Descriptive Norms and Gender Diversity: Reactance from Men

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Abstract:
Descriptive norms provide social information on others' typical behaviors and have been shown to lead to prescriptive outcomes by "nudging" individuals towards norm compliance in numerous settings. This paper examines whether descriptive norms lead to prescriptive outcomes in the gender domain. We examine whether such social information can influence the gender distribution of candidates selected by employers in a hiring context. We conduct a series of laboratory experiments where 'employers' decide how many male and female 'employees' they want to hire for male- and female-typed tasks and examine whether employers are more likely to hire more of one gender when informed that others have done so as well. In this set-up descriptive norms do not have prescriptive effects. In fact, descriptive norms do not affect female employers' hiring decisions at all and lead to norm reactance and backlash from male employers when informed that others have hired more women.

Keywords: Choice, Decision Making, Gender Norms, Nudge, Framing, Reactance, Backlash

Descriptive norms provide information on others' typical behaviors and can serve as a potential policy tool to "nudge" individuals towards norm compliance (Thaler & Sunstein, 2008). For example, citizens are more likely to vote when they are informed of high rather than low turnout in a previous election (Gerber & Rogers, 2009). Similarly, when told that a majority of individuals do so, people are more likely to pay their taxes, donate, recycle, preserve energy and take environmentally conscious decisions (Allcott, 2011; Allcott & Rogers, 2012; Cialdini, 2003; Cialdini, Reno, & Kallgren, 1990; Croson & Shang, 2008; Frey & Meier, 2004; Goldstein, Cialdini, & Griskevicius, 2008; Martin & Randal, 2008). The effect of descriptive norms has also been shown in decisions that involve relatively high stakes for the individual: one's employment decision (Coffman, Featherstone, & Kessle, 2014). Generally, making people aware of social norms has had prescriptive effects, leading to increases in norm-consistent behavior (Kwan, Yap, Chiu, 2015). Moreover, descriptive norms have been shown to encourage conformity regardless of social desirability. For example, emphasizing that many others steal petrified wood from the forest makes people more likely to do the same (Cialdini et al., 2006) and individuals observing others interacting in a racially biased manner increase their own racial bias (Willard, Isaac & Carney, 2015).

This paper examines whether descriptive norms have prescriptive impacts on gender diversity. Specifically, we examine whether social information can influence the gender composition of 'employees' selected by 'employers' in a hiring context.

In contrast to the norm nudges applied in other domains, most discussions concerning gender diversity focus peoples' attention on the lack of women in traditionally male-dominated (and to a lesser extent, lack of men in traditionally female-dominated) fields. For example, the Economist (2014) reports, "Almost everywhere women are in a minority in government cabinets." The UN Women's (2015) website also states, "Women are underrepresented as voters, as well as in leading positions, whether in elected office, the civil service, the private sector or academia." In the US, low percentages of women senators (20%), Fortune 500 CEOs (4.8%), women serving on boards (16.9%) and tenured faculty (21.2%) are often cited examples (Catalyst Research, 2014a, 2014b; Curtis & Thornton, 2013-2014; Rutgers University, 2016). The fact that only 22 percent of members of parliament across the world are women remains the focus of discussion regarding underrepresentation of women in political leadership (Inter-Parliamentary Union, 2016). Similarly, while not discussed quite as much as the "missing women" in leadership positions, the "missing men" in elementary school education (with, for example, only 10.2 percent male elementary school teachers in the US) has garnered attention in academia and the popular press (Goldring, Gray, & Bitterman, 2013).

According to the available research on social norms, the focus on the under-representation of a particular group could potentially be turning descriptive statistics into prescriptive norms that suggest for the fraction of the underrepresented gender in these settings to be kept small. This paper aims to determine if this is in fact the case and whether different information, focusing on majority behavior, would have similar prescriptive effects as in other domains. For example, in contrast to focusing on the absence of women in leadership or men in teaching, one could focus on the majority of companies with gender diverse boards or the majority of schools with teachers from diverse backgrounds.

What impacts descriptive norms have on the gender composition of a group is truly an empirical question given that the gender domain is quite different from the other areas in which descriptive norms have been studied thus far. A handful of earlier studies suggest that descriptive norms are not effective in nudging behavior in every domain and may even lead to increases in undesirable behaviors. For example, peer social norm information has had negative effects on the academic performance of the lowest ability students (Carrell, Sacerdote, & West, 2011) and savings of certain employees (Beshears, Choi, Laibson, Madrian, & Milkman, 2011). In addition, Costa and Kahn (2013) find that unlike Democrats, when Republicans were made aware of their relatively low electricity usage, they turned up their thermostat and switched off the light less often.[1] The authors propose that this "boomerang effect" may be the result of Republicans not believing that reducing energy saves the planet and thus not having internalized the norm that considers the reduction of energy usage to be a good thing. Maybe, for a descriptive norm to lead to prescription, the recipients may need to have internalized the norm to some extent.

This may be especially relevant in the gender domain, as gender diversity might not be generally accepted or desired. Increasing gender diversity in an organization may well have distributive consequences, requiring the overrepresented gender to become less represented. Thus, descriptive norms emphasizing the underrepresented gender's gains could lead to perceived intergroup threat by the traditionally overrepresented gender. This could motivate members of the traditionally favored group to take actions that protect or improve their gender identity and status (Jetten, Spears, & Postmes, 2004; Schmitt, Lehmiller, & Walsh, 2007; Tajfel, 1982), resulting in backlash (Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2009; Koenig, Ahmed, Hossain, & Mozumder, 2003; Luke & Munshi, 2011; Willer, Rogalin, Conlon, & Wojnowicz, 2013).

Understanding the impact of descriptive norm information in the gender domain may inform approaches used to increase gender diversity. This has become a goal in a large number of settings, including politics (Chattopadhyay & Duflo, 2004; Krook, 2009), science, technology engineering and math (STEM) fields (Handley, Brown, Moss-Racusin, & Smith, 2015; Stout, Dasgupta, Hunsinger, & McManus, 2011) and business (Ahern & Dittmar, 2012; Bohnet, 2016; Davies, 2014). Indeed, some policy makers have already started to incorporate norm nudges in their gender-related communication. In 2011, then Secretary of State for Business, Innovation and Skills in the UK, Vince Cable, initially talked about the lack of women on corporate boards arguing that "Currently 18 FTSE 100 companies have no female directors at all and nearly half of all FTSE 250 companies do not have a woman in the boardroom" (UK Government, 2011). Later, in 2013, he switched to focusing on the fraction of boards which are gender diverse: "Currently 94 of the FTSE 100 companies count women on their boards as do over two thirds of all FTSE 350 companies" (UK Government, 2013). While the fraction of women on corporate boards in the United Kingdom increased dramatically from 12.5 percent in 2011 to 22.8 percent by the end of 2014 and to more than 25 percent by 2015 (Davies, 2011, 2014, 2015), the UK employed a large number of approaches to move the needle. Therefore, because of the absence of a controlled environment, we cannot draw any inferences about the specific impact of the norm nudges used on gender diversity.

This paper attempts to address this by running a series of laboratory experiments to study how descriptive norms affect the gender diversity of hiring decisions. Specifically, we have

'employers' decide how many male and female 'employees' they want to hire for male- and female-typed tasks and examine whether employers are more likely to hire more of one gender when informed that others have done so as well. In our experiments, descriptive norms did not have prescriptive effects on gender diversity. In fact, descriptive norms did not affect female employers' hiring decisions at all and led to male reactance when the descriptive norm information favored female candidates. When informed that others had hired more women, male employers hired fewer female candidates than when no norm information was given.

The sections that follow discuss the conceptual frameworks, introduce the experimental design, and present our results. Finally, the last section concludes and discusses our research's implications.

Conceptual Framework: Norm Conformity and Norm Reactance

The existing literature on descriptive norm nudges hinges on the theory that individual decision makers like to conform to social norms. Norm conformity is supported by numerous studies where descriptive norms have led to norm-consistent behavior (Cialdini et al., 2006).

However, gender-based descriptive norm nudges may not necessarily have prescriptive effects, and instead, result in norm reactance. Some of the possible reactance channels apply to all employers, independent of their own gender. Others are particularly relevant for one sex only and may interact with the sex of the employee. Our experiments will allow us to distinguish among norm conformity and the two possible reactance channels.

Reactance from all: Norm information might conflict with people's preferences for equality and fairness. Therefore, if a norm favors one gender over another, individuals may seek to correct for the perceived inequality. If indeed preferences for equality are at play, we should observe this behavior regardless of the gender being disfavored. Therefore, if employers only choose to correct for the inequality faced by one gender and not another, this cannot be driven by preferences for equality.

Another explanation for observing norm reactance from all could be due to the norm information conflicting with individuals' preconceived notions, or stereotypes, of the appropriate fractions of men and women that should be engaged in a particular task. This may lead them to correct the wrongs others have committed. For example, people may believe that teaching is a woman's job and leading, a man's. If others have chosen more male teachers and more female leaders than an individual deems appropriate, he or she may want to compensate for this. This explanation is not generic to gender but could apply to any domains where people's beliefs about what is right conflict with the norm (Costa & Kahn, 2013).

Reactance from the disfavored gender: In many of the domains studied so far, e.g., voting or energy conservation, norm-conformity may be individually costly but makes everyone else better off. Conforming to the norm means contributing to a public good. In contrast, the gender domain raises distributive concerns and can lead to intergroup threat: an increase in gender diversity requires the overrepresented gender to become less represented, reducing the

group's relative numbers and potentially, its status (Tajfel, 1982; Tajfel & Turner, 1986). If the norm information threatens the representation and status of the members of specific groups, this can motivate them to take actions that improve their group's social identity (Fiske, Cuddy, Glick, & Xu, 2002; Jetten et al., 2004; Roccas & Schwartz, 1993; Schmitt et al., 2007; Tajfel, 1982). Therefore, this zero-sum environment may lead to resistance, instead of conformity, by the group being disfavored by the norm information.

Reactance from men: High-status group members may be more likely than the low-status group to view increases in intergroup equality negatively, namely, as a loss to their higher status (Eibach & Keegan, 2006; Sidanius & Pratto, 1999). As a result, when descriptive norms provide unfavorable information about their gender group's status, norm-reactance might be particularly pronounced amongst the traditionally higher-status group: men. Indeed, while evidence on the strength of typical group identification by men and women is mixed (Rudman & Goodwin, 2004; Schmader, 2002; Spoor & Schmitt, 2011), studies suggest that men respond more strongly to intergroup threat than women (Hong & Bohnet, 2007; Van Vugt, De Cremer, & Janssen, 2007). For example, Spoor and Schmitt (2011) found that when made aware of women's progress over the past few decades, young men reported high levels of anxiety and a strong sense of solidarity and protectiveness towards their own gender, whereas women reported weaker group identification in response to intergroup comparisons.

Moreover, studies have found support for the masculine overcompensation thesis, where "men react to masculinity threats with extreme demonstrations of masculinity" (Willer et al., 2013). For example, when the socially prescribed dominance of men is challenged by increased female economic independence, studies have found evidence of male backlash in the form of increased domestic violence (Koenig et al., 2003; Luke & Munshi, 2011). In addition, men have shown reactance towards female leadership. Beaman et al. (2009) find that while all men demonstrate a strong explicit bias against women leaders, this bias was worsened in areas where men were required to elect a female leader under a quota system (even though male implicit preferences for female leaders remained unaffected) as compared to areas where there was no quota for female leadership. Accordingly, norms that provide information on improved female status and emphasize women's position of gain may be perceived as threats to male masculinity and incite "masculine protest" (Adler, [1910] 1956).

The following sections present our experiment where we test the impact of descriptive norm information and distinguish between the three possible channels of influence leading to norm reactance, backlash from all, backlash from the disfavored gender and backlash from men.

Experimental Design

We examine the effect of descriptive gender norm information on hiring decisions that involve male and female 'employees' (i.e., laboratory subjects assigned to this role) using a series of laboratory experiments. The experimental design consisted of two stages. In Stage 1, by observing the hiring decisions of a set of 'employers' (laboratory subjects assigned to this role), we gathered the data needed to establish the gender norms in hiring. In Stage 2, the impact of these gender norms on the hiring decisions of another set of employers was studied. The individual stages of the experimental design are explained in turn below.

Stage 1: Creating Gender Norms

In the first stage of our experiment, we ask a set of employers to decide which employees they want to hire for both a stereotypical male-typed task (a math task) and a stereotypical female-typed task (a word task).[2] The set of candidates that were described to the employers were preselected from an existing pool of study participants that had previously participated in three rounds of the tasks (Bohnet, van Geen, & Bazerman, 2016).[3] These candidates were preselected so that characteristics and performance distribution were as comparable as possible across genders.

Our employers were presented with 10 male and 10 female candidates to choose from for both, the math and the verbal task. To prevent potential framing effects, the candidates were (truthfully) referred to as "previous participants" to the employers and their individual information was presented to the employers on randomly ordered index cards that displayed (i) participant number, (ii) gender, and (iii) performance scores for two rounds on the task under consideration. In order to reduce the salience of gender, information on participant race, nationality, and whether they were a Boston area resident was also included.[4] The stack of twenty candidates for each task had similar mean and variance in their scores although this information was not provided to the subjects. Table 1 presents an overview of candidate characteristics.

Table 1
Descriptive Statistics of Candidates

Twenty Verbal Task Participants	Score 1	Score 2	Twenty Math Task Participants	Score 1	Score 2
Average Female Score	10.6	10.8	Average Female Score	9.5	9.6
Average Male Score	10.8	10.4	Average Male Score	9.5	9.8
Female Score Variance	13.6	10	Female Score Variance	18.5	17.2
Male Score Variance	13.5	10.7	Male Score Variance	14.7	14.8
Female Max Score	16	15	Female Max Score	15	15
Male Max Score	16	15	Male Max Score	15	15
Female Min Score	4	5	Female Min Score	3	4
Male Min Score	5	5	Male Min Score	4	4

The candidates were then asked to select five employees from the stack of 20 cards separately for the math and verbal tasks. They were given two performance scores for each candidate and told that the third score of their five selected employees would determine their earnings. Employers were thus incentivized to focus on the potential performance of the

candidates.[5] The profit-maximizing employer should use the performance information from the first two rounds (score 1 and score 2) and the other candidate information to select those five candidates that in expectation would have the highest round 3 performance score.

In each set of candidates, the top six scoring individuals (in each task) were three women and three men.[6] The top four scoring individuals were two men and two women, where each gender pair had the exact same scores. The two next-best candidates (one male and one female) in each group did not have the same exact scores, but had the same average scores in the two rounds: (13, 15) and (14, 14) in the math task, and (11, 15) and (13, 13) in the verbal task (i.e. one individual had a low variance, identical score set, and one individual had a high variance score set).[7] Since the employer had to choose five employees, and the first four best employees were "no-brainers", the unbiased, profit-maximizing employer's fifth decision was between those two remaining individuals, i.e. the fifth-place contenders. A risk averse employer would prefer the low variance fifth-choice contender. Accordingly, we varied whether that candidate was male or female.

To test for the impact of different norms in Stage 2 but still report Stage 1 outcomes truthfully, we aimed to enhance variation in the choices the Stage 1 employers made. Our goal was to observe at least one session where most Stage 1 employers chose a group of majority female employees and at least one session where most Stage 1 employers chose a group of majority male employees. We sought to do this without fundamentally changing the experimental design so that the identical design could be replicated in Stage 2. Thus, we varied the order in which employers were confronted with the two tasks, with the math task presented either before or after the verbal task in an experimental session.[8]

Stage 1 Experimental Procedures

We ran four sessions in Stage 1, two with the math task first and two with the verbal task first. They were conducted in the Harvard Decision Science Laboratory in Cambridge, MA with a total of 53 laboratory subjects. All of our participants (i.e. employers) remained anonymous throughout the study and were only identified by code numbers. For each task, employers were informed about the payoff structure and received an explanation of the task the employees had to perform, including viewing a sample of the task employees had performed. Subsequently, they were given the 20 cards (shuffled) to make their five selections for that task. After employers made their decisions, the twenty cards were collected, and the next task was presented (which included another set of 20 cards for that task). Once the hiring decisions were made for the two tasks, subjects participated in a lottery choice decision task to evaluate their risk preferences and answered a demographic questionnaire. At the end of the session, they were informed of their earnings and paid in cash (their earnings plus a $10 show-up fee). The experiment was computerized and programmed using Z-tree software program (Fischbacher, 2007), the instructions were read out loud and can be found in Appendix A.

Identifying Gender Norms

Table 2 displays the outcome of Stage 1-employers' hiring decisions. In session 1, when the math task was presented first, we observed slightly stereotype-contradicting hiring behavior with 62% of employers in the math task and 46% of employers in the verbal task selecting female majority employee groups. In contrast, when the verbal task was presented to the employers first (Session 2), we observed stereotypical hiring behavior with only 29% of

individuals choosing more female employees for the math task and 71% choosing more women for the verbal task. Sessions 3 and 4 did not yield any variation in hiring behavior, with most employers choosing female majority groups for both tasks.

Table 2
Stage 1 Hiring Norms, Percentage of Employers Hiring Female Majority Groups

	Session 1 Math First	Session 2 Verbal First	Session 3 Math First	Session 4 Verbal First
Math	61.5%	28.6%	69.2%	69.2%
Verbal	46.2%	71.4%	61.5%	61.5%
Total Subjects	13	14	13	13
Female Subjects (%)	53.8%	78.6%	53.8%	76.9%

Thus, the observed variation in Sessions 1 and 2 may well not be due to order effects. However, this does not matter for our purposes here. All we wanted to achieve was to observe some variation so that we could replicate these sessions in the next stage and truthfully report what the outcome (i.e. hiring norm) of a previous experimental session had been.

Stage 2: Testing the Impact of Norm Information on Hiring
To test the impact of descriptive norms on hiring, we replicated Sessions 1 and 2 with a new group of employers who made hiring decisions in Stage 2 using the same instructions and the same 20 candidates as the Stage 1-employers. The only difference in Stage 2 was that employers were informed of what Stage 1employers had done in their respective sessions. We ran two control conditions, one with math first and one with verbal first, where no information on the fraction of women and men hired was provided (i.e. "In a previous experimental session exactly like yours, people chose both women and men.").

We also examined the potential impact of framing on employee selection. In one frame of the norm, the male frame, the norm's focus is on the Stage 1-employers choosing more men and placing men in a position of gain (i.e. "In a previous experimental session exactly like yours, X% of the people chose more men than women."). In the other frame, the female frame, the focus is on the individuals who are choosing more women, placing women in a position of gain (i.e. "In a previous experimental session exactly like yours, (1 – X)% of the people chose more women than men.").

Hence, this part of the study consisted of two control conditions and four treatment conditions, summarized in Table 3 below.

Table 3
Descriptive Norm Information Used in Stage 2

Treatment	Frame	Task Order	Math Norm	Verbal Norm
			"In a previous experimental session like yours, …"	
Control 1	None	Math First	people chose both women and men	people chose both women and men
Control 2	None	Verbal First	people chose both women and men	people chose both women and men
Treatment 1	Female	Math First	62% of the people chose more women than men (FF)	46% of the people chose more women than men (MF)
Treatment 2	Female	Verbal First	29% of the people chose more women than men (MF)	71% of the people chose more women than men (FF)
Treatment 3	Male	Math First	38% of the people chose more men than women (FF)	54% of the people chose more men than women (MF)
Treatment 4	Male	Word First	71% of the people chose more men than women (MF)	29% of the people chose more men than women (FF)

Notes: FF = Female Favoring Norm; MF = Favoring Men Norm

Stage 2 Experimental Procedures

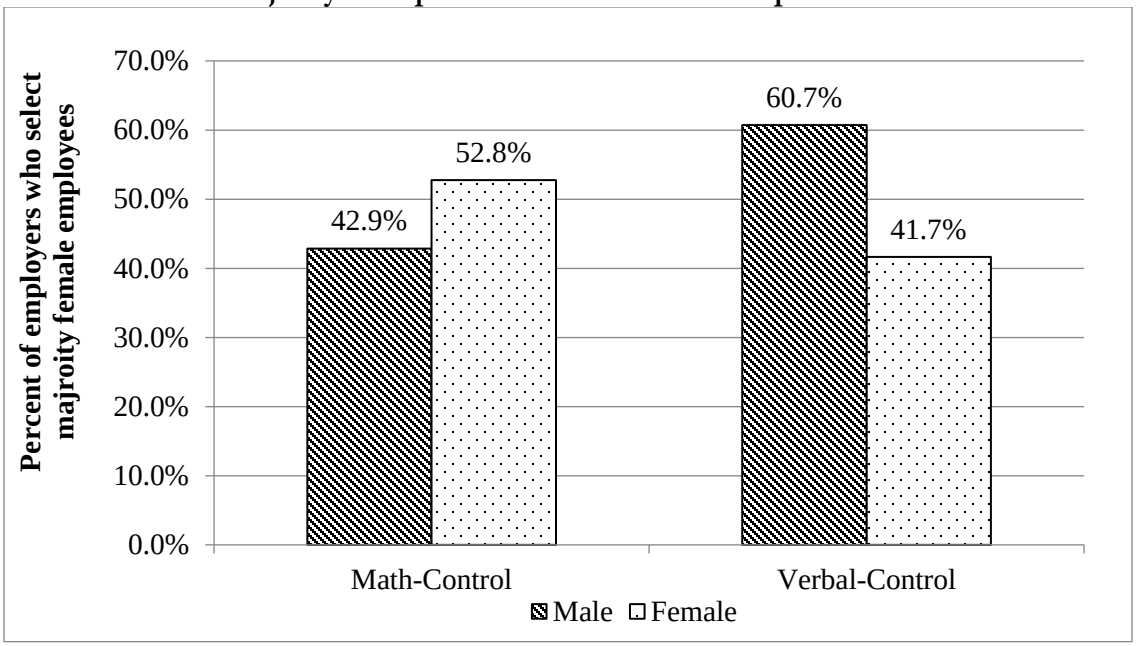
The experimental sessions for Stage 2 included 192 participants (i.e. employers) and were conducted in twenty-five sessions using the student subject pool at the Harvard Decision Science Laboratory in Cambridge, MA. The two control and four experimental treatment conditions employed equal proportions of female (18 out of 32 participants) and male participants (14 out of 32 participants), with a total of 108 female subjects and 84 male subjects. As in Stage 1, all Stage 2 participants remained anonymous throughout the study and were only identified with code numbers, the experiment was programmed using Z-tree (Fischbacher, 2007), the instructions were read out loud and can be found in Appendix B. Stage 2 results are discussed in the next section.

Results: The Effects of Descriptive Norm Information

In Stage 2 we studied the impact of descriptive norms on gender diversity in hiring decisions. First, we present our control treatment results with Figure 1 depicting employers' preferences where no information on previous employer choices was provided (Control conditions 1 and 2, N=64). The likelihood that male employers chose female majority employee groups was 42.9% in the math task and 60.7% in the verbal task. While directionally suggestive of stereotypical hiring, these differences are not significant compared

to an equal split (math task: z = -0.75, p = 0.45; verbal task: z = 1.13, p = 0.26). Among female employers, 52.8% chose female majority employee groups in the math task and 41.7% chose female majority employee groups in the verbal task; also not significant compared to an equal split (math task: z = 0.33, p = 0.74; verbal task: z = -1.00, p = 0.32). Therefore, neither male nor female employers showed significant stereotypical hiring tendencies and we found no evidence of gender specific discrimination in the control treatments.[9]

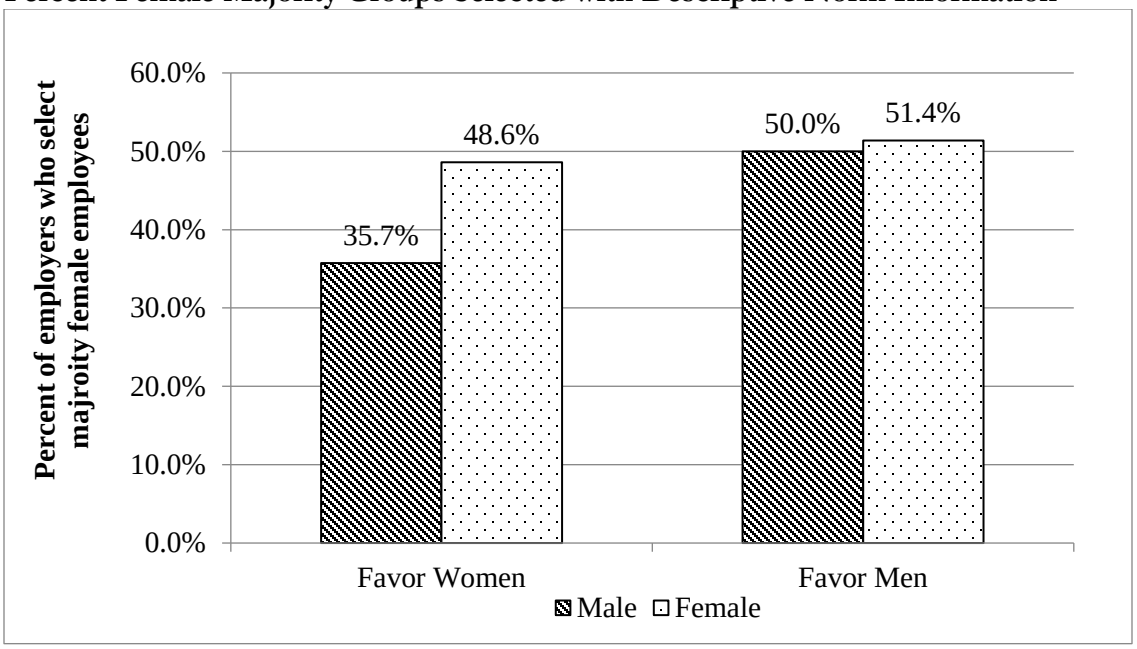
Figure 1
Percent Female Majority Groups Selected without Descriptive Norm Information



Next, we examine whether knowing what Stage 1-employers had done affected Stage 2-employer behavior in experimental treatment conditions 1-4. We do not find any evidence in support of descriptive norms having prescriptive effects: employers in Stage 2 were not more likely to choose an action when employers in Stage 1 had done so as well. In contrast, male employers were less likely to choose an action when others had done so in one particular instance: men showed reactance to norms that favored women.

Figure 2 presents our results. When Stage 2-employers learned that previous employers in Stage 1 had chosen mostly women, 35.7 percent of second-stage male employers chose female majority groups, which is significantly below an equal split (z = -2.14, p = 0.03). Specifically, compared to an equal split, when previous employers had favored women, the likelihood that men chose female majority groups was 39 percent in the math task (z = -1.16, p =0.24) and 32 percent in the verbal task (z = -1.90, p = 0.06).

Figure 2
Percent Female Majority Groups Selected with Descriptive Norm Information



However, male Stage 2 employers were not affected by norms that favored men. Exactly 50 percent of the employers chose female majority groups in both the math and the verbal task when they received norm information that favored men. Therefore, it is unlikely that the norm reactance by men is due to preferences for equality given that it is only observed when men are being disfavored by the norm information. Compared to the control condition, they chose somewhat less stereotypically but this difference is not significant.

In contrast, female Stage 2 employers were not influenced by descriptive norm information. When norm information favored women, the likelihood that women selected majority women employees was 50 percent in the math task and 47 percent in the verbal task. The likelihood that women chose majority women employee in norm conditions that favored men was 55 percent in the math task and 47 percent in the verbal task. None of these likelihoods significantly differ from an equal split.

Table 4 presents a regression analysis where we compare employers' choices in situations where the norm information favored women or men with our control treatments where no norm information was provided. Column 1 shows that Stage 2 male employers were significantly less likely to choose female majority groups when the information favored women as compared to treatments where no information on norms was provided. In fact, the average male employer was 20 percentage points more likely to select a group of mostly women when no norm information was provided than when the norm favored women ($p < 0.05$). Column 3 also shows that this effect is significant: male employers confronted with norms that favor women were the only individuals reacting to this information by choosing significantly fewer female majority groups than everyone else.

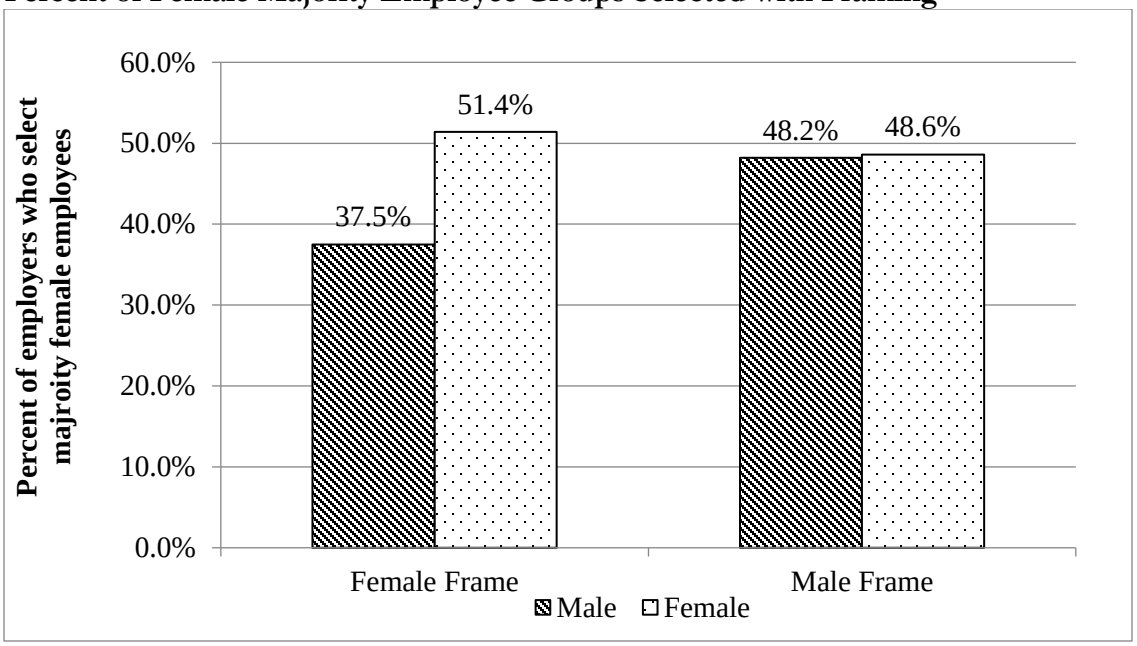
Table 4
The Effect of Descriptive Norm Information on the Percent of Female Majority Groups Selected, Marginal Effects at Mean

	(1)	(2)	(3)
	Male Subjects	Female Subjects	Male & Female Subjects
FemaleFavoringNorm	-0.197**	0.009	-0.073
	(0.093)	(0.087)	(0.064)
MaleFavoringNorm	-0.049	0.037	0.007
	(0.100)	(0.088)	(0.065)
Math	-0.034	0.077	0.027
	(0.078)	(0.069)	(0.051)
Male			-0.026
			(0.052)
FemaleFavoringNorm*Male			-0.140*
			(0.083)
MaleFavoringNorm*Male			-0.036
			(0.086)
Control Variables	YES	YES	YES
Observations	168	216	384
Psuedo-R2	0.042	0.030	0.019

Notes: Each specification in a Probit regression, controlling for order of which the tasks were presented, age, education, income, race, nationality, and risk tolerance (based on Holt and Laury (2002), measured by the number of risky choices). Marginal effects are reported in percentage points. The dependent variable is the selection of a female majority employee group. Standard errors are in parentheses. *** Significance at the 1 percent level. ** Significance at the 5 percent level. * Significance at the 10 percent level.

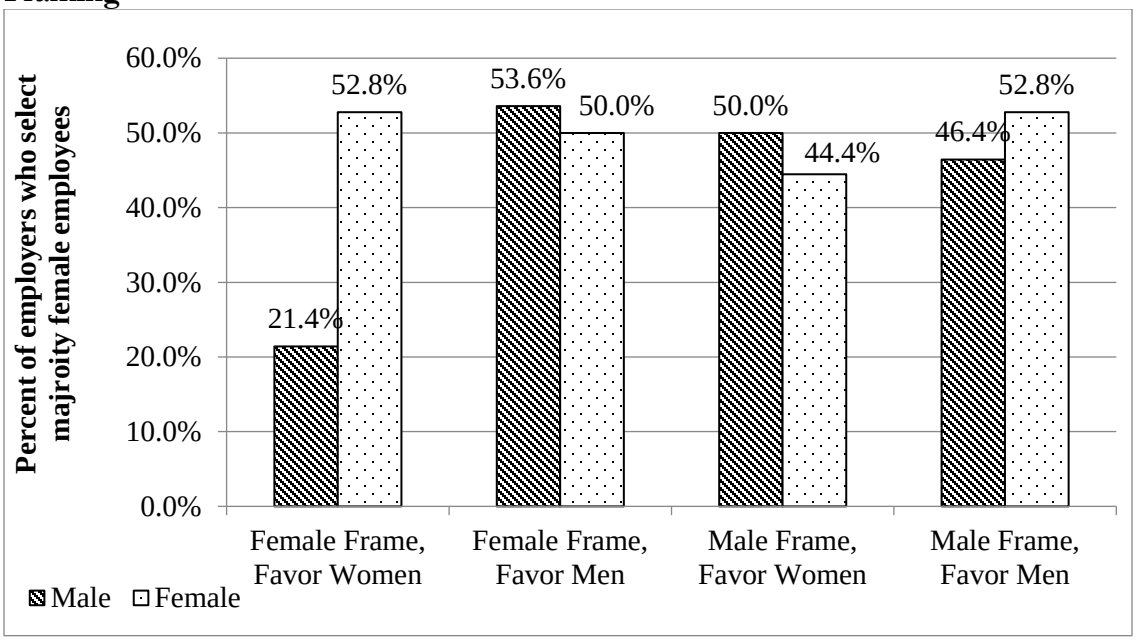
Therefore, our results do not support reactance based on concerns for equality nor reactance by the disfavored group, as women did not show any reactance to earlier employers favoring men. Rather, our results suggest that only the high-status group, men, showed reactance when confronted with earlier employers favoring the low-status group: women.

Figure 3
Percent of Female Majority Employee Groups Selected with Framing



Further analysis of our results provides insights into the mechanisms behind this male reactance. In our treatment conditions, the information on previous employers' choices was provided to study participants with different gender frames. The frame either focused on men being in the gain position as compared to women (i.e. the male frame) or women being in the gain position as compared to men (i.e. the female frame). While the gender frame of the norm information seems to have no effect on female employers (Figure 3), the results show that male employers were somewhat sensitive to the frame in which the norm information was expressed: men showed marginally significant reactance to norm information that focused on women being in a position of gain as compared to men.[10] When the norm information was presented with a female frame, 37.5 percent of male employers chose majority women employees ($z = -1.87$, $p = 0.06$). More specifically, when norm information was presented in a female frame, men chose majority women employees with 39.3 percent likelihood in the math task ($z = -1.13$, $p = 0.26$) and 35.7 percent in the verbal task ($z = -1.51$, $p = 0.13$. When the male frame was used, this effect disappeared and male employers were equally likely to choose men and women in the math and the verbal tasks.

Figure 4
Percent Female Majority Groups Selected with Descriptive Norm Information and Framing



Moreover, when descriptive norms favored women and were described using a female frame, male employers exhibited particularly pronounced reactance (Figure 4). In this case (e.g. "71% chose more women than men"), only 21 percent of the male employers chose female majority groups, which is significantly below an equal split ($z = -2.17$, $p = 0.03$). This also significantly differs from the same descriptive norm information being provided with a male frame (namely, that "29% chose more men than women"), where 50 percent of the male employers chose female majority employee groups.

Table 5
The Effect of Descriptive Norm Information & Framing on the Percent of Female Majority Groups Selected, Marginal Effects at Mean

	(1)	(2)	(3)
	Male Subjects	Female Subjects	Male & Female Subjects
FemaleFavoringNorm	-0.180*	-0.019	-0.070
	(0.109)	(0.100)	(0.074)
MaleFavoringNorm	-0.085	0.028	-0.002
	(0.124)	(0.109)	(0.080)
Math	-0.035	0.077	0.027
	(0.079)	(0.069)	(0.052)
Male			-0.002
			(0.054)
FemaleFavoringNorm*Male			-0.108
			(0.094)
MaleFavoringNorm*Male			-0.030
			(0.100)
FemaleFrame	-0.053	0.049	-0.016
	(0.107)	(0.095)	(0.069)
FemaleFrame*FemaleFavoringNorm	-0.326***	0.067	-0.121
	(0.094)	(0.106)	(0.077)
FemaleFrame*Male			-0.038
			(0.094)
FemaleFrame*FemaleFavoringNorm*Male			-0.294***
			(0.091)
Control Variables	YES	YES	YES
Observations	168	216	384
Psuedo-R2	0.0652	0.0329	0.0309

Notes: Each specification in a Probit regression, controlling for order of which the tasks were presented, age, education, income, race, nationality, and risk tolerance (based on Holt and Laury (2002), measured by the number of risky choices). Marginal effects are reported in percentage points. The dependent variable is the selection of a female majority employee group. Standard errors are in parentheses. *** Significance at the 1 percent level. ** Significance at the 5 percent level. * Significance at the 10 percent level.

Table 5 presents a regression analysis that confirms these results, with both control conditions as our baseline comparison. Column (1) shows that male employers were 33 percentage points less likely to choose female majority groups when exposed to a female favoring norm with a female frame as compared to treatments with no norm and frame. This effect is highly significant. In addition, in column (3) we observe the average male employer is 29 percentage points less likely to hire female majority groups than the average female employer when provided with norm information that favors women and places women in the position of gain by using a female frame ($p < 0.01$).

Reviewing our results, we find that descriptive norms do not lead to prescriptive norm-abiding behaviors in the gender domain studied here. Female employers were not affected by norm information or presentation. Male employers exhibited a pronounced reactance to norms that favored women while they were not affected by norm information that favored men. Their reactance was particularly pronounced when the norm information, favoring women, was presented in a female frame, which highlighted women's gains.

Discussion and Conclusion

Our research examines the impact of descriptive norm information on gender diversity by studying whether employers are more likely to hire more of one gender for a stereotypically male or female task when informed that others have done so as well. When we do not invoke any descriptive social norms and provide no information on what other employers have done, neither male nor female employers showed significant stereotypical hiring tendencies (even though directionally, male employers tended to choose employees stereotypically).

However, when describing what others have done, male employers tended to "correct" for others having chosen more women than men: they chose more male employees when others had chosen more women across the two tasks. However, male employers were not affected when others had chosen more men and did not "correct" for the prior behavior of others who had favored men.

In contrast, female employers appear hardly affected by the norm information at all. Instead, on average, they chose about 50 percent women and men independent of the task, norm and frame. Therefore, descriptive social norms did not have prescriptive effects as they do in other contexts. They did not affect women and led to reactance among men, with male employers choosing more men when others had chosen more women. Instead, our results suggest that men, the traditionally high-status group, react to others' behaviors threatening the representation and status of their gender group. As only men showed this behavior, and only when descriptive norms favored women rather than men, we can exclude generic concerns about equality as a motivator of behavior. Additionally, men's reactance was particularly pronounced when the norm information was presented to remind them of women's gains, further suggesting reactance being due to perceived intergroup threat by the high-status group.

To what extent we find such norm reactance to female-favoring norm information from men in the field is an open question. When using descriptive norms as a nudge, it appears as if the UK has been successful in promoting more gender diversity on corporate boards by invoking the norm that most other boards were gender diverse. However, given that many different changes were introduced at the same time, we do not know what the impact of this particular change was. It might as well have been neutral or even negative, compensated for by other interventions such as, naming and shaming of non-compliant companies by the media.

At the same time, reactance against women has been found in other situations where women appear to be favored. For example, Dezso, Ross, and Uribe (2016) found that once a

company hires a woman to a top-tier job, the probability of a second woman to land a top position at the same firm drops by about 50 percent – though, companies with female CEOs did slightly better in this regard. Gender quotas that favor women in the field, while obviously more forceful than a descriptive norm nudge, have also been reported to yield reactance (Beaman et al., 2009). Moreover, Leibbrandt, Wang, and Foo (2015) found in a laboratory experiment that subjects who have been favored by a quota experience backlash from coworkers.

Our experiments differ in some important respects from these interventions. First, we use a norm nudge that does not impose any policy mandates such as a quota system. In addition, and perhaps most notably, we did not start out with employers having very gender biased preferences in the control conditions. Thus, there was little to 'correct' to start with. In contrast, the fractions of female leaders and male elementary school teachers rarely surpass 20 percent. By studying female majority (and male majority) groups, we might have created more male reactance than what we would have observed if the fraction of women was increased from, say about 10 to 26 percent, as was successfully done for corporate boards in the UK.

Maybe, gender diversity is acceptable to men up to a point? Additional research will have to tell. Based on our results, we conclude that women do not appear to be influenced by gender diversity norms at all, neither are men when the norm information prescribes hiring majority male groups. However, men seem uncomfortable with following norms that suggest hiring female majority groups—they react against them.

Notes

1. See also Perkins, Haines, & Rice, 2005; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007; Wechsler et al., 2003; Werch et al., 2000.
2. See Bohnet et al (2016) for a discussion on the stereotypical perception of both tasks.
3. The incentivized math task they performed consisted of adding as many rows of five two-digit numbers and the incentivized word task involved finding words in a matrix during a given time period. The participants performed each task at least three times.
4. We made sure that the profiles of the two fifth best candidates were identical in all these additional characteristics so that 'employers' could base their decision between those two candidates only on the performance scores and gender.
5. For example, in the math task, if the five chosen employees added up 50 rows of numbers correctly in the third round, they would score a total of 50 points and the employer would receive $10 (50 x $0.20).
6. Besides gender and performance scores all attributes of the top six performing candidates were identical.
7. The scores were not presented in any particular sequence and this was mentioned to the study participants. The scores presented are two of the three performance round scores, not the first two of three performance round scores. Therefore, the high variance profiles would not necessarily suggest learning.
8. We had no view on how order would affect behavior, other than possibly creating variation in at least some of the sessions.

9. Men were no more likely to stereotypically choose female majority 'employee' groups in the verbal task than women (t-test yields $p = 0.13$), and there was an insignificant gender difference in 'employee' selection for the math task ($p = 0.44$).
10. When female frame is used, the likelihood that women select female majority employee groups was 52.8 percent in the math task and 50 percent in the verbal task. When the male frame is used, the likelihood that women select female majority employee groups was 52.8 percent in the math task and 44.4 percent in the verbal task. None of these likelihoods significantly differ from an equal split.

References

Adler, A. ([1910] 1956). Inferiority Feeling and Masculine Protest. In H. L. Ansbacher & R. R. Ansbacher (Eds.), *The Individual Psychology of Alfred Adler: A Systematic Presentation in Selections from His Writings* (pp. 45-52). New York: Basic Books.

Ahern, K. R., & Dittmar, A. K. (2012). The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation. *The Quarterly Journal of Economics, 127*(1), 137-197.

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics, 95*(9), 1082-1095.

Allcott, H., & Rogers, T. (2012). *The Short-run and Long-run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation*. Working Paper. NBER.

Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R., & Topalova, P. (2009). Powerful Women: Does Exposure Reduce Bias? *The Quarterly Journal of Economics, 142*(4), 1497-1540.

Beshears, J., Choi, J. J., Laibson, D., Madrian, B. C., & Milkman, K. L. (2011). *The Effect of Providing Peer Information on Retirement Savings Decisions*. Working Paper. NBER.

Bohnet, I. (2016). *What Works: Gender Equality by Design*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.

Bohnet, I., van Geen, A., & Bazerman, M. (2016). When Performance Trumps Gender Bias: Joint Versus Separate Evaluation. *Management Science, 62*(5), 1225–1234.

Carrell, S. E., Sacerdote, B. I., & West, J. E. (2011). *From Natural Variation to Optimal Policy? The Lucas Critique Meets Peer Effects*. Working Paper. NBER.

Catalyst Research. (2014a). Fortune 500 CEO Positions Held By Women. 2014, from http://www.catalyst.org/knowledge/fortune-500-ceo-positions-held-women

Catalyst Research. (2014b). Women On Boards. 2014, from http://www.catalyst.org/knowledge/women-boards

Chattopadhyay, R., & Duflo, E. (2004). Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica, 72*(5), 1409-1443.

Cialdini, R. B. (2003). Crafting Normative Messages to Protect the Environment. *Current Directions in Psychological Science, 12*(4), 105-109.

Cialdini, R. B., Demaine, L. J., Sagarin, B. J., Barrett, D. W., Rhoads, K., & Winter, P. L. (2006). Managing social norms for persuasive impact. *Social Influence, 1*(1), 3-15.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places. *J Pers Soc Psychol, 58*(6), 1015–1026.

Coffman, L. C., Featherstone, C. R., & Kessle, J. B. (2014). *Can Subtle Provision of Social Information Affect What Job You Choose and Keep?* Working Paper.

Costa, D. L., & Kahn, M. E. (2013). Energy Conservation "Nudges" and Environmentalist Ideology: Evidence from a Randomized Residential Electricity Field Experiment. *Journal of the European Economic Association, 11*(3), 680–702.

Croson, R., & Shang, J. (2008). The impact of downward social information on contribution decisions. *Experimental Economics, 11*(3), 221-233. doi: 10.1007/s10683-007-9191-z

Curtis, J. W., & Thornton, S. (2013-2014). Losing Focus: The Annual Report on the Economic Status of the Profession *Annual Report*: American Association of University Professors.

Davies, L. (2011). Women on Boards *Davies Report*. UK: Department for Business, Innovation & Skills.

Davies, L. (2014). Women on Boards *Davies Review Annual Report*. UK: Department for Business, Innovation & Skills.

Davies, L. (2015). Women on Boards: Five Year Summary (Davies Review) *Davies Report*. UK: Department for Business, Innovation & Skills.

Dezso, C. L., Ross, D. G., & Uribe, J. (2016). Is there an implicit quota on women in top management? A large-sample statistical analysis. *Strategic Management Journal, 37*(1), 98-115.

Eibach, R. P., & Keegan, T. (2006). Free at last? Social dominance, loss aversion, and white and black Americans' differing assessments of racial progress. *J Pers Soc Psychol, 90*(3), 453-467.

Fischbacher, U. (2007). z-Tree: Zurich Toolbox for Ready-made Economic Experiments. *Experimental Economics, 10*(2), 171-178.

Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A Model of (Often Mixed) Stereotype Content: Competence and Warmth Respectively Follow From Perceived Status and Competition. *J Pers Soc Psychol, 82*(6), 878–902.

Frey, B. S., & Meier, S. (2004). Social Comparisons and Pro-Social Behavior: Testing "Conditional Cooperation" in a Field Experiment. *The American Economic Review, 94*(5), 1717-1722.

Gerber, A. S., & Rogers, T. (2009). Descriptive Social Norms and Motivation to Vote: Everybody's Voting and so Should You. *The Journal of Politics, 71*(01), 178.

Goldring, R., Gray, L., & Bitterman, A. (2013). Characteristics of Public and Private Elementary and Secondary School Teachers in the United States: Results From the 2011–12 Schools and Staffing Survey (NCES 2013-314). Washington, DC: National Center for Education Statistics.

Goldstein, Noah J., Cialdini, Robert B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research, 35*(3), 472-482.

Handley, I. M., Brown, E. R., Moss-Racusin, C. A., & Smith, J. L. (2015). Quality of evidence revealing subtle gender biases in science is in the eye of the beholder. *Proceedings of the National Academy of Sciences, 112*(43), 13201–13206.

Holt, C. A., & Laury, S. K. (2002). Risk Aversion and Incentive Effects. *American Economic Review, 92*(5), 1644-1655.

Hong, K., & Bohnet, I. (2007). Status and distrust: The relevance of inequality and betrayal aversion. *Journal of Economic Psychology, 28*(2), 197-213.

Inter-Parliamentary Union. (2016). *Women in national parliaments, as of January 1, 2016*.

Jetten, J., Spears, R., & Postmes, T. (2004). Intergroup Distinctiveness and Differentiation: A Meta-Analytic Integration. *J Pers Soc Psychol, 86*(6), 862-879.

Koenig, M. A., Ahmed, S., Hossain, M. B., & Mozumder, A. B. M. K. A. (2003). Women's Status and Domestic Violence in Rural Bangladesh: Individual- and Community-level Effects. *Demography, 40*(2), 269–288.

Krook, M. L. (2009). *Quotas for Women in Politics: Gender and Candidate Selection Reform Worldwide*. New York: Oxford University Press.

Leibbrandt, A., Wang, L. C., & Foo, C. (2015). *Gender Quotas, Competitions, and Peer Review: Experimental Evidence on the Backlash Against Women*. CESIFO Working Paper Series. CESifo Group Munich.

Luke, N., & Munshi, K. (2011). Women as agents of change: Female income and mobility in India. *Journal of Development Economics, 94*(1), 1-17.

Martin, R., & Randal, J. (2008). How is donation behaviour affected by the donations of others? *Journal of Economic Behavior & Organization, 67*, 228–238.

Perkins, H. W., Haines, M. P., & Rice, R. (2005). Misperceiving the College Drinking Norm and Related Problems: A Nationwide Study of Exposure to Prevention Information, Perceived Norms and Student Alcohol Misuse. *Journal of Studies on Alcohol, 66*(4).

Roccas, S., & Schwartz, S. H. (1993). Effects of intergroup similarity on intergroup relations. *European Journal of Social Psychology, 23*(6), 581–595.

Rudman, L. A., & Goodwin, S. A. (2004). Gender Differences in Automatic In-Group Bias: Why Do Women Like Women More Than Men Like Men? *J Pers Soc Psychol, 87*(4), 494-509.

Rutgers University. (2016). History of Women in the U.S. Congress. Retrieved 2016, from http://www.cawp.rutgers.edu/history-women-us-congress

Schmader, T. (2002). Group Identification Moderates Stereotype Threat Effects on Women's Math Performance. *Journal of Experimental Social Psychology, 38*, 194-201.

Schmitt, M. T., Lehmiller, J. J., & Walsh, A. L. (2007). The Role of Heterosexual Identity Threat in Differential Support for Same-Sex `Civil Unions' versus `Marriages'. *Group Processes & Intergroup Relations, 10*(4), 443-455.

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. *Psychological Science, 18*(5), 429-434.

Sidanius, J., & Pratto, F. (1999). *Social Dominance: An Intergroup Theory of Social Hierarchy and Oppression*. Cambridge, United Kingdom: Cambridge University Press.

Spoor, J. R., & Schmitt, M. T. (2011). "Things Are Getting Better" Isn't Always Better: Considering Women's Progress Affects Perceptions of and Reactions to Contemporary Gender Inequality. *Basic and Applied Social Psychology, 33*(1), 24-36.

Stout, J. G., Dasgupta, N., Hunsinger, M., & McManus, M. A. (2011). STEMing the tide: Using ingroup experts to inoculate women's self-concept in science, technology, engineering, and mathematics (STEM). *J Pers Soc Psychol, 100*(2), 255-270.

Tajfel, H. (1982). Social Psychology of Intergroup Relations. *Annual Review of Psychology, 33*, 1-39.

Tajfel, H., & Turner, J. C. (1986). The Social Identity Theory of Intergroup Behavior. In J. T. Jost & J. Sidanius (Eds.), *Political psychology: Key readings in social psychology* (pp. 276-293). New York, NY, US: Psychology Press.

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness*: Yale University Press.

Treating the fair sex fairly. (August 9, 2014). *The Economist*.

UK Government. (2011). Women on Boards. Retrieved May 2015, from https://www.gov.uk/government/news/women-on-boards

UK Government. (2013). Women on Boards: two years on. Retrieved May 2015, from https:// www.gov.uk/government/news/women-on-boards-two-years-on

UN Women. (2015). Women's leadership and political participation. Retrieved May 2015, from http://www.unwomen.org/en/what-we-do/leadership-and-political-participation

Van Vugt, M., De Cremer, D., & Janssen, D. P. (2007). Gender Differences in Cooperation and Competition: The Male-Warrior Hypothesis. *Psychological Science, 18*(1), 19-23.

Wechsler, H., Nelson, T. F., Lee, J. E., Seibring, M., Lewis, C., & Keeling, R. P. (2003). Perception and Reality: A National Evaluation of Social Norms Marketing Interventions to Reduce College Students' Heavy Alcohol Use. *Journal of Studies on Alcohol, 64*, 484-494.

Werch, C. E., Pappas, D. M., Carlson, J. M., DiClemente, C. C., Chally, P. S., & Sinder, J. A. (2000). Results of a Social Norm Intervention to Prevent Binge Drinking Among First-year Residential College Students. *Journal of American College Health, 49*(2), 85-92.

Willer, R., Rogalin, C. L., Conlon, B., & Wojnowicz, M. T. (2013). Overdoing Gender: A Test of the Masculine Overcompensation Thesis. *American Journal of Sociology, 118*(4), 980-1022.

Appendix

Appendix A. Stage 1 Instructions, For Stage 1 Employers

Treatment Codes	
Treatments	Code
Math first Treatments	M
Order 1	M1
Order 2	M2
Verbal first Treatments	V
Order 1	V1
Order 2	V2

<<Italics are notes to the reader/ experimenter>>
<<Bold is treatment specific>>

<<When subjects come into the waiting room they are asked to sign a consent form. They are informed that they are free to withdraw from the study at any time but that if they withdraw they will only receive the show up fee >>>

WELCOME!

Before we start with the experiment we will be reading the instructions out loud. If at any time you have any questions or concerns, please press the "assistance" button below your screen and someone will come by and assist you.

You are participating in a study in which you will earn some money. The amount will depend on your decisions. At the end of the study, your earnings will be added to a show-up fee, and you will be paid in cash. You will remain anonymous throughout this study and there will be no way for the experimenter to relate your answers to your name. You will only be identified by the number that is on the yellow post-it in your cubicle.

During this study you are not allowed to talk to other participants, browse the Internet, make use of your mobile phone or consult any other personal materials. Please make sure your phone is set to silent and tucked away.

Please remain seated during the experiment until the experimenters tell you that it is ok to leave.

If there are no questions, we will now begin with the experiment.

Your Choice. --

Another group of study participants has participated in a study conducted by us earlier at Harvard Decision Science Lab (HDSL). They have been paid based on their performance. They had to solve as many problems as they could in a given time period, and this task was performed at least three times. We will explain the task to you below. Then, you will receive two of three performance scores for 20 of these participants. Finally you will be asked to select 5 of the 20 participants, where the third score on the task of your selected five candidates will determine your earnings.

You will now receive information on the task. In addition, you will be informed on the participants' characteristics and two of their performance scores.

Information on Task.

<<M1, M2 or V1, V2>>

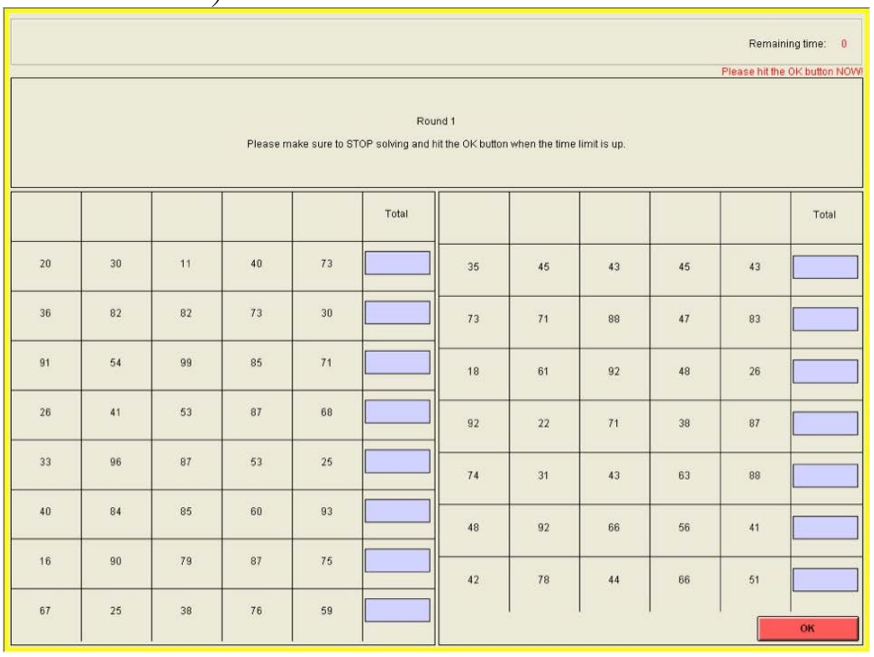
Participants in a previous study engaged in a number adding task. They were shown a table with rows of five two-digit numbers. The participants were asked and incentivized to add up as many rows of numbers as possible. This task was repeated several times, and each time, they had five minutes available.

While the task was otherwise identical, they saw different rows of numbers each time.

Their point score was calculated as follows:
- For every correctly added row of numbers, one point was added to their score.
- Rows of numbers that were not correctly added up received no points.

To have a better understanding of the task, please click on this button to see a sample task. (You will see the task for 30 seconds and not for the 5 minutes the participants did.)

(SAMPLE TASK)



/
<< V1, V2, or M1, M2 >>

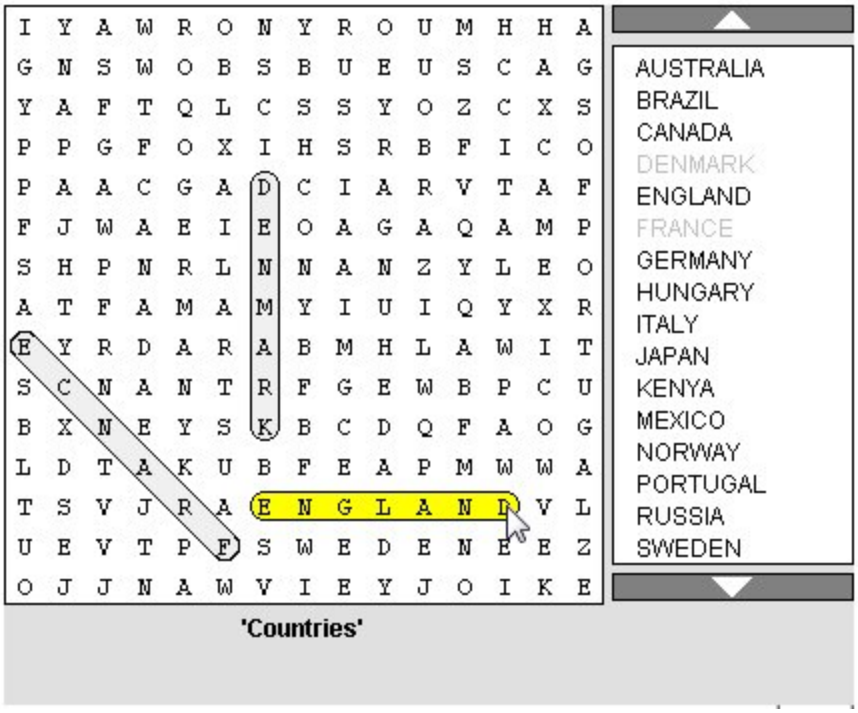
Participants in a previous study engaged in a word finding task. They were shown a matrix containing letters. Some letters appeared in random order and some formed words by combining letters next to each other horizontally, vertically or diagonally. A list of all words contained in a given matrix was displayed next to the matrix. The participants were asked and incentivized to find as many words from the list as possible. This task was repeated several times, and each time, they had three minutes available.

While the task was otherwise identical, they saw different matrices containing different letters and words each time.

Their point score was calculated as follows:
- For every correct word marked in the matrix, one point was added to their score.
- Words that were not marked correctly received no points.

To have a better understanding of the task, please click on this button to see a sample task. (You will see the task for 30 seconds and not for the 3 minutes the participants did.)

(INCLUDE MATRIX AND SHOW FOR 30 SECONDS)



Procedure to determine your earnings:

<<Math>>
Once you have chosen your five individuals, we will calculate your earnings, which are based on the total point score of your selected individuals. You will receive $0.20 for each point in your selected candidates' third scores. For example, if your five chosen candidates added up

50 rows of numbers correctly, they would score a total of 50 points and you would receive $10 (50x$0.20). We will inform you of the five chosen persons' total scores and your earnings at the end of this experiment.

<<Verbal>>
Once you have chosen your five individuals, we will calculate your earnings, which are based on the total point score of your selected individuals. You will receive $0.20 for each point in your selected candidates' third scores. For example, if your five chosen candidates found 50 words correctly, they would score a total of 50 points and you would receive $10 (50x$0.20). We will inform you of the five chosen persons' total scores and your earnings at the end of this experiment.

Information on Participants:
You will now be informed about the characteristics of 20 study participants who performed the task you just saw. This information is on the 20 cards that you are receiving from the experimenters. Each card represents a profile of one of the 20 participants, including participant number, demographic characteristics, and two of three performance scores. The cards are in random order. Your task is to select five of these individuals. You will be paid based on their third performance score. Note that you can select each participant only once.
<<All>>
If you have any questions, please press the "assistance" button now. Once we have addressed all questions, we will move to the main question of this study:
Main question: Select five people out of the 20 profiles you were presented. Their total third score on the task will determine your earnings.
Please remove the cards of the five selected people from the pile.

PLEASE PRESS OK ONLY AFTER YOU RECEIVED THE 20 CARDS.
<<Experimenter hands out 20 cards to each subject; content of cards is described below. >>

Math Task Candidates
<<M1>>

	Math Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Male	Male	Female	Female	Female
Performance score 1	8	15	15	4	15
Performance Score 2	8	15	14	4	15
Race	White	White	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Male	Female	Female	Male

Performance score 1	10	9	8	14	5
Performance Score 2	11	9	7	14	4
Race	Asian	Asian	Black	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 11	Participant 12	Participant 13	Participant 14	Participant 15
Gender	Male	Male	Male	Female	Male
Performance score 1	15	10	9	8	13
Performance Score 2	14	10	9	7	15
Race	White	Black	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 16	Participant 17	Participant 18	Participant 19	Participant 20
Gender	Female	Female	Male	Male	Female
Performance score 1	11	7	4	7	3
Performance Score 2	12	8	5	9	4
Race	White	Black	Black	Asian	Asian
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

<<*M2*>>

	Math Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Male	Male	Female	Female	Female
Performance score 1	8	15	15	4	15
Performance Score 2	8	15	14	4	15
Race	White	White	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Male	Female	Male	Male
Performance score 1	10	9	8	14	5
Performance Score 2	11	9	7	14	4
Race	Asian	Asian	Black	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 11	Participant 12	Participant 13	Participant 14	Participant 15
Gender	Male	Male	Male	Female	Female
Performance score 1	15	10	9	8	13
Performance Score 2	14	10	9	7	15
Race	White	Black	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 16	Participant 17	Participant 18	Participant 19	Participant 20
Gender	Female	Female	Male	Male	Female
Performance score 1	11	7	4	7	3
Performance Score 2	12	8	5	9	4
Race	White	Black	Black	Asian	Asian
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

Verbal Task candidates

<<V1>>

	Word Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Female	Female	Female	Male	Male
Performance score 1	6	11	11	13	8
Performance Score 2	9	13	15	12	8
Race	Hispanic	Black	White	White	Black

Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Female	Female	Male	Male
Performance score 1	9	13	11	5	12
Performance Score 2	11	9	11	5	11
Race	White	Asian	Asian	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 11	Participant 12	Participant 13	Participant 14	Participant 15
Gender	Female	Female	Male	Male	Male
Performance score 1	16	4	16	10	10
Performance Score 2	15	5	15	9	13
Race	White	Black	White	Hispanic	Asian
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 16	Participant 17	Participant 18	Participant 19	Participant 20
Gender	Female	Female	Male	Male	Male
Performance score 1	15	10	15	13	6
Performance Score 2	12	8	12	13	6
Race	White	Asian	White	White	White
Nationality	American	Other	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

<<V2>>

	Word Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Female	Female	Male	Male	Male
Performance score 1	6	11	11	13	8
Performance Score 2	9	13	15	12	8

Race	Hispanic	Black	White	White	Black
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Female	Female	Male	Male
Performance score 1	9	13	11	5	12
Performance Score 2	11	9	11	5	11
Race	White	Asian	Asian	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 11	Participant 12	Participant 13	Participant 14	Participant 15
Gender	Female	Female	Male	Male	Male
Performance score 1	16	4	16	10	10
Performance Score 2	15	5	15	9	13
Race	White	Black	White	Hispanic	Asian
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 16	Participant 17	Participant 18	Participant 19	Participant 20
Gender	Female	Female	Male	Female	Male
Performance score 1	15	10	15	13	6
Performance Score 2	12	8	12	13	6
Race	White	Asian	White	White	White
Nationality	American	Other	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

<<Math>>
Please enter the participant numbers of your five selected profiles for the number adding task, ranking people, such that the 1st person is your top choice, and the 5th is the least preferred choice.

<<Verbal>>

Please enter the participant numbers of your five selected profiles for the word finding task, ranking people, such that the 1st person is your top choice, and the 5th is the least preferred choice.

<<Table as before>>

LOTTERY CHOICE DECISION TASK

We will now present you with a list of lottery questions. You will have two options to choose from: option A and option B. You will have 10 decisions to make.
Once you are done the computer will randomly select 1 of the 10 rows. Then the computer will execute the lottery described in the cell that you have selected in that row and display the lottery outcome. The computer program will pay out the lottery outcome with a 10% probability. That is, one out of 10 people receive the payoffs of the selected lottery in this task as additional earnings.

	Option A	**Option B**
1	Probability 1/10 to get $12 and probability 9/10 to get $9.6.	Probability 1/10 to get $23.1 and probability 9/10 to get $0.60.
2	Probability 2/10 to get $12 and probability 8/10 to get $9.6.	Probability 2/10 to get $23.1 and probability 8/10 to get $0.60.
3	Probability 3/10 to get $12 and probability 7/10 to get $9.6.	Probability 3/10 to get $23.1 and probability 7/10 to get $0.60.
4	Probability 4/10 to get $12 and probability 6/10 to get $9.6.	Probability 4/10 to get $23.1 and probability 6/10 to get $0.60.
5	Probability 5/10 to get $12 and probability 5/10 to get $9.6.	Probability 5/10 to get $23.1 and probability 5/10 to get $0.60.
6	Probability 6/10 to get $12 and probability 4/10 to get $9.6.	Probability 6/10 to get $23.1 and probability 4/10 to get $0.60.
7	Probability 7/10 to get $12 and probability 3/10 to get $9.6.	Probability 7/10 to get $23.1 and probability 3/10 to get $0.60.
8	Probability 8/10 to get $12 and probability 2/10 to get $9.6.	Probability 8/10 to get $23.1 and probability 2/10 to get $0.60.
9	Probability 9/10 to get $12 and probability 1/10 to get $9.6.	Probability 9/10 to get $23.1 and probability 1/10 to get $0.60.
10	Probability 10/10 to get $12 and probability 0/10 to get $9.6.	Probability 10/10 to get $23.1 and probability 0/10 to get $0.60.
11	Probability 10/10 to get $12 and probability 0/10 to get $9.6.	Probability 9/10 to get $23.1 and probability 1/10 to get $0.60.
12	Probability 10/10 to get $12 and probability 0/10 to get $9.6.	Probability 8/10 to get $23.1 and probability 2/10 to get $0.60.
13	Probability 10/10 to get $10 and probability 0/10 to get $8.	Probability 7/10 to get $23.1 and probability 3/10 to get $0.60.
14	Probability 10/10 to get $10 and probability 0/10 to get $8.	Probability 6/10 to get $23.1 and probability 4/10 to get $0.60.
15	Probability 10/10 to get $10 and probability 0/10 to get $8.	Probability 5/10 to get $23.1 and probability 5/10 to get $0.60.

<<*Payoffs lottery task*>>
The selected row in the lottery task was <<:D>>
The outcome of the lottery is; <<E>>
Your payoffs are: << F>>>

<<TOTAL PAYOFFS>>
Your total payoffs in this experiment are: <<A+Y+F>>

<<WE NOW CONTINUE WITH THE QUESTIONNAIRE>>
We now continue with a questionnaire while we are preparing your earnings from the experiment. This will take us at least 15 minutes, so please take your time.

1. Gender (male/female)
2. Age ()
3. Nationality (North-American/South-American/European or Australian or Russian/African/Asian/Middle Eastern)
4. Race (White/Black/Hispanic/Asian/other)
5. School (Harvard/ MIT/Other/Not a student)
6. Field of study (social science/ economics / science / humanities/ NA)
7. Current Program (College/Masters/PhD/other/NA)
8. GPA at college ()
9. SAT scores (Writing/Mathematics/Critical Reading)
10. Parental income (median household income is 4500) below median, at around median, above median)
11. What do you expect *your* annual household income in 10 years to be?
12. Parental education (N.A./ high school/ some college/ college/ PhD)
13. On a scale from 1 to 6, where 1 is not risk averse and 6 is extremely risk averse, how risk averse do you consider yourself?
14. On a scale from 1 to 6, where 1 is not loss averse and 6 is extremely loss averse, how loss averse do you consider yourself?
15. Do you feel happy/unsatisfied/angry/normal/sad/upset/bored/tired/energetic/excited
16. Any comments?

Thank you for your participation. Please remain seated if you are done, until we tell you it is ok for you to leave.

<<*Experimenters hand out receipts for them to sign, once these are signed, they receive an envelope with their earnings, and subjects can leave.*>>

Appendix B. Stage 2 Instructions, For Stage 2 Employers

Treatment Codes	
Treatments	Code
Treat 1 – Math First	T1
Norm Message	T1N
Control	T1C
Treat 2 – Verbal First	T2

Norm Message	T2N
Control	T2C

<<Italics are notes to the reader/ experimenter>>
<<Bold is treatment specific>>

<<When subjects come into the waiting room they are asked to sign a consent form. They are informed that they are free to withdraw from the study at any time but that if they withdraw they will only receive the show up fee >>>

WELCOME!

Before we start with the experiment we will be reading the instructions out loud. If at any time you have any questions or concerns, please press the "assistance" button below your screen and someone will come by and assist you.

You are participating in a study in which you will earn some money. The amount will depend on your decisions. At the end of the study, your earnings will be added to a show-up fee, and you will be paid in cash. You will remain anonymous throughout this study and there will be no way for the experimenter to relate your answers to your name. You will only be identified by the number that is on the yellow post-it in your cubicle.

During this study you are not allowed to talk to other participants, browse the Internet, make use of your mobile phone or consult any other personal materials. Please make sure your phone is set to silent and tucked away.

Please remain seated during the experiment until the experimenters tell you that it is ok to leave.

If there are no questions, we will now begin with the experiment.

Your Choice. --

Another group of study participants has participated in a study conducted by us earlier at Harvard Decision Science Lab (HDSL). They have been paid based on their performance. They had to solve as many problems as they could in a given time period, and this task was performed at least three times. We will explain the task to you below. Then, you will receive two of three performance scores for 20 of these participants. Finally you will be asked to select 5 of the 20 participants, where the third score on the task of your selected five candidates will determine your earnings.

You will now receive information on the task. In addition, you will be informed on the participants' characteristics and two of their performance scores.

Information on Task.

<<(T1N, T1C or T2N, T2C)>>

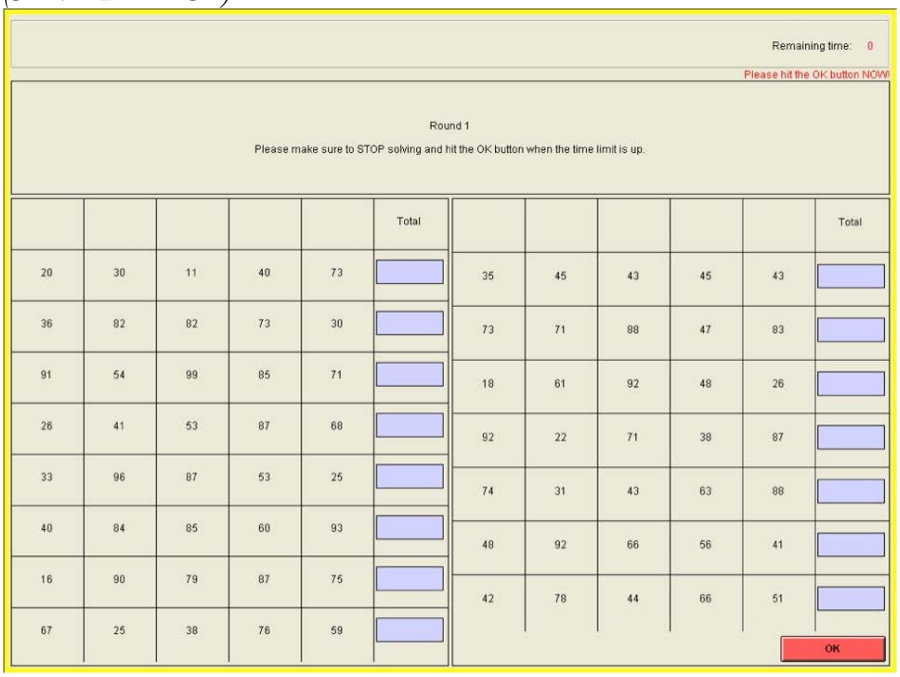
Participants in a previous study engaged in a number adding task. They were shown a table with rows of five two-digit numbers. The participants were asked and incentivized to add up as many rows of numbers as possible. This task was repeated several times, and each time, they had five minutes available.

While the task was otherwise identical, they saw different rows of numbers each time.

Their point score was calculated as follows:
- For every correctly added row of numbers, one point was added to their score.
- Rows of numbers that were not correctly added up received no points.

To have a better understanding of the task, please click on this button to see a sample task. (You will see the task for 30 seconds and not for the 5 minutes the participants did.)

(SAMPLE TASK)



<< (T1N, T1C or T2N, T2C >>

Participants in a previous study engaged in a word finding task. They were shown a matrix containing letters. Some letters appeared in random order and some formed words by combining letters next to each other horizontally, vertically or diagonally. A list of all words contained in a given matrix was displayed next to the matrix. The participants were asked and incentivized to find as many words from the list as possible. This task was repeated several times, and each time, they had three minutes available.

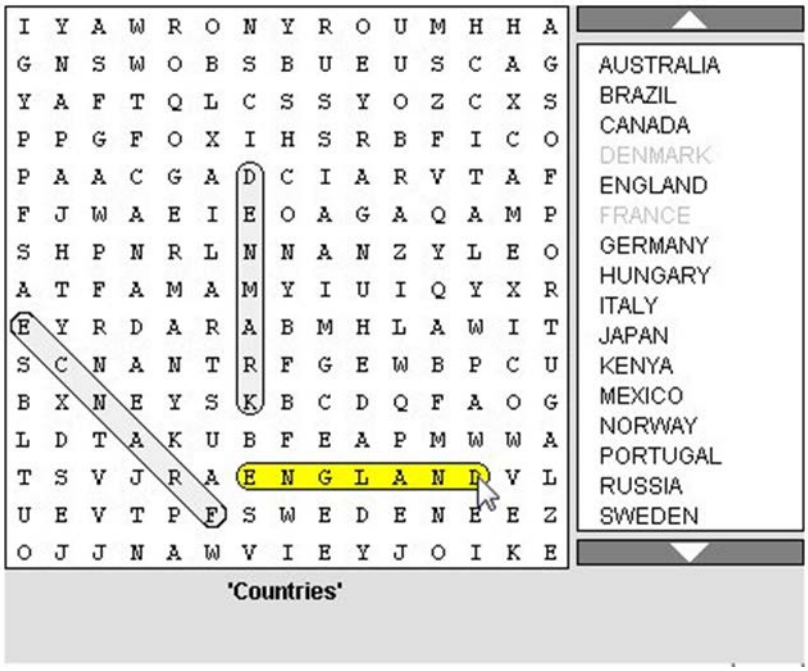
While the task was otherwise identical, they saw different matrices containing different letters and words each time.

Their point score was calculated as follows:

- For every correct word marked in the matrix, one point was added to their score.
- Words that were not marked correctly received no points.

To have a better understanding of the task, please click on this button to see a sample task. (You will see the task for 30 seconds and not for the 3 minutes the participants did.)

(INCLUDE MATRIX AND SHOW FOR 30 SECONDS)



Procedure to determine your earnings:

<<Math>>
Once you have chosen your five individuals, we will calculate your earnings, which are based on the total point score of your selected individuals. You will receive $0.20 for each point in your selected participants' third scores. For example, if your five chosen participants added up 50 rows of numbers correctly, they would score a total of 50 points and you would receive $10 (50x$0.20). We will inform you of the five chosen persons' total scores and your earnings at the end of this experiment.

<<Verbal>>
Once you have chosen your five individuals, we will calculate your earnings, which are based on the total point score of your selected individuals. You will receive $0.20 for each point in your selected participants' third scores. For example, if your five chosen participants found 50 words correctly, they would score a total of 50 points and you would receive $10 (50x$0.20). We will inform you of the five chosen persons' total scores and your earnings at the end of this experiment.

Information on Participants:

You will now be informed about the characteristics of 20 study participants who performed the task you just saw. This information is on the 20 cards that you are receiving from the experimenters. Each card represents a profile of one of the 20 participants, including participant number, demographic characteristics, and two of three performance scores. The cards are in random order. Your task is to select five of these individuals. You will be paid based on their third performance score.

<<T1N>>
<<Math>>
In a previous experimental session exactly like yours, 62% of the people chose more women than men.

<<Verbal>>
In a previous experimental session exactly like yours, 46% of the people chose more women than men.

<<T2N>>
<<Verbal>>
In a previous experimental session exactly like yours, 71% of the people chose more women than men.

<<Math>>
In a previous experimental session exactly like yours, 29% of the people chose more women than men.

<<T1C, T2C>>
[In a previous experimental session exactly like yours, people chose both women and men]

Note that you can select each participant only once.

<<All>>

If you have any questions, please press the "assistance" button now. Once we have addressed all questions, we will move to the main question of this study:

Main question: Select five people out of the 20 profiles you were presented. Their total third score on the task will determine your earnings.
Please remove the cards of the five selected people from the pile.

PLEASE PRESS OK ONLY AFTER YOU RECEIVED THE 20 CARDS.

<<Experimenter hands out 20 cards to each subject; content of cards is described below. >>

Math Task Candidates

	Math Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5

Gender	Male	Male	Female	Female	Female
Performance score 1	8	15	15	4	15
Performance Score 2	8	15	14	4	15
Race	White	White	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Male	Female	Female	Male
Performance score 1	10	9	8	14	5
Performance Score 2	11	9	7	14	4
Race	Asian	Asian	Black	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 11	Participant 12	Participant 13	Participant 14	Participant 15
Gender	Male	Male	Male	Female	Male
Performance score 1	15	10	9	8	13
Performance Score 2	14	10	9	7	15
Race	White	Black	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 16	Participant 17	Participant 18	Participant 19	Participant 20
Gender	Female	Female	Male	Male	Female
Performance score 1	11	7	4	7	3
Performance Score 2	12	8	5	9	4
Race	White	Black	Black	Asian	Asian
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

Verbal Task candidates

	Word Participants

Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Female	Female	Female	Male	Male
Performance score 1	6	11	11	13	8
Performance Score 2	9	13	15	12	8
Race	Hispanic	Black	White	White	Black
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Female	Female	Male	Male
Performance score 1	9	13	11	5	12
Performance Score 2	11	9	11	5	11
Race	White	Asian	Asian	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 11	Participant 12	Participant 13	Participant 14	Participant 15
Gender	Female	Female	Male	Male	Male
Performance score 1	16	4	16	10	10
Performance Score 2	15	5	15	9	13
Race	White	Black	White	Hispanic	Asian
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 16	Participant 17	Participant 18	Participant 19	Participant 20
Gender	Female	Female	Male	Male	Male
Performance score 1	15	10	15	13	6
Performance Score 2	12	8	12	13	6
Race	White	Asian	White	White	White
Nationality	American	Other	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

<<Math>>

Please enter the participant numbers of your five selected profiles for the number adding task, ranking people, such that the 1st person is your top choice, and the 5th is the least preferred choice.

<<Verbal>>
Please enter the participant numbers of your five selected profiles for the word finding task, ranking people, such that the 1st person is your top choice, and the 5th is the least preferred choice.

<<Table as before>>

LOTTERY CHOICE DECISION TASK
We will now present you with a list of lottery questions. You will have two options to choose from: option A and option B. You will have 10 decisions to make.
Once you are done the computer will randomly select 1 of the 10 rows. Then the computer will execute the lottery described in the cell that you have selected in that row and display the lottery outcome. The computer program will pay out the lottery outcome with a 10% probability. That is, one out of 10 people receive the payoffs of the selected lottery in this task as additional earnings.

	Option A	**Option B**
1	Probability 1/10 to get $12 and probability 9/10 to get $9.6.	Probability 1/10 to get $23.1 and probability 9/10 to get $0.60.
2	Probability 2/10 to get $12 and probability 8/10 to get $9.6.	Probability 2/10 to get $23.1 and probability 8/10 to get $0.60.
3	Probability 3/10 to get $12 and probability 7/10 to get $9.6.	Probability 3/10 to get $23.1 and probability 7/10 to get $0.60.
4	Probability 4/10 to get $12 and probability 6/10 to get $9.6.	Probability 4/10 to get $23.1 and probability 6/10 to get $0.60.
5	Probability 5/10 to get $12 and probability 5/10 to get $9.6.	Probability 5/10 to get $23.1 and probability 5/10 to get $0.60.
6	Probability 6/10 to get $12 and probability 4/10 to get $9.6.	Probability 6/10 to get $23.1 and probability 4/10 to get $0.60.
7	Probability 7/10 to get $12 and probability 3/10 to get $9.6.	Probability 7/10 to get $23.1 and probability 3/10 to get $0.60.
8	Probability 8/10 to get $12 and probability 2/10 to get $9.6.	Probability 8/10 to get $23.1 and probability 2/10 to get $0.60.
9	Probability 9/10 to get $12 and probability 1/10 to get $9.6.	Probability 9/10 to get $23.1 and probability 1/10 to get $0.60.
10	Probability 10/10 to get $12 and probability 0/10 to get $9.6.	Probability 10/10 to get $23.1 and probability 0/10 to get $0.60.
11	Probability 10/10 to get $12 and probability 0/10 to get $9.6.	Probability 9/10 to get $23.1 and probability 1/10 to get $0.60.
12	Probability 10/10 to get $12 and probability 0/10 to get $9.6.	Probability 8/10 to get $23.1 and probability 2/10 to get $0.60.
13	Probability 10/10 to get $10 and probability 0/10 to get $8.	Probability 7/10 to get $23.1 and probability 3/10 to get $0.60.

14	Probability 10/10 to get $10 and probability 0/10 to get $8.	Probability 6/10 to get $23.1 and probability 4/10 to get $0.60.
15	Probability 10/10 to get $10 and probability 0/10 to get $8.	Probability 5/10 to get $23.1 and probability 5/10 to get $0.60.

<<*Payoffs lottery task*>>
The selected row in the lottery task was <<:D>>
The outcome of the lottery is; <<E>>
Your payoffs are: << F>>>

<<TOTAL PAYOFFS>>
Your total payoffs in this experiment are: <<A+Y+F>>

<<WE NOW CONTINUE WITH THE QUESTIONNAIRE>>
We now continue with a questionnaire while we are preparing your earnings from the experiment. This will take us at least 15 minutes, so please take your time.

17. Gender (male/female)
18. Age ()
19. Nationality (North-American/South-American/European or Australian or Russian/African/Asian/Middle Eastern)
20. Race (White/Black/Hispanic/Asian/other)
21. School (Harvard/ MIT/Other/Not a student)
22. Field of study (social science/ economics / science / humanities/ NA)
23. Current Program (College/Masters/PhD/other/NA)
24. GPA at college ()
25. SAT scores (Writing/Mathematics/Critical Reading)
26. Parental income (median household income is 4500) below median, at around median, above median)
27. What do you expect *your* annual household income in 10 years to be?
28. Parental education (N.A./ high school/ some college/ college/ PhD)
29. On a scale from 1 to 6, where 1 is not risk averse and 6 is extremely risk averse, how risk averse do you consider yourself?
30. On a scale from 1 to 6, where 1 is not loss averse and 6 is extremely loss averse, how loss averse do you consider yourself?
31. Do you feel happy/unsatisfied/angry/normal/sad/upset/bored/tired/energetic/excited
32. Any comments?

Thank you for your participation. Please remain seated if you are done, until we tell you it is ok for you to leave.
<<*Experimenters hand out receipts for them to sign, once these are signed, they receive an envelope with their earnings, and subjects can leave.*>