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Do Women Avoid Salary Negotiations? Evidence from a Large-Scale Natural Field Experiment

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One explanation advanced for the persistent gender pay differences in labor markets is that women avoid salary negotiations. By using a natural field experiment that randomizes nearly 2,500 job seekers into jobs that vary important details of the labor contract, we are able to observe both the extent of salary negotiations and the nature of sorting. We find that when there is no explicit statement that wages are negotiable, men are more likely to negotiate for a higher wage, whereas women are more likely to signal their willingness to work for a lower wage. However, when we explicitly mention the possibility that wages are negotiable, these differences disappear completely. In terms of sorting, we find that men, in contrast to women, prefer job environments where the "rules of wage determination" are ambiguous. This leads to the gender gap being much more pronounced in jobs that leave negotiation of wage ambiguous.

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1. Introduction

Around the world, men occupy the higher ranks of society and are paid significantly more than women in the labor market (e.g., Bertrand 2010, Blau et al. 2010). Social scientists have theorized for decades why this might be the case, with the primary causes being gender differences in human capital (Blau and Kahn 2000); discrimination against women (Spencer et al. 1999, Goldin and Rouse 2000, Weichselbaumer and Winter-Ebmer 2007); maternity leave (Phipps et al. 2001); and gender differences in preferences (Eckel and Grossman 2008a, b; Croson and Gneezy 2009), e.g., in the willingness to compete (Gneezy et al. 2003, Niederle and Vesterlund 2007, Kuhn and Villeval 2011, Balafoutas and Sutter 2012, Charness and Gneezy 2012, Datta Gupta et al. 2013, Niederle et al. 2013, Charness et al. 2014, Dreber et al. 2014, Flory et al. 2015).

There is important laboratory and survey evidence suggesting a quite different determinant of gender differences in labor markets: men are significantly more likely to engage in salary negotiations and are better at them (Raiffa 1982, Lax and Sebenius 1986, Babcock and Laschever 2003, Babcock et al. 2006, Small et al. 2007, Greig 2008, Hall and Krueger 2012). For example, Small et al. (2007) observe that in a laboratory experiment men were nine times more likely than women to ask for higher compensation. Relatedly, Babcock et al. (2006) report labor survey data suggesting that men were eight times more likely to negotiate on salary offers. Finally, Babcock and Laschever (2003) report survey evidence that shows men are four times more likely to negotiate on first salaries and that individuals who do not negotiate first salaries lose more than $500,000 by age 60. Such large gender differences in the willingness to initiate salary negotiations potentially explain a significant fraction of the observed gender differences in wages.

In this study, we depart from a traditional investigation of gender differences by using the tools of experimental economics in actual labor markets. In our natural field experiment, we place real job advertisements to observe labor market participants' choices in their natural environment for potentially high stakes without their knowledge of being observed. Besides using a novel approach to directly test gender differences in labor market negotiations, one main contribution of our experiment is its capacity to disentangle two important levels where gender differences in negotiation might play a role: (i) sorting into negotiable-salary workplaces and (ii) initiation of salary negotiations once the person applies. Finally, by studying negotiations in labor markets, we are able to investigate not only negotiations for a higher wage but also the willingness to work for a lower wage than advertised.

We begin by exploring how two different job advertisements influence the decision to apply—one job

advertisement explicitly states that wages are negotiable ("*the position pays* \$*x*/*negotiable*"); the other leaves that aspect ambiguous ("*the position pays* \$*x*"). This investigation permits us to compare two quite different, but relevant, situations: one that is ambiguously structured so that people arrive at their own interpretations of the situation and one where the negotiations are much more concretely structured. We proceed to investigate the importance of triggering gender by placing two distinct ads: one for a "masculine" job task (involving sports) and the other for a gender-neutral job. The large sociology and psychology literatures have taught us the importance of sex-based performance stereotypes and how they cue men and women to behave in predictable ways (see, e.g., Steele 1997, Bowles et al. 2005). In this way, this design choice moves the exploration of stereotype effects from the lab to the field, and it provides a new estimate of how it might trigger behavioral responses to a situation depending on one's socially identified gender (Eagly 1987).

In total, our job advertisements were posted in nine major U.S. cities. Nearly 2,500 job seekers responded to our initial job postings. A first result is that we find that when there is no explicit statement that wages are negotiable, women are more likely to signal their willingness to work for a lower wage than advertised and slightly less likely to negotiate a higher wage than men. However, when we explicitly mention the possibility that wages are negotiable, these gender differences vanish completely, suggesting that women react more strongly to simple changes in the wage description. Our second result is based on sorting into jobs: the gender gap in applications is much more pronounced for jobs that leave the negotiation of wage ambiguous. Interestingly, this result is driven by men preferring jobs where negotiation of initial wage is ambiguous rather than when negotiations are expected. These results square well with lab evidence showing that men perform better than women in environments where negotiations are ambiguous (Bowles et al. 2005, Small et al. 2007). They are also in accord with psychological theory (e.g., Mischel 1977), which argues that situational moderators, such as ambiguity, systematically influence gender differently. Even though we find some evidence that gender triggering matters, these findings are independent of the job task and robust to local labor market conditions.

We view these findings as a new piece of evidence on the determinants of wages. Beyond providing an estimate of the importance of gender differences in sorting in the labor market and actual negotiations upon such equilibrium sorting, our data suggest that simple changes in wage descriptions can significantly affect the gender gap in labor markets. By merely adding the information that wages are negotiable, the gender gap in applications almost halves and negotiation gender differences disappear altogether, as women react to this change more strongly than men: their willingness to signal to work for a lower wage more than halves, and their attempts to negotiate increase almost fourfold.

2. Experimental Design

To investigate gender differences in job-entry decisions and provide a close link to the relevant theory, we employ a 2×2 factorial design. Our 2×2 structure varies the negotiability of wages (none versus explicit information that wages are negotiable) and the employment advertisement (general versus sports job task). Our design, which is in the spirit of Flory et al. (2015), renders it possible to disentangle the effect of the contract environment on the proportion of initially interested individuals who ultimately apply.

To carry out the 2×2 design, we employ a two-stage experimental method. In the first stage, we advertise the position without reference to the contract environment. In the second stage, after job seekers express interest in the position, we inform them of the contract environment and record whether they ultimately choose to apply for the job. These two steps are important because they allow us to randomize contract environment across subjects without affecting the normalcy of the field setting. An additional benefit is that we can collect individual characteristics even on those subjects who expressed interest but ultimately chose not to apply after they were informed about the contract environment.

We posted 18 job ads in nine major U.S. metropolitan areas (Atlanta, Dallas, Denver, Houston, Los Angeles, Portland, San Francisco, San Diego, and Washington, DC) with different local labor market conditions.[1] The ads were posted in city-specific Internet job boards in the period of November 2011 to February 2012. At the end of the experiment, we offered real jobs to applicants in every city. Ten applicants were actually hired.

2.1. Contract Environment Treatments

We investigate the role of ambiguity for gender differences in the context of salary negotiations by comparing job-seeker behavior in two contract environments. Within each given city, we randomized job seekers who expressed interest in the position into one of two contract environments, i.e., treatments (denoted as T1, where wages were not explicitly advertised as negotiable, and T2, where wages were explicitly advertised as negotiable). Subjects were only given the treatment after they had already expressed interest

[1] We selected these nine cities to represent a variety of geographical regions of the United States and to maximize the pool of job seekers from each area (all nine cities are among the top 25 most populous U.S. cities).

in the job, and they received the treatment usually within two days of expressing this interest. In both treatments, job seekers received information about the wage of the advertised job. The posted wage (usually \$17.60/hour)[2] was identical across job ads and slightly higher than the median wage for comparable jobs in most cities. To manipulate the level of ambiguity about wage negotiations in a clean manner, the only difference between the two treatments is whether we *explicitly* mentioned that the wage is negotiable. The scripts for both treatments are listed in Online Appendix A.

We were careful to create as natural an environment as possible, where we were open to questions, apologized for any questions about the job that were asked to which we did not yet respond, and welcomed further inquiries. To avoid heterogeneous treatment, we did not interact with job seekers until they decided to apply.

2.2. Employment Advertisements

To test the relevance of sex-based performance stereotypes for salary negotiations (Steele 1997), we posted in each of the nine cities two openings for *administrative assistant positions*. One ad was for a "general" ("gender-neutral") version of the job and the other for a more "masculine" version. We chose to include a masculine version as women may feel at a disadvantage and less efficacious in masculine job tasks (Beyer 1990) and thus be more likely to avoid negotiations when applying for such job tasks. In addition, it seems likely that the two positions attract different types of job seekers and that the masculine version attracts a higher fraction of men. The job ad for the gender-neutral position was looking for administrative help with fund-raising. The job ad for the masculine position was looking for someone helping with administrative assistant duties in an environment heavily focused on sports (basketball, football, baseball, soccer, auto racing, golf, tennis, and hockey).

We chose administrative assistant positions for several reasons. First, although gender gaps are most visible in occupations where high skills are necessary, large gender disparities are also present in low-skilled occupations where competitions for promotions and more lucrative jobs are also very common. Data from the U.S. Department of Labor (2011, Table 2, p. 25) show that the gender gap in wages is similar in occupations with low education requirements compared with those requiring higher education. For example, for the occupation "Office and administrative support workers, all other" that we advertised, women earned 84.3% of the median weekly earnings of their male counterparts (for high-skilled occupations, women earned 80.1% of the median weekly earnings of their male counterparts). In addition, Maxwell (2006) finds that 90% of low-skilled jobs have promotional opportunities. Second, we were able to offer real administrative assistant positions (and afford to pay salaries). Third, the tasks for these jobs could be performed at the employees' homes, which rendered it possible to advertise the positions in different cities and hire individuals from different cities. One drawback of using administrative assistant positions is that they are mainly occupied by women (79%) and thus may make extrapolations to other jobs difficult where the gender distribution is significantly different. However, because administrative assistant positions are the most common occupation in the United States (13% of the workforce; see U.S. Bureau of Labor Statistics 2010, Table 9, p. 202), and promotional opportunities and large gender disparities are common in jobs dominated by women, we believe our findings provide insights on major imbalances in the broader labor market.

The advertisements resembled other ads for similar positions and identified who we were and where we were located, and the ads said that we were looking for an administrative assistant in their area. We chose to explicitly identify a genuine organization to minimize any risk of suspicion. Having a genuine employee of the organization sign off on the email added further insurance, should any job seekers wish to do a brief Internet search to verify the ad's authenticity. The job ads can be found in Online Appendix A. The advertisement ended with a single sentence requesting interested job seekers to email their curriculum vitae or résumé. The advertisement was signed from a current employee of our organization.

2.3. The Response Variables and Job-Seeker Characteristics

We are interested in the individual decision of whether or not to apply and whether or not to negotiate. Our subject pool consists of every individual who contacted us to express interest in the job. To actually apply, however, the interested job seeker had to fill out the interview questionnaire and send it back to us. We therefore classify all subjects who returned the questionnaire to us as having applied and those who did not return the questionnaire as having not applied.

In the interview questions, we checked whether or not job applicants asked for a higher wage or signaled a willingness to work for a lower wage. More precisely, four individuals independently classified the job applicants' responses into three categories: (1) signaled willingness to work for a lower wage than advertised, (2) did not signal willingness to work for a lower wage but did also not negotiate for a higher wage, and (3) negotiated for a higher wage. If there was disagreement among the different raters, the

[2] See Online Appendix B for more information on posted wages. (Online appendices available at https://sites.google.com/site/leibbrandt/research.)

job applicant's response was classified following the majority rating. If there was a tie, one rater served as the tiebreaker. The overall interrater reliability is $k = 0.656$ ($z = 47.42$, $p < 0.0001$).[3]

Typical cases of negotiation for a higher wage include the following: "The wage of \$17.60/hr does not really meet my expectations. My desired wage would be closer to \$20/hr," "The wage is good, although my minimum is usually \$19–\$21 per hour. I have 20 years of comprehensive admin experience to offer," or "My desired wage is \$21/hr, but I am open to negotiation." Typical cases for signaling accepting a lower wage than advertised were as follows: "The pay exceeds my expectations. I am willing to work for a minimum of \$12," or "My previous job paid less, my desired wage is \$15."

To determine gender and not disrupt the normalcy of the field setting, we used each subject's first name and employed a three-tier method.[4] For the vast majority of names, we used the Social Security Administration (SSA) database on name popularity by gender and birth year to assign gender based on probabilities.[5] For names that are not included in the SSA database, we used an additional database (Baby Name Guesser, available at http://www.gpeters.com/names/baby-names.php, accessed December 2011), which calculates gender ratios by first name using the Internet to analyze patterns of name usage for more than 100,000 first names. We also used this second database as an additional check on the SSA-based assignments in cases where the gender ratio derived from the SSA database was too low to confidently assign one gender or the other. Finally, for all names where neither database yielded a large enough gender ratio to make a confident assignment (i.e., smaller than 2:1), we performed Internet searches for gender identifiers of the actual subjects themselves, e.g., by finding the subjects on social networking websites.

The remaining individual characteristics of interest (level of education and job experience, i.e., whether a job seeker has already worked as an administrative assistant) were gathered from the résumés sent to us by the subjects.

[3] A value of 0.656 for the Cohen's kappa is categorized as "good" in Fleiss (1981).

[4] Note that directly asking for gender could have altered the subject's decision of whether or not to apply, and it also has important legal implications.

[5] We used the SSA database to calculate a weighted gender probability for each first name. The database reports figures on the most common 1,000 names for men and women born in any given year. We would take a given name, proceed to use the number of men and women born each year with that name, and then create a gender ratio for that name in each given year. We then looked across multiple years to create a weighted average of this gender ratio. A more detailed description of the procedure can be found in Flory et al. (2015).

3. Experimental Results

We report data from all 2,422 job seekers who signaled interest in our job ads.[6] We could identify gender from 2,382 of the 2,422 job seekers. Approximately two-thirds of the job seekers were female ($n = 1{,}590$). Overall, 36.2% ($n = 863$) filled out the application questionnaire and decided to apply. Our negotiation classification finds that 14.3% of these job applicants tried to negotiate for a higher wage ($n = 123$) and 8.5% signaled their willingness to accept a lower wage ($n = 73$). We achieved our goal to attract different job-seeker pools for the two job ads, as we observe that the gender distribution depends significantly on the job ad. For the job ad with the gender-neutral job task, 78.7% of the applicants were female ($n = 930$), whereas for the job ad with the masculine job task, only 55% were female ($n = 660$; Fisher's exact test, $p < 0.001$).

The job seekers were randomized into treatments T1 ($n = 1{,}187$) and T2 ($n = 1{,}195$), in which we varied whether wages were explicitly negotiable. Overall, the application probability is almost identical across treatments (Fisher's exact test, $p > 0.701$). Table 1 presents a summary of the job seekers and their decisions to apply and negotiate depending on gender, treatment, and job task. Table 2 shows the number of observations and application probabilities for the job ads posted in the nine different cities.

3.1. Sorting into Jobs with Negotiable Wages

Figure 1 illustrates the application probabilities depending on treatment and gender. First, we observe that women are overall less likely to apply than men (32.5% versus 43.8%; Fisher's exact test, $p < 0.001$), a general pattern that is also reported in Flory et al. (2015). Second, interestingly, the gender gap in application probabilities is more pronounced in T1 than in T2. In T1, women's application probability is 31.9% and men's application probability is 46.6%. In contrast, in T2, women's application probability is slightly higher (33.0%; $p = 0.630$, Fisher's exact test), whereas men's application probability is lower (41.2%; $p = 0.133$, Fisher's exact test). Thus, the gender gap almost halves (from 14.7% to 8.2%) when moving from T1 to T2.

In Table 3, Models (1) and (2) present logit regressions with the decision to apply as the dependent variable. Model (1) uses as controls treatment, gender, the interaction treatment × gender, job task (masculine or gender-neutral), the interaction treatment × job task, and city fixed effects to account for different application probabilities across cities. Model (2) makes use of two additional variables indicating the job seekers'

[6] For completeness, these data include pilot and nonpilot data. In Online Appendix B, we exclude data from job ads that may be considered as pilots and show that our findings are robust to this exclusion.

Table 1 Summary of Job Seekers

	Interest in job		Job applications		Wage negotiations	
Women						
Total	1,590		516		120	
Per treatment	803 (T1)	787 (T2)	256 (T1)	260 (T2)	49 (T1)	71 (T2)
Per job task	930 (general)	660 (sports)	264 (general)	252 (sports)	64 (general)	56 (sports)
Men						
Total	792		347		76	
Per treatment	384 (T1)	408 (T2)	179 (T1)	168 (T2)	30 (T1)	46 (T2)
Per job task	252 (general)	540 (sports)	77 (general)	270 (sports)	14 (general)	63 (sports)

Notes. Each observation constitutes one job seeker. Wage negotiations include upward and downward negotiations.

qualifications (education and job experience) and their interactions with treatment to account for potential gender differences in job-seeker qualifications.

We observe that the T2 × gender interaction is significant at $p < 0.05$ in both models. This provides evidence that women are not more but are less likely than men to sort out of workplaces that explicitly offer negotiable wages. The effect size is economically large: the gender gap in application probabilities shrinks by 8.7 percentage points in application probabilities, which is approximately 24% of the mean overall application probability. Models (1) and (2) also show that application probabilities for men are higher for the sports job ad (variable: *male sports task*) and that men's willingness to enter workplaces with explicitly negotiable wages compared with workplaces without explicitly negotiable wages is higher for the sport job ad (variable: $T2 \times$ *male sports task*). Model (2), in addition, shows that job seekers with at least a bachelor's degree are significantly more likely to apply than those with not as much education.

Interestingly, we also observe that the T2 dummy is significantly negative ($p < 0.05$), showing that men avoid T2 when the job task is general. The men's preference for contract environments that leave wage negotiations ambiguous is well in line with psychological theory (Mischel 1977) and complements survey evidence on salary negotiation performance suggesting that men receive a higher salary than women especially when negotiations are ambiguous (Bowles et al. 2005).

Table 2 Summary of Job Advertisements

City	Job task	Job seeker (*N*)	Application probability
Atlanta	General	164	0.26
	Sports	207	0.39
Dallas	General	68	0.18
	Sports	126	0.37
Denver	General	153	0.35
	Sports	153	0.5
Houston	General	158	0.3
	Sports	87	0.3
Los Angeles	General	114	0.35
	Sports	146	0.52
Portland	General	110	0.32
	Sports	70	0.49
San Francisco	General	136	0.26
	Sports	150	0.47
San Diego	General	66	0.35
	Sports	108	0.49
Washington, DC	General	213	0.25
	Sports	153	0.4

Online Appendix Figure A illustrates the application probabilities depending on treatment and job task. This figure shows that the gender gap in application probabilities decreases when going from T1 to T2 regardless of whether the job task is neutrally framed (general job advertisement) or in favor of men (sports job advertisement). We view this as an additional piece of evidence suggesting the robustness of our previous finding. Online Appendix Figure B illustrates the application probabilities depending on treatment and gender in nine different U.S. cities in which the job ads where placed. It shows that there are differences in application probabilities across cities but that the patterns when moving from T1 to T2 are similar across genders in a given city. There is no city where males' application probabilities increase and at the same time females' application probabilities decrease when moving from T1 to T2. In contrast, in Atlanta, Denver, and San Diego, males' application probabilities decrease from T1 to T2 while females' application probabilities increase. This suggests the robustness of our previous finding that women are not less likely to sort out of negotiable employment contracts.

Result 1. The gender gap in job applications shrinks when wage negotiations are expected compared with when wage negotiations are ambiguous.

3.2. Wage Negotiation

We continue with the analysis of the actual willingness to negotiate wages. Are women less likely to negotiate on wages and more willing to accept lower wages than advertised? First, we observe that our treatment manipulation has successfully induced negotiations. Indeed, there are large and significant treatment differences in the probabilities of negotiation initiations (Fisher's exact test, $p < 0.001$). In T2, negotiations for a higher

Figure 1 Percentages of Job Applications Conditional on Interest and Depending on Treatment and Gender for Both Jobs

Notes. There are two treatments: in T1, the wage description did not explicitly mention that wages are negotiable; in T2, the wage description did explicitly mention that wages are negotiable. The dark (light) bars illustrate the application probabilities for men (women). The arrows indicate the gender gap in job applications in both treatments.

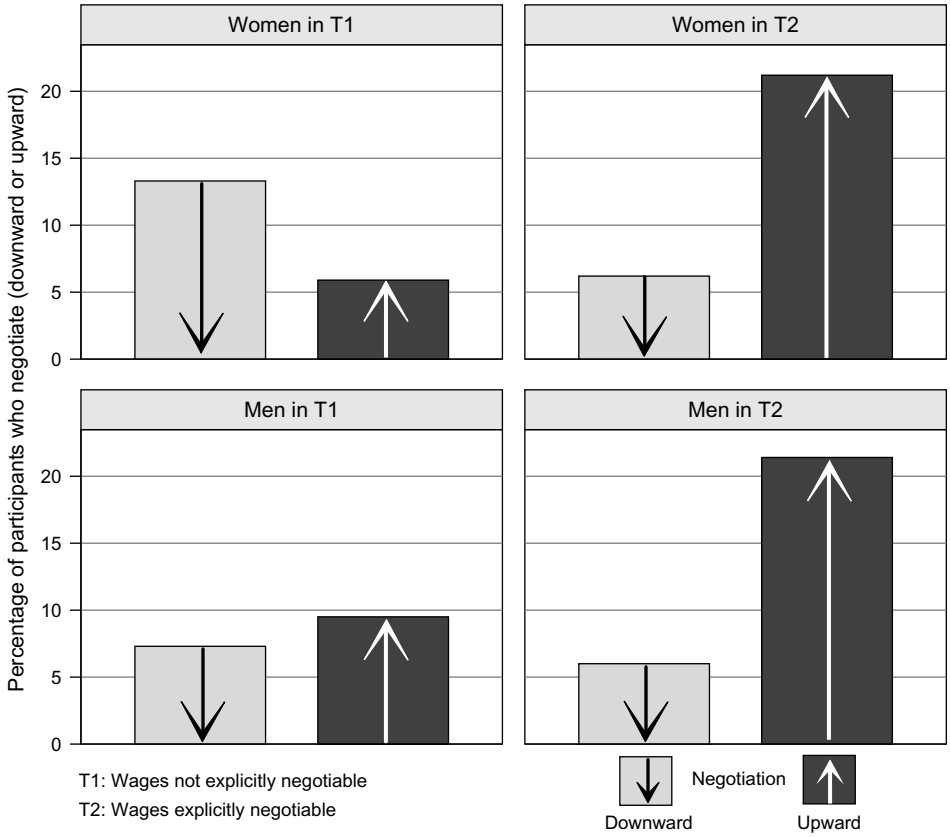
Table 3 Negotiation Probabilities

	DV = Decision to apply (yes, no): logit		DV = Decision to negotiate (negotiate downward, no negotiation, negotiate upward): ordered logit		DV = Decision to negotiate upward (no negotiation, negotiate upward): logit	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
T2	−0.208***	−0.198**	−0.010	−0.031	0.052	0.091
	(0.077)	(0.090)	(0.049)	(0.055)	(0.099)	(0.122)
Female	−0.114***	−0.105***	−0.036	−0.035*	−0.044	−0.049
	(0.029)	(0.031)	(0.017)	(0.018)	(0.044)	(0.043)
T2 × *Female*	0.087**	0.087**	0.047*	0.053*	0.064	0.073
	(0.041)	(0.044)	(0.026)	(0.027)	(0.054)	(0.055)
Male sports task	0.075***	0.078***	−0.007	−0.006	−0.003	0.007
	(0.028)	(0.030)	(0.017)	(0.018)	(0.046)	(0.049)
T2 × *Male sports task*	0.100**	0.119***	0.013	0.006	−0.007	−0.034
	(0.040)	(0.042)	(0.026)	(0.028)	(0.056)	(0.059)
Education		0.062**		0.044**		0.059
		(0.029)		(0.019)		(0.049)
T2 × *Education*		0.014		0.033		0.047
		(0.042)		(0.027)		(0.059)
Job experience		−0.011		0.020		0.129**
		(0.031)		(0.018)		(0.056)
T2 × *Job experience*		−0.022		0.009		−0.086
		(0.043)		(0.027)		(0.064)
City fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Wald χ^2 (Prob > χ^2)	100.42 (0.000)	109.48 (0.000)	54.87 (0.000)	86.04 (0.000)	59.64 (0.000)	71.88 (0.000)
N	2,382	2,116	863	805	790	734

Notes. Shown are the decision to apply (Models (1) and (2)), decision to negotiate upward and downward (Models (3) and (4)), and decision to negotiate upward (Models (5) and (6)), depending on treatment and gender. Coefficients show average marginal effects. Robust standard errors are in parentheses. The comparison group is T1. *T1* = wages were not explicitly negotiable; *T2* = wages were explicitly negotiable. *Education* is a binary variable equal to 1 if the job seeker has at least a bachelor's degree and is equal to 0 otherwise. *Job experience* is a binary variable equal to 1 if the job seeker has worked before as an administrative assistant and is equal 0 otherwise. DV, dependent variable.

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Figure 2 Negotiation Probabilities for Two Jobs Advertised in Nine Major U.S. Cities Depending on Wage Description and Gender



Notes. There are two wage descriptions: in T1, the wage description did not explicitly mention that wages are negotiable; in T2, the wage description did explicitly mention that wages are negotiable. The upper row shows women's negotiation probabilities depending on the wage description, the lower row men's negotiation probabilities. The light grey bars indicate negotiation downward (signaling willingness to accept a lower wage than advertised), and the black bars indicate negotiation upward (signaling willing to accept only a higher wage than advertised).

wage occurred almost three times more often than in T1; 21.3% of the job applicants started to negotiate on the wage in T2, whereas only 7.4% in T1. In addition, the treatment manipulation has decreased the signaling to accept a lower wage than advertised by over 40% (T1: 10.8%, T2: 6.1%).

Figure 2 illustrates the negotiation probabilities depending on gender and treatment. We observe first that women are more likely to negotiate downward (13.3%) than upward (5.9%) if the wage description is ambiguous (T1), whereas the opposite holds for men (7.3% versus 9.5%). Comparing women's and men's signaling to accept a lower wage to their negotiation for a higher wage, we find a significant difference of the difference-in-difference at $p = 0.033$ (Fisher's exact test, two sided). If we restrict the sample to job seekers who either signal to accept a lower wage or do not signal, the difference is significant at $p = 0.081$ (Fisher's exact test, two sided), and if we restrict the sample to those who either negotiate for a higher wage or do not negotiate, the difference is insignificant at $p = 0.264$ (Fisher's exact test, two sided).

However, the right panel shows that these gender differences disappear altogether when wages are explicitly announced as negotiable ($p = 1$, Fisher's exact test, two sided). In T2, women are equally likely to negotiate as men (21.2% versus 21.4%) and equally hesitant to signal willingness to accept a lower wage (6.2% versus 6.0%). This provides evidence that women react more strongly to wage descriptions than men. Whereas women's attempts to negotiate a higher wage when we explicitly mention that the wage is negotiable increase by a factor of 3.6, men's only increase by a factor of 2.3. In addition, whereas women's willingness to signal working for a lower wage decreases by more than half when wages are advertised as negotiable, men's willingness decreases by less than a fifth.

Models (3) and (4) in Table 3 present ordered logit regressions with the decision to negotiate (three categories: downward, no, upward negotiation) as the dependent variable restricted to the sample of job applicants. These two models correspond to the first two models and thus take into account of city effects, treatment × job task interactions, and treatment × job seeker qualification interactions (only Model (4)).

We observe that the female dummy is negatively significant ($p < 0.053$), showing that women are significantly less likely to negotiate for a higher wage and more likely to signal their willingness to accept a lower wage than men in T1. In addition, we observe in both models that the treatment × gender interaction is significantly positive ($p = 0.066$ in Model (3), $p = 0.05$ in Model (4)), indicating that women react more strongly to the treatment than do men. The probability to move one category up toward negotiating a higher wage increases on average by 4.7–5.3 percentage points, which is substantial given that in the complete sample only 14.3% negotiate on a higher wage. Models (5) and (6) present logit regressions with the decision to negotiate using only two categories (no, upward negotiation) and excluding job applicants who have indicated a willingness to accept a lower wage. The treatment × gender interaction is positive and large (6.4–7.3 percentage points) but insignificant ($p = 0.237$ in Model (5), $p = 0.183$ in Model (6)), indicating that there is a trend that women react more strongly to the treatment. Online Appendix Figures C and D illustrate the negotiation probabilities depending on treatment, gender, and job task and suggest that the previous findings are largely robust across job tasks.

Result 2. Women are less likely than men to initiate wage negotiations and more likely to offer working for lower wages when wages are not advertised as negotiable. However, when wages are advertised as negotiable, these differences disappear and both gender are equally likely to negotiate and equally hesitant to offer working for lower wages.

4. Discussion

Salary negotiations have the potential to crucially determine labor market outcomes, and gender differences in negotiations may be an important cause of existing gender differences in labor market outcomes. One major challenge to better understanding the determinants of salary negotiations is that they are difficult to observe in their natural environment. By using a natural field experiment, we were able to observe actual and significant salary negotiations in naturally occurring labor markets without the knowledge of job market participants. The experimental setup allows us to cleanly study whether there are gender differences in the willingness to apply for jobs with negotiable wages and to initiate wage negotiations.

We find that minimal manipulations of wage descriptions can significantly shift the gender composition of the applicant pool. By merely adding a single piece of information that the wage is "negotiable," we successfully reduced the gender gap in job applications by approximately 45%, largely because of men's preference for jobs that do not specify the possibility to negotiate initial wages. Furthermore, as we find that making explicit that wages are negotiable motivates women more than men to initiate negotiations for a higher wage, we show how details of the contract environment have important effects on the gender gap, and with such knowledge, public officials can design laws to take advantage of such effects.

Our study, to our knowledge, is a first attempt at using a natural field experiment to investigate gender differences in the willingness to enter negotiations and negotiable workplaces in actual labor markets. One should keep in mind, however, that one particular feature of our experiment is that there is little social interaction between the job seekers and the employers. This may relieve pressure from gendered social roles, reduce backlash against women who negotiate (Bowles et al. 2007), and thus lead to an underestimation of gender differences in negotiations (Walters et al. 1998, Stuhlmacher et al. 2007). More research is certainly warranted to improve our understanding of the role of negotiations in workplaces and how they relate to gender differences in labor market outcomes. For instance, it may be that there are gender differences for other labor market negotiations than we observe, such as salary negotiations after initial hire, that may help explain why women earn less than men. In addition, it is entirely possible that women are less likely than men to negotiate wages for other jobs than we advertised or that there are gender differences in negotiation styles and outcomes (Gerhart and Rynes 1991).

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