike some other top business schools, this one reports grades to potential employers, so grades can have direct labor market consequences. Panel A of Figure 1 compares married and unmarried women's participation and nonparticipation grades. Married and unmarried women perform virtually the same on exams and problem sets. Unmarried women receive a 79.2, compared to 79.8 for married women (p -value of difference: 0.496). Married and unmarried women also perform similarly on each of the individual components of this grade (online Appendix Figure 2A).

However, unmarried women perform over 6 points, or one-third of a standard deviation, lower on class participation (71.4 versus 77.5, p -value = 0.005).¹⁴ In contrast, as displayed in panel B of Figure 1, married and unmarried men perform similarly on exams and problem sets (82.0 for unmarried men versus 82.9 for married men, p -value = 0.071). (Online Appendix Figure 2B shows the components of this grade.) There is also little difference in their participation grades (75.9 versus 75.0, p -value = 0.454).¹⁵

Online Appendix Figure 3 shows the cumulative distribution functions (CDF) of married and unmarried women's participation (panel A) and nonparticipation (panel B) grades. Consistent with Figure 1, the distributions of nonparticipation grades for married and unmarried women look very similar. However, unmarried women perform worse throughout the distribution of participation grades. Online Appendix Figure 4 shows that the distributions of participation and nonparticipation grades for married and unmarried men are almost identical. Online Appendix Figure 5A compares the average participation grades of married and unmarried women by decile of nonparticipation grades (online Appendix Figure 5B presents a similar plot for men). Unmarried women perform worse on participation than married women throughout the grade distribution. It is not the case, for example, that the top married and unmarried women participate equally or that, below a certain threshold, there is no longer a difference in participation grades by marital status. Interestingly, participation grades are uncorrelated with grades on exams and problem sets and for only one of the four gender-by-marital-status groups (married women) is the correlation even

¹⁴The p -values reported in this section are based on robust standard errors (regression coefficients are presented in Table 3). Clustering at the classroom level leads to similar conclusions: the p -value of the difference in participation grades between single and married women is 0.003. Given the relatively small number of clusters (32), we also calculated a p -value equal to 0.006 using the wild cluster bootstrap- t procedure proposed by Cameron, Gelbach, and Miller (2008).

¹⁵We can reject that the difference in participation grades by marital status for women is equal to the difference in their exam and problem set grades (p -value: 0.018) and that it is equal to the difference in men's participation grades by marital status (p -value: 0.005).

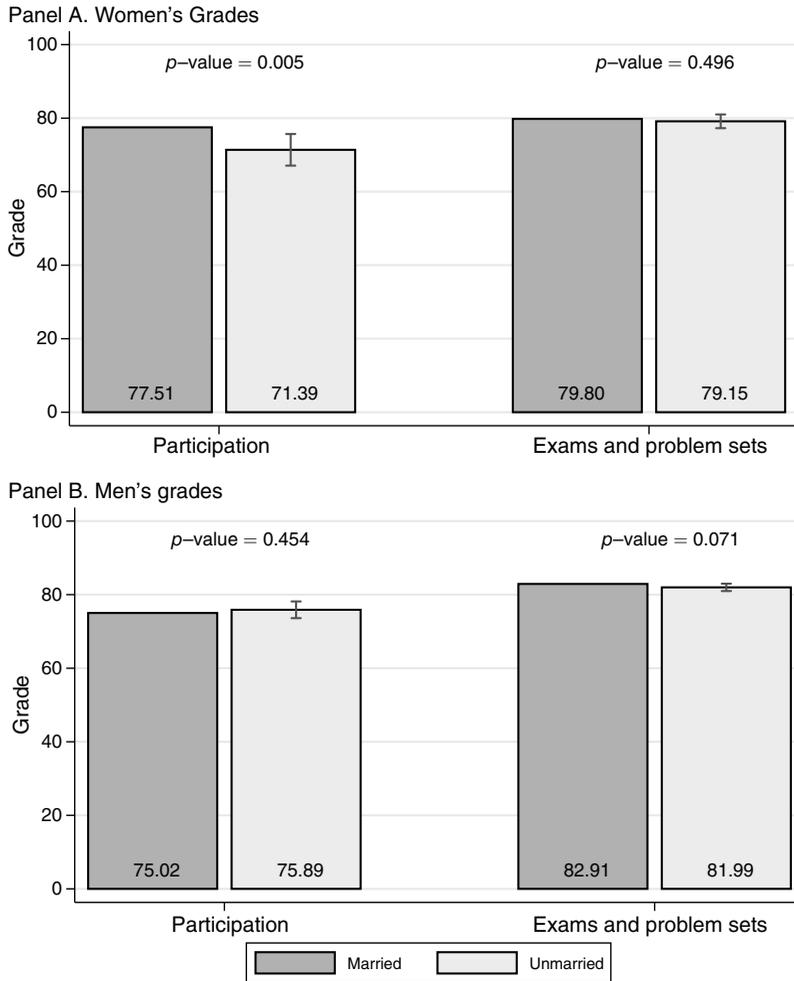


FIGURE 1

Notes: Participation is the participation grade assigned by the instructor. Exams and Problem Sets is a weighted average of grades on the midterm exam, the final exam, and problem sets, where the weights are the ones used by instructors in calculating the final grade. Both measures are out of 100. Whiskers show the 95 percent confidence interval calculated from a regression of the outcome on an indicator for being unmarried using robust standard errors.

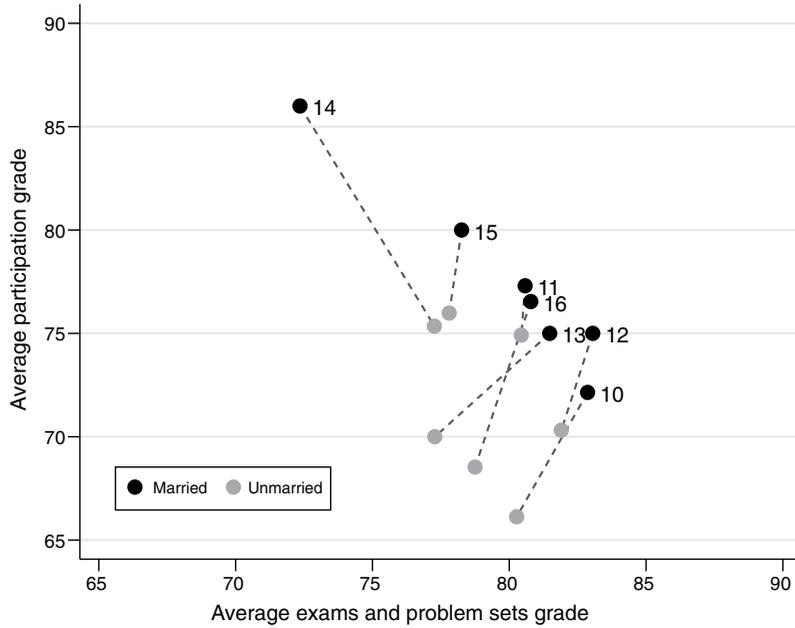
(continued)

(insignificantly) positive. Panel C of Figure 1 shows that unmarried women have lower class participation grades than married women for each of the seven cohorts in our data, whereas there is no clear pattern for married and unmarried men (panel D).

While married and unmarried women do have different observable characteristics, these characteristics do not drive the difference in their participation grades. Table 3 shows that the difference in participation grades is almost identical and there is still no difference in the nonobservable parts of the grade when controlling for other covariates observed at admission: age, GMAT score, number of years of work experience, US citizenship, and section (class) fixed effects.¹⁶ The difference

¹⁶ Unmarried women tend to be younger than married women and younger women have (insignificantly) lower participation grades. Yet unmarried women are more likely to be US citizens, who have higher participation grades.

Panel C. Women's grades by cohort



Panel D. Men's grades by cohort

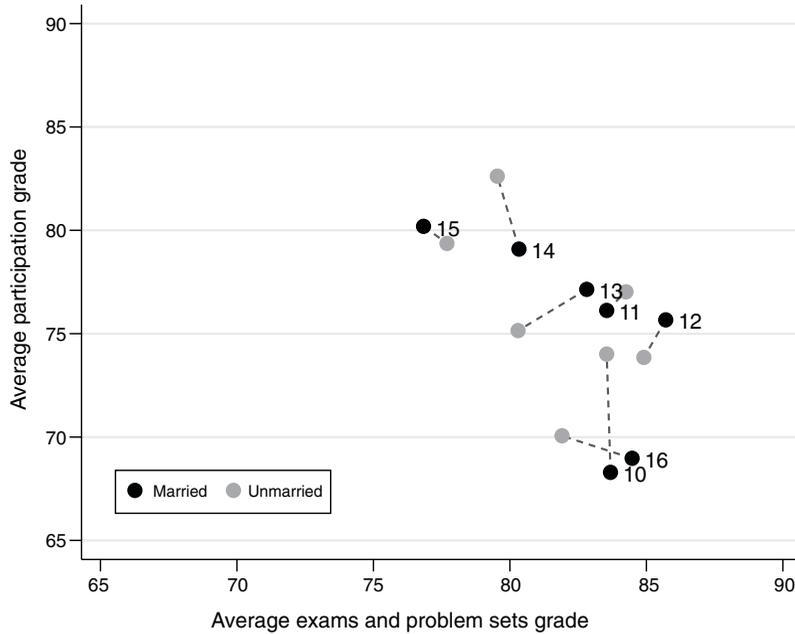


FIGURE 1 (continued)

Notes: Each dot plots the average non-participation grade (x-axis) and participation grade (y-axis) for either the married or unmarried men in a cohort. Dashed lines connect the points for married and unmarried men in the same cohort. Cohort years reflect the year the cohort entered the MBA program (e.g., “15” indicates the cohort entered the program in 2015).

TABLE 3—RELATIONSHIP STATUS AND CLASS PARTICIPATION (*Grades Data*)

	Participation	Exams and problem sets	Midterm exam	Final exam	Problem sets
<i>Panel A. Women, no controls</i>					
Unmarried	-6.12 (2.19)	-0.65 (0.95)	0.26 (1.25)	-1.85 (1.63)	0.36 (0.28)
Dependent variable mean: Married women	77.51	79.80	82.41	68.22	95.70
Observations	664	664	664	664	664
R ²	0.01	0.00	0.00	0.00	0.00
<i>Panel B. Women, with controls</i>					
Unmarried	-5.81 (2.08)	-0.78 (0.94)	-1.28 (1.35)	-0.99 (1.55)	0.04 (0.23)
Dependent variable mean: Married women	77.13	80.10	82.86	68.57	95.79
Observations	644	644	644	644	644
R ²	0.28	0.25	0.17	0.31	0.53
<i>Panel C. Men, no controls</i>					
Unmarried	0.87 (1.16)	-0.92 (0.51)	-0.33 (0.74)	-1.89 (0.83)	0.05 (0.15)
Dependent variable mean: Married men	75.02	82.91	86.03	72.81	95.94
Observations	1,461	1,461	1,461	1,461	1,461
R ²	0.00	0.00	0.00	0.00	0.00
<i>Panel D. Men, with controls</i>					
Unmarried	-0.08 (1.15)	-1.64 (0.51)	-1.26 (0.76)	-2.94 (0.83)	0.05 (0.11)
Dependent variable mean: Married men	74.79	83.08	86.25	73.06	95.94
Observations	1,442	1,442	1,442	1,442	1,442
R ²	0.21	0.26	0.19	0.27	0.54

Notes: Each column in each panel shows the results of regressing the grade indicated by the column (out of 100) on a dummy for being not married or in a domestic partnership. Regressions in panels A and B are limited to women, while regressions in panels C and D are limited to men. Regressions in panels B and D include controls for age, GMAT score, years of work experience, US citizenship, and section fixed effects. Robust standard errors are in parentheses.

in participation grades by marital status is present throughout the GMAT score distribution and for both US and non-US citizens. It is stronger for younger women in the sample, but this may be in part because younger women are more likely to be truly single (not in long-term relationships), even among the unmarried set. Because some unmarried students are actually in relationships, the true difference in participation grades between single and non-single women may be larger than what we observe.

While professors have discretion over participation grades and these grades are by their nature subjective, it is unlikely that our results are driven by professors discriminating against unmarried women. Unconscious bias could lead professors to give women lower participation grades than men for the same comments. However, it seems less likely that professors would discriminate against unmarried women relative to married women. Married women have participation grades that are higher than their male counterparts. In personal correspondence, professors reported not knowing their students' relationship status. Additionally, the point estimates are very similar when we restrict the sample to individual professors, indicating the behavior

of a subset of instructors cannot drive the results. The difference in female participation grades by marital status is equally present under male and female professors.

II. Experimental Evidence

A. Primary Experiment Design

The primary experiment took place on the first day of the MBA program during a 45-minute session the career center hosted for the entire incoming class to discuss its role in student placement. The session is part of a for-credit course with mandatory attendance. The instructor asked students to fill out an introductory questionnaire that would be used to help with summer internship placement. Summer internships are a key stepping stone to landing a permanent position. Roughly 50 percent of students in the program's last graduating cohort received a post-graduation job offer from their internship company, and over two-thirds of these students accepted it. Because summer internships are so important for ultimate placement, MBA programs spend substantial time and resources preparing students for internship interviews.

Two versions of the introductory questionnaire were distributed: a public and a private version which were identical aside from one word in the instructions. Both versions said that students' career advisor would see their answers and that employers would not. However, the public version told students that "your" answers will be discussed in the career class, while the private version told students that "anonymized" answers will be discussed. Specifically, the instructions read:

The information on this survey will help the career office get to know you and help it find the right fit for your first-year internship. This information will not be shared with employers, so please express your true preferences, not just what you think employers want to hear. This information will be shared with your career advisor and [your/anonymized] answers will be discussed during the [name of the career class].

In practice, only deidentified survey answers were discussed in class, which is consistent with both set of instructions. This is a subtle treatment: to the extent that some students did not read the instructions carefully or some students in the public treatment assumed that they could opt out of discussing their responses, our results provide a lower bound estimates of the true impact of making responses public.

An equal number of public and private questionnaires were randomly sorted into a pile that was passed out in class.¹⁷ Students received their questionnaire with a cover page, so when they were passing the questionnaires, they would neither have seen their classmates' answers (consistent with answer privacy in the private treatment), nor would they have noticed the slight difference in instruction wording between the versions. To our knowledge, no one noticed the difference in the questionnaires.

¹⁷The randomization was stratified as follows. Let n index the questionnaire's place in the pile. For any odd n , questionnaire n and $n + 1$ were never of the same version. Questionnaire n had equal likelihood of being the public or private version.

The questionnaire, which is presented in online Appendix Figure 6, was developed to ask information that is important when helping students find internships. The questionnaire first asks for demographic information—students' age, gender, and relationship and parental status. It then asks for students' preferences over industries and geography. Most students listed two to three industries. The most popular industries were technology (mentioned by 59 percent of women and 50 percent of men) and consulting (mentioned by 37 percent of women and 41 percent of men). Nine percent of students indicated they were willing to move anywhere in the world, while an additional 14 percent were flexible within the United States. An additional 40 percent of students specifically indicated interest in staying in the metropolitan area of the university (in addition to possibly other areas). Whether students were in the public or private treatment did not affect their stated preferences over industries or geography.

For our purposes, the heart of the questionnaire is a series of questions designed to present a trade-off for single women: responses which would improve women's careers would have potentially negative marriage market consequences. The questionnaire asks how often students are willing to travel for work, the number of hours per week they are willing to work, and their desired compensation.¹⁸ They were also asked to rate their professional ambition relative to their most recent work colleagues and their tendency to lead in day-to-day interactions on a 1-to-5 scale.

Positive answers to all these questions can all be seen as signals of professional ambition. Fisman et al. (2006) show that male Columbia graduate students (including MBAs) find ambition in female partners undesirable when it exceeds their own. Willingness to travel and work long hours signal less availability for home production. Bertrand, Goldin, and Katz (2010) find that differences in work hours partly explains the gender gap in earnings among Booth MBA graduates. Research in psychology also indicates that an inclination for leadership is viewed more negatively in women than men (e.g., Eagly and Karau 2002, Rudman et al. 2012).

Finally, we asked students to rate their agreement (on a 1-to-5 scale) with the statement that they have above-average writing skills. This was intended as a placebo to differentiate our theory—in which single women avoid traits sanctioned in the marriage market—from one in which single women want to appear more humble and rate themselves worse on any positive attribute when they think others will see their answers. Focus group testing on Mechanical Turk supported our hypothesis that men typically view communication skills as having a positive or no impact on a relationship. Students were also asked to rate their comfort in competitive environments. While we had intended this to capture students' competitiveness, our results and focus grouping suggest that men did not view this as a negative signal in the marriage market. The focus group suggested that many men did not read this to imply that women were themselves competitive, but instead that they were comfortable in a variety of settings.¹⁹ We deliberately chose not to ask respondents to rate their own competitiveness since, unlike ambition and leadership,

¹⁸Desired compensation was asked for students' first year after graduation, including base pay, performance pay, and equity, but excluding the signing bonus.

¹⁹The focus group consisted of 50 men and 50 women under 35 years of age. It only asked (open-ended) questions related to the four self-rating questions in the experiment. A number of men reported that high professional ambition or a tendency to lead would negatively affect their opinion of and interest in dating a woman. A

competitiveness is not necessarily viewed positively by employers (per our discussions with human resources and career services personnel).

Because students were told that the questionnaire would be used in first-year internship placement, it had relatively high stakes for them. This was the first information the career center had on students' work preferences (outside of general fields of interest reported on the application). Students' preferences heavily affect what jobs the career center views as good fits for them. For example, the director of the career center told us that if students reported desiring less travel, they would be steered away from consulting (which commonly requires traveling four or more days per week), and if students reported not wanting to work long hours, they should not be placed in investment banking. However, after the questionnaire was administered, the career center decided not to use the questionnaire in placement since the large effects of the public treatment would have harmed single women.²⁰ Students did not know the questionnaire was part of a research project, making the possibility of experimenter demand effects unlikely. Three months after the experiment took place, we presented the results to interested students and no one mentioned that they suspected these questionnaires or the questionnaire in the supplementary experiment could have been part of a research project.

B. Supplementary Experiment Design

Three months after the primary experiment, we ran a supplementary experiment designed to identify whether single women would disproportionately represent themselves as less ambitious and career-focused in front of their *male* classmates.

During the career class's last meeting of the semester (on job fit), students were given a questionnaire with three pairs of hypothetical jobs and asked to choose their preferred job in each pair. The questionnaire is presented in online Appendix Figure 7. Each job was described by one sentence and the pairs were designed to present a clear trade-off. Students chose between a job with a high salary requiring 55–60 hours per week and a job with a lower salary requiring 45–50 hours per week. They also chose between a job with constant travel, but with the opportunity of rapid promotion to partner and a job with no travel, but in which promotion was slower and less certain. To disguise the intent of the exercise and to act as a placebo students were asked to choose between a job with a positive social impact but little interaction with coworkers and a job with a collegial and collaborative work environment, but no social impact.

The two questions of interest were designed to capture—as in the primary experiment—the trade-off between labor market success (higher salary, quick promotion to partner) and desirability in the marriage market (shorter hours, no travel). We presented a choice between two jobs so this would not seem too similar to the primary experiment questionnaire. These are relevant choices that students need to consider and it seems natural for them to do so in a class on job fit.

number of women reported that revealing high ambition or a tendency to lead would make them less attractive to potential dating partners.

²⁰The career center was not surprised by the direction of our measured effects. It was interested in running this experiment because it believed that single women were less willing to take jobs with substantial travel or long hours due to marriage market concerns. However, the center was surprised by the magnitude of the effects.

Students were placed into small groups of six or seven for other class activities, a common practice in the course. They were asked to complete the questionnaire before they started the day's group work and were told to move onto the rest of the group work when finished. Specifically, the instructions read:

Please fill out the following questionnaire. There are no right or wrong answers. Once you have finished the questionnaire, continue onto the rest of the group work. If there is time at the end of class, the instructor will circulate and discuss your answers with your small group. The forms will be collected at the end of class.

Thus, students thought their answers would be seen by the career counselor and potentially by the rest of their small group. While students likely believed that this questionnaire did not have as high stakes as the primary experiment questionnaire, they still had reason to believe the career center was interested in their answers and thus, their answers could affect their placement.²¹

The key manipulation was that we randomized the gender composition of the small groups. Approximately one-half of single women were placed into all-female groups and the remainder were placed with all male group-mates. Thus, some single women thought that their answers could be shared with other women, while the remainder thought their answers could be shared with men.

Due to limited power and the finding from the primary experiment that only single women's answers are affected by peer observability, we focus on the effect of peer gender on single women's responses. To form enough all-female groups so that one-half of single women could be in them and to maximize the number of separate all-female groups single women were in, all non-single women were placed into all-female groups. Some men were in groups with one single woman, while the remainder formed all-male groups. Since there is no variation in gender group composition for non-single women and very little for men (all are in predominantly male groups), we only report the effect of group gender composition on single women. The other three groups' average choices are presented in an online Appendix figure. Men were allocated to their groups at random, without reference to their relationship status.²² While the groups were randomized within section, students' allocation to sections was determined in part by their schedule and field of interest.²³ Thus, we control for section fixed effects throughout.

C. Primary Experiment Results

Because the primary experiment was conducted on the first day of the program, virtually the whole class (98 percent) participated. Throughout the analysis, we compare single students to non-single students: those who are in a serious relationship, cohabiting, engaged, or married. This provides more precision than categorizing students by their marital status alone since students in serious relationships are

²¹ Students' responses were not actually used in placement, given the large effects of group-mates' gender.

²² These decisions were preregistered in AEARCTR-0001774.

²³ These factors do not affect students' allocation to the economics sections analyzed in Section IIC.

less likely to be affected by marriage market concerns.²⁴ Online Appendix Table 2 shows that the randomization produced balanced samples within each of the four gender-by-relationship-status subgroups, while online Appendix Table 3 shows that the randomization was balanced within the sample as a whole. We find no significant differences between the public and private treatment samples in any of the four subgroups or the entire sample. Table 1 (and online Appendix Table 1) also shows that single and non-single women look relatively similar on observable characteristics: they are of similar ages with similar work experience and have similar GMAT scores. The only difference is that single women are (insignificantly) less likely to be US citizens (more likely to be from Asia).

Before discussing each outcome individually, we provide an overall test of our main hypothesis. Following Kling, Liebman, and Katz (2007), we construct an index pooling all six of our outcomes, directly addressing the issue of multiple hypothesis testing. The index is $(1/6) \sum_{k=1}^6 (k - \mu_k) / \sigma_k$, where k indexes an outcome, and μ_k and σ_k are the mean and standard deviation of that outcome for non-single female students in the private treatment. Results are similar using the mean and standard deviations of other groups. The index conservatively includes the comfort-with-competitive-environment question for which, as previously discussed, our predictions are not as clear. It does not include the writing skills question as that was designed as a placebo.

The first column of Table 4 provides the results of regressing the index on an indicator for being in the public treatment, separately for each of the four gender-by-relationship-status subgroups. Non-single women and single and non-single men do not change their answers when they expect their answers to be shared with classmates. The effect for these groups is not only insignificant but also relatively small. Yet single women do change their answers. Single women decrease their responses by an average of 0.56 standard deviations due to peer observability. This effect is significant at the 1 percent level. We can formally reject that the effect for single women is the same as for non-single women (p -value: 0.032) and all other students (p -value below 0.001).

A natural question about Table 4 is whether our statistical inferences are sound, given the relatively small number of observations in each experimental condition. As an alternative to standard t -tests to determine statistical significance, throughout the discussion of our experimental findings, we also report results from (Fisher-exact) permutation tests. The permutation test for the effect for single women leads to a p -value of 0.0002: out of the 10,000 random reassignments of treatment status we performed, only two generated effects of absolute size equal or greater to the one observed in the data.²⁵

The four subgroups have similar mean values of this index in the private treatment. Single women have average private responses that are only 0.06 standard deviations lower than non-single women (p -value: 0.677). In other words, single

²⁴ Separating out students who are in serious relationships from those who are married shows that neither group systematically changes their answers when they believe their answers will be public. However, we cannot rule out small changes by unmarried women in relationships.

²⁵ All reported permutation p -values use 10,000 repetitions and are two-sided. Permutation p -values for the effect on the other three groups (non-single women, single men, and non-single men) are not significant (all above 0.29).

TABLE 4—EFFECT OF THE PUBLIC TREATMENT ON REPORTED JOB PREFERENCES AND SKILLS
(Primary Experiment)

	Kling- Liebman- Katz index	Desired compensation	Days per month of travel	Desired weekly hours of work	Tendency to lead	Professional ambition	Comfort in competitive environments	Writing skills
<i>Panel A. Single women</i>								
Public treatment	-0.56 (0.13)	-18.12 (8.17)	-6.93 (2.35)	-3.89 (2.11)	-0.39 (0.19)	-0.75 (0.18)	0.12 (0.21)	0.13 (0.23)
Private treatment mean	-0.06	131.05	13.55	52.21	3.87	4.13	3.29	3.84
Observations	59	60	60	59	60	60	60	60
R ²	0.23	0.08	0.13	0.05	0.07	0.23	0.01	0.01
<i>Panel B. Non-single women</i>								
Public treatment	-0.15 (0.14)	-1.22 (7.77)	0.65 (3.14)	-4.06 (1.87)	-0.05 (0.18)	-0.14 (0.19)	-0.09 (0.24)	-0.07 (0.17)
Private treatment mean	0.00	134.72	9.67	52.54	3.89	4.26	3.63	4.11
Observations	51	52	52	52	52	52	51	52
R ²	0.02	0.00	0.00	0.08	0.00	0.01	0.00	0.00
<i>Panel C. Single men</i>								
Public treatment	0.04 (0.12)	-0.89 (7.57)	2.72 (2.36)	0.39 (2.09)	0.15 (0.15)	-0.07 (0.17)	-0.11 (0.15)	0.03 (0.18)
Private treatment mean	0.15	146.88	15.38	52.25	3.69	4.23	4.02	3.90
Observations	103	104	103	104	104	104	104	104
R ²	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00
<i>Panel D. Non-single men</i>								
Public treatment	0.09 (0.10)	-7.13 (6.08)	2.39 (1.94)	3.34 (1.78)	0.11 (0.13)	-0.02 (0.12)	0.00 (0.14)	-0.12 (0.17)
Private treatment mean	-0.05	140.86	9.94	51.14	3.75	4.15	3.67	3.82
Observations	130	130	131	131	131	131	131	131
R ²	0.01	0.01	0.01	0.03	0.01	0.00	0.00	0.00
<i>Panel E. p-values: difference in the effect of the public treatment</i>								
Single versus non-single women	0.032	0.129	0.050	0.952	0.191	0.018	0.494	0.490
Single women versus others	0.000	0.101	0.000	0.042	0.018	0.000	0.471	0.475

Notes: Each cell in panels A through D presents the results of regressing the outcome indicated by the column on a dummy for being in the public treatment. Regressions are limited to the sample indicated by the panel. No controls are included. The Kling-Liebman-Katz index is defined in the text. The desired compensation and hours of work variables correspond to the midpoint of the range the respondent chose. Desired compensation is in thousands of dollars. The travel variable is the number of days per month the respondent would be willing to travel; it is also coded as the midpoint of the chosen range. The remaining outcomes are on a 1-to-5 scale. Robust standard errors are in parentheses. Panel E provides for each outcome the *p*-values for the tests that the effect of the public treatment is the same for (i) single and non-single women and (ii) single women and all other students.

and non-single women respond differently when they believe their answers will be public, but they behave similarly in private. This suggests that single and non-single women have similar career goals and would like to send similar signals to their career advisor, but that single women face a more significant trade-off between signaling their career advisor and their classmates. Online Appendix Table 4 shows these results do not change when we include controls for student characteristics.

The effects of the public treatment on responses to each individual question are presented in Figures 2–8. Table 4 and online Appendix Table 4 show regression results are similar without and with controls, while online Appendix Figures 8–14 show CDFs of responses.

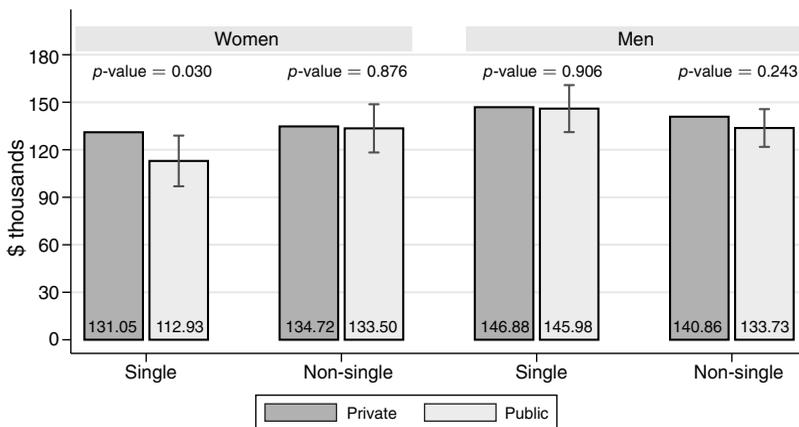


FIGURE 2. DESIRED COMPENSATION (Primary Experiment)

Notes: Students were asked their desired compensation in their first year after graduation, including base pay, performance pay, and equity, but excluding signing bonus. Desired compensation is coded as the midpoint of the chosen range, except for “under \$75,000” (coded as \$62,500) and “above \$250,000” (coded as \$262,500). Some respondents chose two or more consecutive answers. Their responses are coded as the midpoint of the full range chosen. Whiskers show the 95 percent confidence interval calculated from regressions of desired compensation on an indicator for being in the public treatment using robust standard errors. Non-single respondents are in a serious relationship, cohabiting, engaged, or married.

In the private treatment, single women and women in a relationship report similar desired compensation (\$131,000 and \$135,000, respectively, Figure 2).²⁶ Students aiming for higher-paying industries report desiring higher salaries. Even in the private treatment, men report higher desired compensation than do women (\$147,000 and \$141,000 for single men and men in a relationship, respectively). This is not driven by industry preferences; men report higher desired compensation that women conditional on the industries they report wanting to work in.

Single women dramatically decrease their reported desired compensation—by \$18,000 per year or 14 percent—when they think their classmates will see their responses. This difference is significant using both robust standard errors (*p*-value: 0.030) and a permutation test (*p*-value: 0.029). As in the grade analysis, the effect shows up throughout the distribution. While 16 percent of single women in the private treatment report desired compensation above \$150,000, only 3 percent of single women in the public treatment do. Meanwhile, while 10 percent of women in the private treatment report desired compensation below \$100,000, 21 percent of women in public do (online Appendix Figure 8). In contrast, non-single women and single and non-single men’s reported desired compensation does not change with the treatment.

Single women also report being willing to travel significantly less in the public treatment. In the private treatment, they report being willing to travel an average of 14 days per month. However, this decreases to seven in the public treatment

²⁶For all questions where students chose a range—desired compensation, hours of work, and days of travel—we code answers as the midpoint of the chosen range. As suggested by the distribution of responses presented in online Appendix Figures 8–14, our results are robust to coding responses as the maximum or minimum of the chosen range and to different codings of the endpoint ranges.

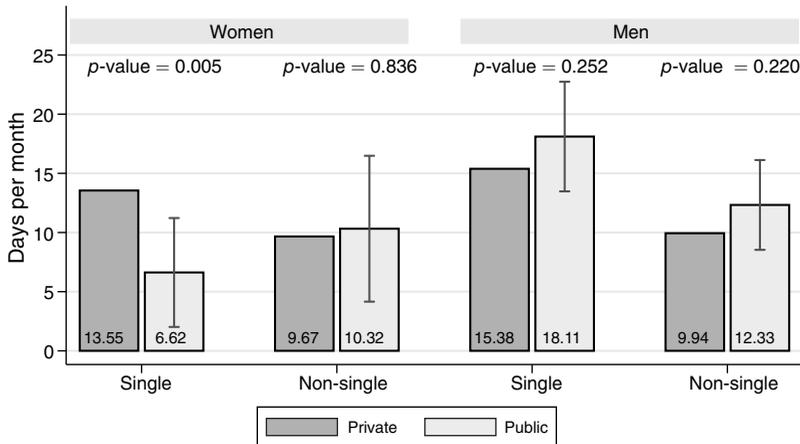


FIGURE 3. DAYS PER MONTH WILLING TO TRAVEL (*Primary Experiment*)

Notes: Students were asked how often they are willing to travel for work. Willingness to travel is coded as the midpoint of the chosen range, except for “rather not travel” (coded as 0) and “as much as necessary” (coded as 30). Whiskers show the 95 percent confidence interval calculated from regressions of the number of days per month the respondent was willing to travel on an indicator for being in the public treatment using robust standard errors. Non-single respondents are in a serious relationship, cohabiting, engaged, or married.

(Figure 3). This effect is significant at the 1 percent level using both the robust standard errors (p -value: 0.005) or a permutation test (p -value: 0.006). In the private treatment, 32 percent say they would rather not travel or are only willing to travel a few days a month. The public treatment does not increase this fraction. However, in the private treatment, 32 percent of single women report being willing to travel as much as necessary. No single women reported that in the public treatment. According to the career center, students should not be placed in consulting jobs unless they are willing to travel at least four days per week for extended periods of time. While 39 percent of single women in the private treatment reported they were willing to travel that much, only 14 percent of single women in the public treatment did. As above, the treatment did not significantly affect the reported preferences of non-single women (for which the effect is close to zero) or single or non-single men (who both report more willingness to travel in public, although the effect is not statistically significant).

In the private treatment, all four groups reported being willing to work between 51 and 53 hours per week on average (Figure 4). In the public treatment, single women reported wanting to work four fewer hours.²⁷ Very few (2 percent) reported wanting to work 40 hours or fewer per week. The disparities in the public and private treatments come at higher hours of work. For example, while 52 percent of single women are willing to work more than 50 hours per week in the private treatment, only 29 percent are willing to do so in the public treatment (online Appendix Figure 10).²⁸ However, less consistent with our hypothesis, non-single women and

²⁷The p -value of this difference for single women is 0.071 (robust standard errors) or 0.091 (permutation test).

²⁸Bertrand, Goldin, and Katz (2010) find that in only 1 of 27 job categories (management) did Chicago Booth MBA graduates work fewer than 50 hours per week on average. The two industries with the longest hours are investment banking (74 hours per week) and consulting (61 hours per week).

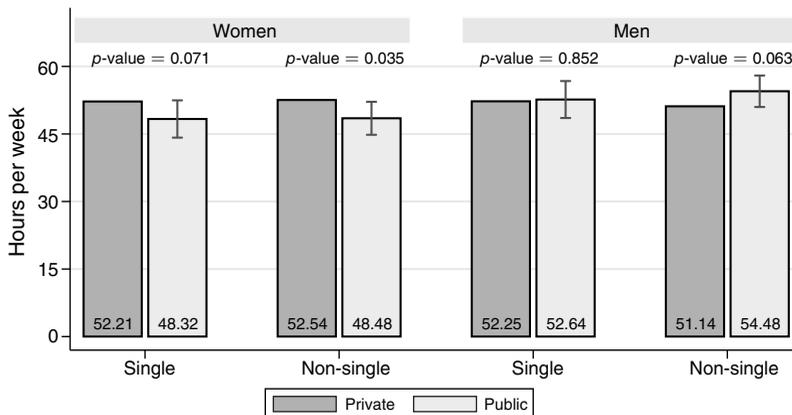


FIGURE 4. DESIRED WEEKLY HOURS OF WORK (Primary Experiment)

Notes: Students were asked how many hours per week they are willing to work on a regular basis. Desired hours of work is coded as the midpoint of the chosen range, except for “over 80” (coded as 85.5, which would be the midpoint of an 81 to 90 hour range, since ranges are 41–50 hours, 51–60 hours, etc.). Some respondents chose two or more consecutive answers. Their responses are coded as the midpoint of the full range chosen. Whiskers show the 95 percent confidence interval calculated from regressions of the number of hours the respondent was willing to work on an indicator for being in the public treatment using robust standard errors. Non-single respondents are in a serious relationship, cohabiting, engaged, or married.

non-single men both reported different desired weekly hours in the public treatment: non-single women reported a willingness to work four fewer hours, while non-single men reported a willingness to work three more hours.

Figures 5 and 6 show self-reported tendency to lead and professional ambition, reported on a 1-to-5 scale. When they think their classmates will see their responses, single women rate themselves substantially lower on both metrics.²⁹ No single woman in the public treatment rated herself as a 5 (the top rating) in either question. However, in the private treatment, 16 percent and 42 percent of single women rated themselves as a 5 on leadership and professional ambition, respectively (online Appendix Figures 11 and 12). Single women’s self-reports in the private treatment were similar to those of non-single women, single men, and non-single men, none of whose self-reports were affected by the treatment.

Figure 7 shows that, somewhat surprisingly, single women rated their comfort in competitive environments similarly in the public and private treatments. (All other groups did as well.) While this question was intended to measure individuals’ own competitiveness, as discussed above, it may be that individuals did not interpret it this way. Our focus group indicated many men prefer women who are comfortable in a range of environments. Thus, this result may be consistent with single women changing their responses in public to look less appealing to the labor market only when this can improve their marriage market prospects.

We also asked students to rate their writing skills, skills which we do not expect to be penalized in the marriage market. This was explicitly designed as a placebo

²⁹The permutation *p*-values of the effects for single women are 0.055 for tendency to lead and below 0.001 for professional ambition.

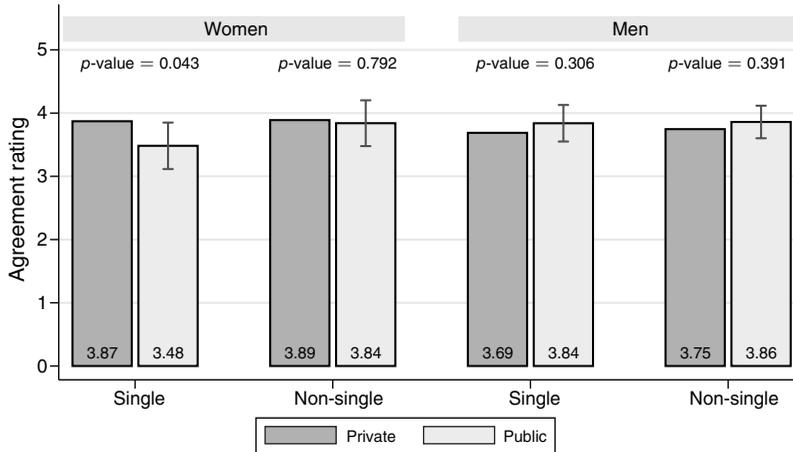


FIGURE 5. TENDENCY TO LEAD (Primary Experiment)

Notes: Students rated agreement with the statement “You tend to lead in your day-to-day interactions” on a 1–5 scale, where 1 is Strongly Disagree and 5 is Strongly Agree. Whiskers show the 95 percent confidence interval calculated from regressions of students’ answers on an indicator for being in the public treatment using robust standard errors. Non-single respondents are in a serious relationship, cohabiting, engaged, or married.

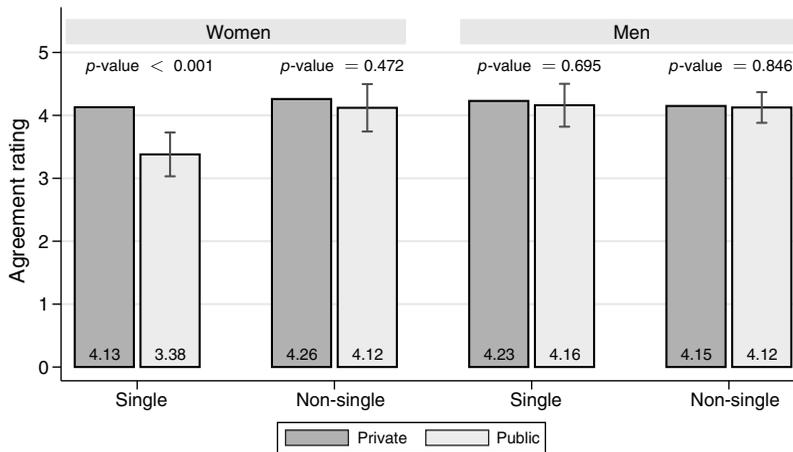


FIGURE 6. PROFESSIONAL AMBITION (Primary Experiment)

Notes: Students rated agreement with the statement “You are more professionally ambitious than your most recent work colleagues” on a 1-to-5 scale, where 1 is Strongly Disagree and 5 is Strongly Agree. Whiskers show the 95 percent confidence interval calculated from regressions of students’ answers on an indicator for being in the public treatment using robust standard errors. Non-single respondents are in a serious relationship, cohabiting, engaged, or married.

to test whether single women rate themselves more poorly on all dimensions in public or only those that may harm them in the marriage market. All four groups rated themselves highly in private: about 70 percent rated themselves as a 4 or a 5. However, neither single women nor any other group significantly changed their answers in the public treatment (Figure 8 and online Appendix Figure 14).

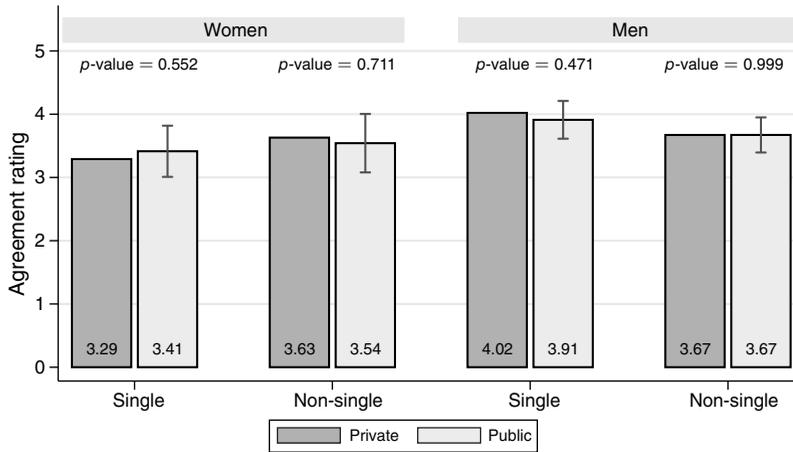


FIGURE 7. COMFORT IN COMPETITIVE ENVIRONMENTS (Primary Experiment)

Notes: Students rated agreement with the statement “You feel very comfortable in competitive environments” on a 1-to-5 scale, where 1 is Strongly Disagree and 5 is Strongly Agree. Whiskers show the 95 percent confidence interval calculated from regressions of students’ answers on an indicator for being in the public treatment using robust standard errors. Non-single respondents are in a serious relationship, cohabiting, engaged, or married.

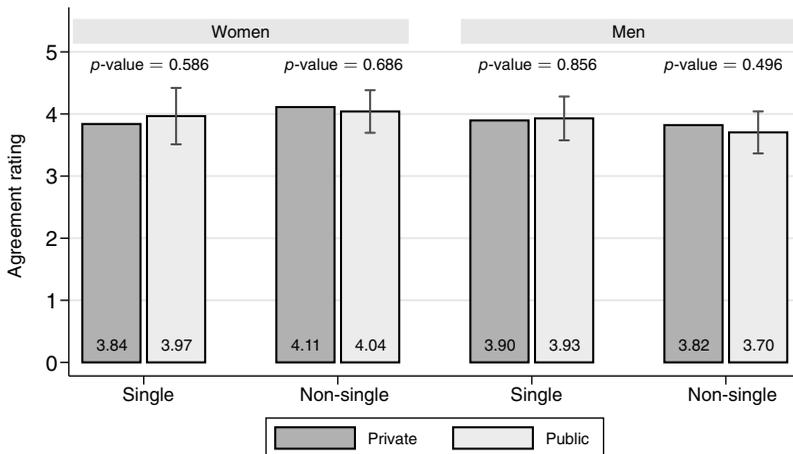


FIGURE 8. WRITING ABILITY (Primary Experiment)

Notes: Students rated agreement with the statement “You have above-average writing skills” on a 1-to-5 scale, where 1 is Strongly Disagree and 5 is Strongly Agree. Whiskers show the 95 percent confidence interval calculated from regressions of students’ answers on an indicator for being in the public treatment using robust standard errors. Non-single respondents are in a serious relationship, cohabiting, engaged, or married.

Finally, we assess how much peer observability contributes to the gender gap in responses. Online Appendix Table 5 shows the results of regressing outcomes on a female dummy separately in the public and private treatments. In the private treatment, men and women behave similarly. Men desire approximately \$11,000 more in annual compensation, but have similar willingness to travel and work long hours. In fact, despite the fact that female MBAs work fewer hours after leaving school (Bertrand, Goldin, and Katz 2010), in the private treatment, women report being

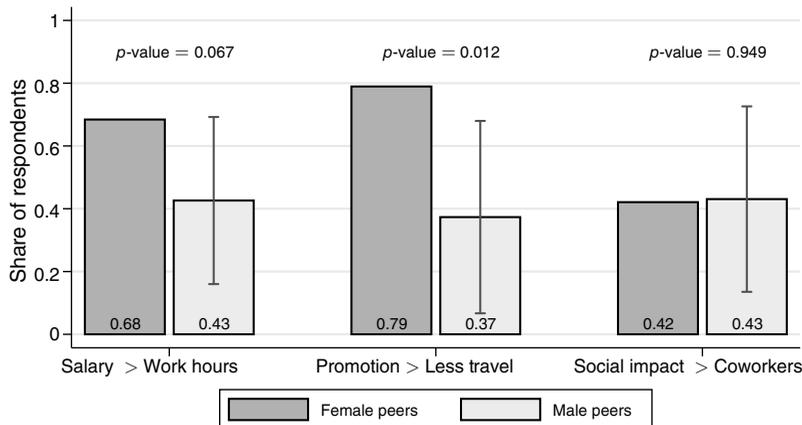


FIGURE 9. GROUP GENDER COMPOSITION AND REPORTED JOB PREFERENCES
(Supplementary Experiment, Single Women Only)

Notes: Each set of bars represents the fraction of single women who reported a preference for (i) a job with a higher salary over a job with shorter work hours, (ii) a job with better promotion opportunities over a job with less travel, or (iii) a job with a social impact over a job with more interactions with coworkers. The “Female Peers” bars show the mean for single women in all-female groups. The “Male Peers” bars are constructed by adding the treatment effect of having male peers from a regression with section fixed effects to the female peer mean. Standard errors are clustered at the group level. Only single women are included. Whiskers show the 95 percent confidence interval.

willing to work (an insignificant) 0.9 hours per week more than do men. However, gender gaps emerge in the public treatment. In the public treatment, women report being willing to travel seven fewer days per month and work five fewer hours per week. The gap in desired compensation increases by about 50 percent as well.

While we are reluctant to extrapolate the results of these regressions to gender gaps in other contexts, this analysis suggests that the trade-off between maximizing labor market and marriage market success has the potential to explain at least a part of existing gender gaps.

D. Supplementary Experiment Results

The supplementary experiment was designed to assess whether single women would portray themselves less favorably to the labor market in front of male over female peers. Only students who came to the last session of the career class participated. The two-thirds of single women who participated look similar to the remainder who did not (online Appendix Table 6). The randomization is also balanced: the characteristics of single women with male and female peers are similar, conditional on section fixed effects (online Appendix Table 7). Intended treatment was unknown to students before the experiment and does not predict participation.

Figure 9 shows the key results. The Female Peers bars contain the fraction of single women in all-female groups who chose the indicated job. Because treatment was only random within section, the Male Peers bars are calculated through regressions. First, we determine the effect of being with male (relative to female) peers from regressions with section fixed effects. Then, we add this treatment effect to the Female Peers mean. Standard errors are clustered at the group level. Online Appendix Figure 15 displays the choices of non-single women and the men.

TABLE 5—EFFECT OF GROUP COMPOSITION ON SINGLE WOMEN'S REPORTED JOB PREFERENCES
(Supplementary Experiment)

	Kling-Liebman-Katz index	Prefers higher salary over fewer hours	Prefers promotion over less travel	Prefers social impact over interactions with coworkers
<i>Panel A. Peer gender</i>				
Male peers indicator	-0.77 (0.23)	-0.26 (0.14)	-0.42 (0.16)	0.01 (0.15)
Mean for single women in female groups	0.00	0.68	0.79	0.42
Observations	40	40	40	40
R ²	0.29	0.14	0.26	0.09
<i>Panel B. Marital status of male peers</i>				
Share of male peers who are unmarried	-1.20 (0.34)	-1.23 (0.19)	0.08 (0.27)	0.44 (0.33)
Mean for single women in male groups	-0.58	0.43	0.52	0.38
Observations	21	21	21	21
R ²	0.36	0.61	0.19	0.22

Notes: Panel A shows the results of regressing either the King-Liebman-Katz index or an indicator for choosing a given job on a dummy for being in a group with male peers, controlling for section fixed effects. Panel B shows the results of regressing the same dependent variables on the share of male peers who are unmarried. Regressions are limited to single women in panel A and to single women in groups with male peers in panel B. The choices presented and the Kling-Liebman-Katz index are described in the text. Standard errors clustered at the group level are in parentheses.

The first question asked students to choose between a job with a high salary requiring 55–60 hours per week and a job with a lower salary requiring 45–50 hours per week. When placed in all-female groups, 68 percent of single women chose the higher salary job. However, with male peers, single women were 26 percentage points less likely to do so (p -value: 0.067). Similarly, when asked to choose between a job with the opportunity of quick promotion to partner but constant travel and a job with no travel but in which promotion to partner was slower and less certain, 79 percent of single women in all-female groups chose the job with better promotion possibilities. Single women were 42 percentage points less likely to do so (p -value: 0.012) when placed with male peers. Unsurprisingly, single women's reported preferences over a job with a social impact relative to a job with a collegial work environment were unaffected by peer gender.

These results are not driven by within-group correlation in responses. Consistent with students completing the questionnaires on their own, the correlation between an individual's responses and the responses of the rest of the group is close to zero, conditional on treatment status. The results are robust to adding controls for students' demographic characteristics (online Appendix Table 8). Table 5 shows regression results, including results for the Kling, Liebman, and Katz (2007) index for the two questions of interest (excluding the placebo question).³⁰ Single women decrease the career-focus of their answers on this index by approximately 0.8 standard deviations when male, as opposed to female peers, will see their answers.

³⁰ Here, when constructing the index, we use the mean and standard deviation from single women in all-female groups. Results are robust to using other groups' mean and standard deviation instead.

This effect has a p -value of 0.002 using standard errors clustered at the group level (Table 5). To account for the relatively small number of observations and groups, we also performed permutation-based inference (p -value: 0.006) and the wild cluster bootstrap- t procedure proposed by Cameron, Gelbach, and Miller (2008) (p -value: 0.008).³¹

Our group assignment procedure also generated random variation in the marital status of male peers.³² Because of limited power and the career center's belief that women would not know their group-mates' relationship status, we did not plan to utilize this variation (AEARCTR-0001774). However, with the caveat that this was not preregistered, we can assess how single women's answers change with the fraction of their male peers who are unmarried. Panel B of Table 5 shows that single women represent themselves as less career-focused when there are more unmarried—relative to married—men in their group. There is a negative and significant (at the 1 percent level) effect of the share of unmarried male group-mates on the index and the preference for a high salary relative to a better work schedule. However, there is no significant effect of this share on single women's reported preference for quick promotion relative to less travel.

These results are based on a broad variation in the share of single men across groups, and do not appear to be driven by a few outliers (online Appendix Figure 16). They are robust to the inclusion of controls (online Appendix Table 8). Given the small number of groups, we also performed inference based on permutations and the Cameron, Gelbach, and Miller (2008) wild cluster bootstrap- t procedure and find similar p -values.³³

E. Interpretation of Results

Interpreting Differences in Single and Non-Single Women's Public Behavior.—Throughout the primary experiment, single women change their answers to look less professionally ambitious—and hence less desirable to the labor market—when they believe their classmates will see their answers. Non-single women are less likely to do so. While this is consistent with our hypothesis that single women are responding to marriage market incentives, below we discuss the extent to which this is consistent with alternative explanations.

Private Behavior of Single and Non-Single Women: Unobservable differences in the way single and non-single women behave in *private* are unlikely to drive our results since both groups provide similar answers in the private treatment. This suggests that they have similar skills and career preferences. Additionally, any difference between single and non-single women that drives single women's differential responsiveness to the public treatment must be uncorrelated with their behavior in private. For

³¹ Single women were in 32 separate groups. The permutation-based p -values for the individual answers are 0.130 (prefers salary over fewer hours), 0.010 (prefers promotion over less travel), and 0.953 (placebo question). The respective bootstrap-based p -values are 0.072, 0.046, and 0.928.

³² The share of unmarried men in a group is uncorrelated with characteristics of their single female group-mates, as expected given the random assignment (online Appendix Table 7). We consider the share of men who are unmarried as opposed to not in a relationship since marital status is more observable (i.e., by wedding rings).

³³ The permutation p -value for the index is 0.050, while for the salary, promotion, and placebo questions they are 0.001, 0.851, and 0.243, respectively. The bootstrapped p -values are 0.044, 0.002, 0.762, and 0.218, respectively.

example, if the alternative explanation is that single women are more shy or humble, it also has to be the case that shyness and humility do not affect how they portray themselves to their career advisor.

Observable Differences between Single and Non-Single Women: Online Appendix Table 9 shows that observable differences between single and non-single women cannot explain their differential response to the public treatment. We regress survey responses on the interaction of the single dummy and public treatment indicator, controlling for observable characteristics (age, years of work experience, GMAT score, and US citizenship) and the interactions of these characteristics with the public treatment indicator. Regressions are limited to women and include controls for the single and public indicators themselves. If an observable characteristic other than relationship status was driving single women's differential response to the public treatment, adding these interactions would likely decrease the differential impact of the public treatment for single women. But it doesn't. For example, on the index, the regressions indicate that single women decrease their responses in the public treatment by a statistically significant 0.47 standard deviations more than do non-single women, which is similar to the 0.41 standard deviations we obtain without controls (Table 4). While adding the controls decreases power, across all outcomes the coefficients with controls are similar to the results without.

Unobservable Differences between Single and Non-Single Women: In principle, our results could be masking an unobservable difference (e.g., shyness) between single and non-single women that leads single women to be more responsive to the public treatment. Three analyses suggest this may be unlikely. First, the results in online Appendix Table 9 discussed above imply that if differences between single and non-single women's *unobservable* characteristics are driving the results, these unobservable characteristics must be correlated with women's relationship status but also have low correlation with *observable* controls. Note also that this unobservable characteristic has to be unrelated to *male* relationship status (since single and non-single men respond similarly to the public treatment). Second, in the primary experiment, to test whether single women rate themselves more poorly on all dimensions in public or only on those that may harm them in the dating market we asked students to rate their writing skills. Both single and non-single women rated their writing skills similarly in the public and private treatments. Third, the supplementary experiment finds that single women's self-portrayal varies with their audience's gender: they portray themselves less ambitiously when they are surrounded by men, especially single men.

These analyses do not completely rule out the possibility that an unobservable difference between single and non-single women is driving our results. Specifically, it may be that some women are shy about publicly revealing characteristics like ambition that are typically penalized by men in the dating market. It may be that this shyness actually makes them less likely to find a romantic partner (and, thus, more likely to be single). Under this explanation, our finding would result from a characteristic of the single women in our sample, not their relationship status directly. (It is somewhat difficult to justify though why, aside from romantic concerns, such shyness would be more likely to be activated in front of single men.)

We do not think this alternative explanation is fully inconsistent with gender norms hurting single women in the labor market. Under this explanation, it is the interaction between male norms over female desirability and some women's personality characteristics that harm women's labor market outcomes. That is, if men no longer found female ambition undesirable, perhaps these women would be as willing to publicly reveal being professionally ambitious as they are to revealing strong writing skills.

Additional Interpretation Concerns.—To help interpret our results, we present a simple model of dating market signaling in online Appendix A. In the model, there are high (H) and low (L) ambition students. Men and women are equally likely to have high ambition. Before entering business school, a random subset of students participates in a dating market. Students paired in this market enter business school as non-single, the remainder enter as single. After entering business school, students have the opportunity to sign up for a prestigious internship that (aside from dating market consequences) generates a positive net benefit only for high-ambition students. Some (randomly selected) students' sign-up decisions are publicly revealed, while other students' decisions are not. This corresponds to the public and private treatments in the primary experiment. Then, single students participate in a dating market. Eventually, all students' types are publicly revealed. After learning their partner's type, all students can pay a cost to break up their relationship and enter another dating market.

In the model, the only difference between men and women is that men prefer L partners, while women prefer H partners. The difference between single and non-single students in the public treatment is that single students' internship decisions are observed before their first dating market, while non-single students' decisions are observed after their first pairing.

In online Appendix A, we show that there exists a perfect Bayesian equilibrium with breakups along the equilibrium path in which all high-ambition women in the public treatment forgo the internship, while all other students make the internship decision that maximizes their labor market returns. Intuitively, single high-ambition women whose internship decision will be public can improve their initial match by not signing up for the internship (and thereby appearing less ambitious). This increases the odds they are first matched with an H partner. Eventually, the market will learn their true ambition and many of their H partners will break up with them. However, some H men will remain paired with their (undesirable) H partner because their (low) chance of finding a desirable L partner is offset by the breakup cost. This framework clarifies that dating market signaling can occur even when types are revealed to partners (and the dating pool) and rematching is allowed. It also helps clarify the empirical behavior of two other groups.

Why Don't Non-Single Women in the Public Treatment Signal Low Ambition?

In the theoretical framework, we assume that women who enter business school in relationships can participate in two dating markets: one before the internship decision and one after their types are revealed. This captures the idea that it takes time to separate and start dating peers. By the time these students date again, their types will be revealed, so forgoing the internship will not signal that a student is low

ambition. Moreover, their current partners will also learn their types and there is no benefit to trying to fool them with a less ambitious internship decision.

Why Don't Single Men in the Public Treatment Signal High Ambition? Given that women prefer successful male partners, one might expect single men to portray themselves as more ambitious in the public treatment. In the equilibrium in online Appendix A, men don't do this because all single women look identical in the initial dating market (all women whose decision is public forgo the internship). Even if a low-ambition man signed up for the internship, he could not get a more desirable female partner in expectation.

Of course, a similar equilibrium in which all single men sign up for the internship in the public treatment and women make the decision that maximizes their labor market returns (in public and private) is also possible. This equilibrium requires L types to be more prevalent than H types, which may be less likely in an elite MBA program.

In our model, the absence of male signaling is driven by the fact that women do not have other observable characteristics (e.g., appearance) that are correlated with male utility from the match. This is unlikely to be true in practice. However, even if this assumption is relaxed, single men will still be less likely than women to change their behavior in public if: (i) they care relatively more about their career than the dating market; (ii) women's other observable characteristics are relatively less important to men than their ambition; (iii) the cost of pretending to be ambitious is higher than pretending not to be ambitious; or (iv) single men are less likely than women to consider classmates as potential partners. This last point is consistent with the fact that male HBS alumni are less likely to be married to an alum (Ely 2015).

III. Conclusion

Single women shy away from actions that could improve their careers to avoid signaling undesirable personality traits to the marriage market. Three-quarters of single female students at an elite US MBA program report having avoided activities they thought would help their careers to avoid looking ambitious, assertive, or pushy. They are more likely to have avoided these activities than non-single women or men. Unmarried women participate much less in class than married women, despite the fact that they perform equivalently on the parts of the grade unobservable to their peers. When they expect their classmates to observe their answers, single women report substantially less career ambition in a questionnaire designed to be instrumental in finding them a summer internship. They also express much less career ambition in front of their (single) male than female classmates.

Our results have implications for understanding gender gaps in labor market outcomes. It also highlights the importance of social norms—particularly what is differentially expected from (and preferred in) a husband and a wife—in explaining gender gaps. Women make many important schooling and career decisions while looking for a romantic partner. Our results raise the possibility that a desire to succeed in the dating or marriage markets may affect choices that range from investment in middle- or high-school math to college major or industry of work that have long-term consequences for women's careers. We hope future work extends the

analysis to other contexts, explores the long-run consequences of this trade-off, and assesses interventions that may mitigate its effects on women's careers. For example, schools and workplaces often have to decide the extent to which students' and employees' actions are observable to others. Our results suggest that obscuring certain actions could affect gender gaps. In particular, our findings suggest that in some educational settings, giving a large weight to participation grades might negatively affect single women. If the goal is to get students to participate without introducing stigma considerations, practices such as "cold-calling" might be preferable to having students volunteer to answer questions.

Another open question is whether women hold accurate beliefs about men's marriage market preferences. Existing work (e.g., Fisman et al. 2006) suggests that even men in elite graduate school programs prefer less ambitious and assertive partners. Nevertheless, women may be over- or under-estimating these preferences.

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