Gender Similarities in Self-Promotion: The Role of Stereotypes

Kalyani Chaudhuri*

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Evidence shows that men describe their professional skills more positively than women with similar experience in the labor market, a phenomenon known as the gender gap in "self-promotion". This paper presents one of the first clear drivers of this gender gap – stereotypes about the relative performance of men and women in different tasks. In a laboratory experiment, I randomly assign participants to a series of tasks that vary in the strength of gender stereotypes. I find that men self-promote up to 11 percentage points more than women with similar performance in male-stereotyped tasks, but this gender gap is completely reversed in female-stereotyped tasks. In non-stereotypical tasks, I find no significant gender gap in self-promotion. Two key mechanisms explain these results: both men and women form higher beliefs about their performance, and interpret information about their performance more positively, in tasks where stereotypes favor their own gender group. Addressing gender gaps in beliefs and self-confidence is therefore crucial for addressing the gender gap in self-promotion.

*PhD student in Economics, University of California, Davis. I am grateful to my advisors – Anujit Chakraborty, Burkhard Rezaee, and Arman Rezaee – for invaluable support throughout my doctoral journey. This paper benefited from several insightful discussions with Judd Kessler, Colin Sullivan, David Gill, Christoph Schlom, Deepika Chaudhuri, Christina Sun, Remy Beauregard, Ellen Anderson, and seminar participants at the Economic Science Association, Bay Area Experimental Economics Workshop, and Western Economic Association International. I gratefully acknowledge research funding from the Dean's graduate fellowship and the department of economics at UC Davis. The experiments in this paper were approved by the Institutional Review Board at UC Davis and were pre-registered at *AsPredicted*. All errors are my own. Email: kalyanic@ucdavis.edu, Website: https://kalyanic.weebly.com/.

1. Introduction

Despite significant advancements in gender equity, women continue to be paid and promoted at lower rates than men in the labor market (Blau and Kahn 2017). Evidence shows that part of this gap may be driven by men describing their professional skills more positively than women with similar experience – the gender gap in "self-promotion". Male workers provide higher ratings of their work in annual performance reviews in firms, relative to women with similar roles and experience (Abraham 2023; Bohnet et al. 2021; Paustian-Underdahl et al. 2014). Male authors use the words "novel" and "excellent" more often than females to describe their research in journal articles (Lerchenmueller et al. 2019). Since self-promotion is viewed favorably by employers (Exley and Kessler 2022), men are more likely to be hired and promoted compared to women with similar performance. To address gender disparities in career advancement, therefore, it is important to understand the drivers of the gender gap in self-promotion.

This paper explores the role of gender stereotypes in driving the gender gap in self-promotion. Gender stereotypes are an important line of investigation for two reasons. First, gender wage gaps are found to be smallest in occupations that are stereotypically associated with women, such as counseling and caregiving (United States Department of Labor, 2024). Female-typed occupations or domains may thus contain important insights for resolving gender disparities in the labor market. Second, the prior literature on self-promotion has mostly focused on mathematics, science, and leadership, tasks that are stereotypically associated with men (the domains are summarized in Appendix Table B). An exclusive focus on male-typed domains confounds the true drivers of the gender gap in self-promotion. Therefore, the literature is not able to identify whether the gender gap stems from intrinsic differences between men and women,[1] or because the task itself causes men and women to behave differently.

Motivated by these concerns, I design a laboratory experiment to study the effect of stereotypes on the gender gap in self-promotion. I measure self-promotion using a game of communication between "workers" and "employers", following the experimental paradigm by Exley and Kessler (2022). Workers take a test in a certain domain of knowledge and "self-promote" their test performance to employers using adjectives and likert scales. For

[1] Several influential papers in behavioral economics show that women are more altruistic than men (Andreoni and Vesterlund 2001; Croson and Gneezy 2009), women describe their achievements more modestly than men (Mancuso et al. 2022; Altenburger et al. 2017), and women are more truthful than men in games of deception (Capraro 2018; Erat and Gneezy 2012; Dreber and Johannesson 2008). Any of these factors could explain why men self-promote more than women with similar abilities.

example, workers are asked, "how strongly do you agree that you performed well on this test?", and their strength of agreement is a measure of self-promotion. Workers' self-promotion messages (but not their test scores) are anonymously shared with employers, who then decide payments for workers. Employers' earnings depend on the true test scores of the workers, and workers earn the payment chosen by the employers. Both workers and employers are aware of this setup. After self-promotion, workers also report beliefs about their test scores, and know that beliefs are not shown to employers or to any other participant. Section 2 details the design of this experiment.

I measure gender stereotypes based on the domain or category of tasks performed by the worker. Following behavioral models of stereotypes (Bordalo et al. 2019), male-stereotyped domains are those where high-performers are *representative* of men – they are more likely to occur among men, relative to women. Similarly, female-typed domains are those where high-performers are representative of women. Further, the magnitude by which representativeness differs between the two genders measures the strength of the gender stereotype. I carefully select and design eight distinct tasks in order to generate a range of stereotypes in my experiment. Section 3 documents that four out of eight domains are male-typed – video games, cars, sports, and mechanical reasoning. Three domains are female-typed (beauty products, home economics, Disney movies), and one is a neutral-typed domain where high performers are equally representative among men and women (verbal reasoning).

Importantly, I use an experiment to randomly assign workers to task domains, a step that is extremely challenging to accomplish in the field for several reasons. First, workers in real labor markets self-select their occupations, such that the average man (woman) in a male-typed occupation is not likely to be representative of the average man (woman) in the population. Second, true performance of workers is noisily observed in the field and is difficult to standardize across different jobs. Finally, a controlled experiment also allows me to control and rule out alternative channels – other than stereotypes – that may drive gender differences in self-promotion in the field.[2]

My experiment reveals two key sets of results. First, workers who obtain high scores on the test self-promote more than low-scorers, for both men and women, across all test domains. This suggests that workers understand the self-promotion questions and respond to them meaningfully in the experiment. Second, however, the magnitude of self-promotion differs by the worker's gender and the test domain. Within male-typed domains, men

[2]For example, men may self-promote more than women because employers view self-promotion as a positive signal for men, but not for women. I design my experiment such that worker's gender identity is not revealed to employers, which shuts down the possibility of gender discrimination.

self-promote 9.1 percentage points more than similarly-performing women, in line with the gender gap observed in the prior literature (Saccardo et al. 2024; Exley and Kessler 2022). In stark contrast, however, this gender gap is reversed within female-typed domains, where women self-promote 12.4 percentage points more than men with similar performance. Finally, I find no gender gap in self-promotion in the non-stereotypical domain of verbal reasoning. My findings, detailed in Section 4, are robust to multiple measures of stereotypes and self-promotion. Stereotypes therefore play an important role in shaping and driving the gender gap in self-promotion. The next part of the paper attempts to unpack this effect.

In Section 5, I investigate three potential mechanisms through which stereotypes might create symmetrical gender differences in self-promotion. First, conditional on true performance, stereotypes might cause men and women to form different *beliefs* about their performance. The Bordalo et al. (2019) model of stereotypes predicts that men (women) form higher beliefs about their performance as a domain becomes more male-typed (female-typed). As a corollary of this prediction, men form higher beliefs than similarly-performing women in male-typed domains, while this gap is reversed in female-typed domains.[3]

I collect two measures of beliefs in my experiment, described in Section 5.1. Workers are asked, "how many questions do you think you answered correctly in this test?" (absolute beliefs), and "what is the probability that your score is above the median score in this test?" (relative beliefs). I find that, within male-typed domains, men form 5.9 percentage points higher beliefs than similarly-performing women. However, this gap is reversed in female-typed domains, where women's beliefs are 6.7 percentage points higher than men's. I also find that beliefs are highly correlated with self-promotion (80% correlation coefficient), for both men and women, across all types of domains. Beliefs about own performance, therefore, form a major component of self-promotion. Stereotypes create gender differences in beliefs, thereby creating gender differences in self-promotion.

As a second mechanism, I test whether stereotypes create gender differences in the desire to be perceived favorably by employers. A vast literature on *social image* concerns shows that individuals care about being perceived as altruistic, fair, honest, and progressive in several economic contexts. In male-typed domains, men might care more than women that employers perceive them as competent, while these motives may be reversed in female-typed domains. To test this mechanism, I design a new treatment that has no

[3]In the Bordalo et al. (2019) model, a decision-maker's belief about herself in a domain is shaped, in part, by comparing the performance of her own gender with that of the opposite gender. Beliefs about own performance are then exaggerated in the direction of true gender gaps. In this sense, stereotype-driven beliefs contain a "kernel of truth".

employers or strategic observers of self-promotion (Section 5.2). The new *Private* treatment is identical to the baseline in all respects except that there are no employers, wages, or framing related to the labor market. Participants describe their test performance using adjectives and agreement ratings in return for a flat completion reward.

Relative to the baseline, I find that the *Private* treatment reduces self-promotion levels for both men and women, in all domains, for all levels of test performance. This makes sense as the Private treatment has no employers and no incentives to exaggerate messages in order to increase potential wages. However, this decrease in self-promotion is similar for men and women, in all test domains. As a result, the gender gap in self-promotion stays unchanged between the two treatments. Stereotypes, therefore, do not create significant gender differences in expected returns from employers or concerns about the performance image conveyed to employers.

So far in the experiment, workers self-promote and form beliefs simultaneously, as they are not told anything about their test scores. To truly disentangle beliefs from self-promotion, we need to create an environment where individuals self-promote without having to form beliefs about their performance. I therefore design a third treatment – the *Information* treatment – that is identical to the Private treatment, except that participants learn about their test scores before self-promoting their performance. They are told how many questions they answered correctly in the test (absolute performance), and their percentile rank compared to all other test-takers (relative performance).

Perhaps surprisingly, I find that stereotypes continue to create gender differences in self-promotion even after workers do not need to form beliefs about their performance (Section 5.3). In male-typed domains, men self-promote 8 percentage points more than similarly-performing women. This gender gap reverses, but is not statistically significant, in female-typed domains. Thus, men interpret information about their performance more positively than women in male-typed domains. This finding presents a challenge for policies in the labor market: feedback about performance might reduce, but not eliminate, gender gaps in self-promotion, especially in male-typed domains. The paper concludes with a discussion of these implications in Section 6.

Contributions to the Literature. To my knowledge, this paper provides the first evidence a clear driver of the gender gap in self-promotion. A vast literature has explored this question, both in field and lab settings, but has been unable to pin down the drivers of the gender gap. This literature finds that the gender gap persists even after controlling for worker performance, seniority, role, and firm, (Abraham 2023; Peng et al. 2022; Bohnet

et al. 2021; Murciano-Goroff 2022; Lerchenmueller et al. 2019; Altenburger et al. 2017; Paustian-Underdahl et al. 2014) and even after workers have precise information about their performance and the appropriateness of self-promotion (Saccardo et al. 2024; Exley and Kessler 2022).[4]

This paper also offers the first evidence of women self-promoting *more* than men, to my knowledge of the literature. Using small samples, two prior studies found null gender gaps in self-promotion in verbal, teamwork, and communication skills – domains that are intuitively female-stereotyped (Abraham 2023; Exley and Kessler 2022). Peng et al. (2022) found that women in the social sciences self-promoted their research more than those in the physical sciences (a more male-typed domain). While this evidence hints that stereotypes play a role in the gender gap, my paper is the first to investigate the formal effect of stereotypes, and to show that the gender gap reverses in female-typed domains.[5]

My paper also connects to a larger literature on how stereotypes impact labor, educational, and behavioral outcomes. Female students are less likely to take up math courses or to enroll in demanding high schools when exposed to teachers with stronger stereotypes (Carlana 2019; Carlana and Corno 2024). Employers are more likely to hire male workers in male-typed domains and women in female-typed domains, holding fixed all other signals of worker performance (Coffman et al. 2024b; Reuben et al. 2014). Individuals are more likely to enter competitive tournaments, interpret feedback positively, and share their ideas with a group in domains that stereotypically aligned with their gender identity (Bordalo et al. 2019; Coffman et al. 2024c,a; Coffman 2014). My paper additionally demonstrates the effect of stereotypes on a novel outcome — self-promotion — and identifies the channels underlying this effect. I find that individuals not only form higher beliefs about their performance in stereotypical domains, as shown in Bordalo et al. (2019), but also interpret information about their performance more favorably in these domains.

The findings of my paper also address a few methodological and measurement concerns in experimental economics. Experimental subjects usually struggle to understand incentive-

[4]Prior literature has found that certain factors reduce, but not eliminate, the gender gap in self-promotion. The 13 percentage-point unconditional gender gap in self-promotion in a finance firm reduces to 5 percentage-points after controlling for worker seniority, region, and managers' reviews (Bohnet et al. 2021). The 12 percentage-point gender gap in Saccardo et al. (2024) also shrinks to 6 percentage points when workers are told about norms of self-promotion: "Prior workers who scored above 70% in the test described their test performance as excellent".

[5]Exley and Kessler (2022, pg. 33) also encouraged a formal test of the role of stereotypes in driving the gender gap in self-promotion: "That we do not observe a gender gap in self-evaluations when participants are asked about their performance on a verbal test suggests that a gender gap in self-evaluations is less likely in female-typed domains... Future work is needed to assess the effect of communicating self-evaluations to employers in female-typed domains."

compatible measures of beliefs, such as scoring rules and Becker-Degroot-Marschak valuations (Danz et al. 2024, 2022; Charness et al. 2021; Cason and Plott 2014). In my sample, incentive-compatible measures of beliefs are 80% correlated with non-incentivized measures of self-promotion such as "how strongly do you agree that you performed well?" at the individual level, for both absolute and relative beliefs. This suggests that subjective measures may proxy for, and improve comprehension relative to, traditional measures of beliefs. Subjective measures may be especially suitable for populations with low numerical literacy or when incentivized measures are not essential to the research question. Finally, my paper introduces two new domains – beauty and home economics – with strong female stereotypes and a large performance advantage favoring women. This fills an important gap in prior experimental literature where female stereotypes are weaker and smaller in magnitude, compared to male stereotypes (Coffman et al. 2024a; Bordalo et al. 2019).

2. Experimental Design

My experiment is designed to measure performance and self-promotion between participants in the roles of "workers" and "employers". The workers' survey involves two main components: (a) performance in a series of incentivized knowledge tests, and (b) self-promotion of test performance to an employer in return for wages. The employers' survey does not involve any cognitive tests. Instead, employers are told that workers in a previous survey took a test and described their performance in that test. Employers are shown one self-description for each worker (and no other information about that worker) and are incentivized to report the maximum amount they are willing to pay the worker. Workers receive the payment chosen by their matched employer. The employer's payoff is equal to the worker's true test score, net of the amount they pay the worker. This setup is communicated to both workers and employers, and is graphically summarized below in Figure 1. Below I describe each component and the motives underlying my design choices in detail.

2.1. Worker Survey

Performance. Workers are first informed that they will be asked to take three tests of knowledge and describe their performance in these tests. They are told that each test is in a different domain of knowledge, but the specific domain for a test will be informed right before the start of the test. Following three comprehension questions, Part 1 of the survey begins with a test in one knowledge domain randomly selected from a set of eight

possible domains. I use eight distinct domains in order to generate a wide spectrum of gender stereotypes and statistical power to detect an effect of stereotyping. Based on data from my pilot experiments and prior economic literature on stereotypes (Coffman 2014; Coffman et al. 2024a; Bordalo et al. 2019), four of these domains are expected to be associated with a male performance advantage (mechanical reasoning, cars, sports, and video games) and four others with a female performance advantage (verbal reasoning, home economics, Disney movies, and beauty products)[6].

Each test includes twenty multiple-choice questions, all of which are shown in random order on one page for a maximum of three minutes. Screenshots of sample questions are in Figure A1 in the Appendix. Each question has exactly one correct answer out of five possible choices that are shown in random order. An on-screen timer shows the time remaining to complete the test, and the page auto-submits after three minutes. Copying, printing or screen-shotting survey content is disabled on all pages of the survey. The worker earns 15 cents for each question answered correctly; there are no penalties for skipping a question or answering incorrectly. After each test, the worker is asked to describe her test performance as part of an anonymous interaction with another research participant in the role of an employer. The worker is not told about her test score or rank in any domain until the end of the survey when she learns about her total earnings.

Performance descriptions (Self-promotion). This portion of the survey is built on the classic paradigm of self-promotion introduced by Exley and Kessler (2022). Workers earn a minimum reward of 20 cents for completing this portion of the survey, and one of their responses is anonymously shared with another participant in the role of an employer. Workers are asked to describe their performance in response to five questions and are told that exactly one of these descriptions will be shown to their randomly-matched employer. The employer will then decide the maximum amount they are willing to pay the worker, up to 20 cents. First, workers are asked the open-ended question: "Please describe how well you think you performed in this test". Next, workers choose one adjective from a list of adjectives (terrible, very poor, neutral, good, very good, exceptional) to describe their individual and relative performance in the test. The two adjective questions are, "Individually, how well do you think you performed on this test?" and "Relative to other

[6]Five domain suggestions were borrowed from prior literature (Coffman 2014; Bordalo et al. 2019; Coffman et al. 2024a). I designed and pilot-tested three other domains from scratch – mechanical reasoning, home economics, and beauty products. To my knowledge, these three domains have not been used in prior experiments on stereotypes.

workers on Prolific, how well do you think you performed on this test?"[7]. Finally, workers are asked to indicate how strongly they agree with each of the following statements, on a scale of 0-100: "Individually, I performed well on this test", and "Relative to other workers, I performed well on this test". Labels on the agreement scale explain that a higher value indicates stronger agreement with the statement. Screenshots of these outcomes are shown in the Appendix (Figure A3).

Performance descriptions constitute the main outcomes of interest in my experiment, and in subsequent experimental treatments I vary the incentives and information associated with this outcome. Section 5 describes these additional treatments.

Beliefs about Performance. After completing the self-promotion section, workers are told that their interaction with the employer is over. They are then asked two measures of beliefs about their performance (Figure A4). They are asked "How many questions do you think you answered correctly in the test?"(belief about absolute performance), for which they earn an additional 20 cents if they can accurately estimate their true score. They are also asked, "What is the % chance that your score is above the median test score in this category?" (belief about relative performance) for which they earn a flat reward of 20 cents.[8]

Perceptions and Demographics. The final portion of the survey (part 4) collects workers' perceptions about the relative performance advantage of men and women in different domains. Workers are shown names of four knowledge domains different from the ones that they attempted in parts 1-3 of the survey[9]. For each domain, workers are asked to indicate on a 21-point scale ranging from -1 to 1, "Do you think men know more than women, or women know more than men in this domain?". The instructions explain that a positive value on the scale represents the perception that men know more than women, a negative value that women know more than men, and zero represents that neither gender has a performance advantage over the other (Figure A5). Finally, I collect a set of demographics including age, gender, race, courses taken in high school, and whether they attended high

[7]The adjectives and rating questions are elicited separately for individual and relative performance, in order to study whether descriptions are correlated with beliefs about absolute and relative ability. This separation enriches the coarser measures of self-promotion used in prior literature, such as "How well do you think you performed on this test?" (Exley and Kessler 2022; Saccardo et al. 2024).

[8]I chose a flat payment scheme for eliciting beliefs of relative performance because respondents in my pilot experiments indicated difficulty understanding the instructions associated with a theoretically incentive-compatible method such as the Becker-Degroot-Marschak mechanism.

[9]I specifically chose to elicit gender perceptions in domains separate from the ones they were tested on in the survey, to minimize the effects of own test performance on perceptions.

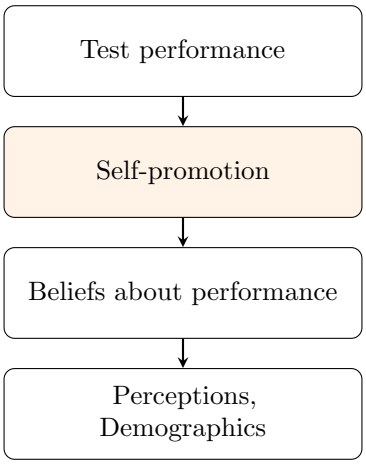


FIGURE 1. Experiment Design: Baseline

school in the US. The survey ends with information about total earnings based on their test score and the employer's payment in one randomly-selected domain.

Importantly, the survey does not mention the words "gender", "man", "woman", or "stereotype" until the very end when I elicit perceived stereotypes and demographics. This ensures that the performance descriptions and performance estimates in the earlier parts of the survey are not affected by social desirability bias or experimenter demand effects.

2.2. Employer Survey

Employers are told that the researchers conducted another study on the same research platform, where participants in the role of workers took a knowledge test and described their test performance. Employers observe one self-description for each of 24 workers in one test domain, with no information about the workers' identities, test scores, or other measures of self-descriptions. Employers then decide the maximum amount they are willing to pay each worker, in any integer amount between 0 and 20 cents.

I specifically chose not to reveal worker demographics to employers in order to rule out the possibility of gender discrimination and gender-based backlash by employers. Note that prior experiments have found substantial gender gaps in self-promotion even when workers' gender identity is not revealed to employers (Saccardo et al. 2024; Exley and Kessler 2022). I thus design my experiment to (a) replicate prior experimental designs, and (b) study gender differences in self-promotion even in the absence of potential gender discrimination. In future work, I aim to study gender gaps in settings where employers may discriminate based on workers' gender identities, and workers may anticipate this discrimination. I discuss the potential equilibrium effects of gender gaps in self-promotion

in the concluding section 6.

For each worker, the employer's earnings increase in the worker's test score and decrease in the maximum payment they choose for that worker. Employers' incentives were designed with two goals in mind: (1) truthfully eliciting their maximum willingness to pay the worker, and (2) minimizing the role of other-regarding and altruistic preferences in their payment decisions. Employers' wages are therefore elicited as "bids" using the Becker-Degroot-Marschak mechanism as follows. The worker is *hired* if the employer's bid is greater than or equal to a random number drawn from the set of all integers between 0 and 20. In this case, the employer earns in cents the number of test questions that the worker answered correctly (out of 20 total questions in the test), net of the randomly-drawn integer between 0 and 20. The hired worker earns a "wage" equal to the randomly drawn integer. In contrast, if the employer's bid is less than the randomly-drawn integer between 0 and 20, then the worker is *not hired* and neither the employer nor the worker earn a bonus. Employers are also paid a guaranteed 20 cents for each transaction so that their earnings never fall below zero.

2.3. Implementation

All surveys in this experiment were programmed using JavaScript and deployed using *Qualtrics*. This project received ethics approval from the University of California, Davis, with IRB ID 2081915-2. The hypotheses, outcomes, sample sizes, and analysis plans were pre-registered on AsPredicted.org.[10] Participants were recruited from *Prolific*, an online research platform that provides access to nationally representative samples in North America and verifies participants to rule out bots. Participants in the worker survey earned a completion reward of $2.6 and additional variables bonuses up to a maximum bonus of $3.4. The median time taken to complete the survey was 18 minutes, and average payments were $4 per participant. The baseline survey was distributed to a gender-balanced sample of 500 participants registered on Prolific, who were residing in the US, were between 18 and 59 years of age, and identified as either man or woman [11]. Despite these recruitment criteria, 11 participants out of 500 identified as non-binary in the gender elicitation question at the end of my survey. My final dataset thus includes 489 gender-binary participants (246 men and 243 women).

With each participant taking tests in three domains of knowledge, I obtain 489 ×

[10]The pre-registration report is publicly accessible at https://aspredicted.org/gkg4-7dpm.pdf

[11]Since theories of stereotypes are currently based on binary gender groups (Bordalo et al. 2019), I decided not to recruit gender non-binary participants and pre-registered this choice.

3 = 1,467 clustered observations, or approximately 184 observations in each domain of knowledge in my baseline experiment. I also conduct two additional experimental treatments with new participants, described later in section 5. The following section describes my hypotheses for the baseline experiment.

3. Measurement and Hypotheses

3.1. Measuring Stereotypes

To define and measure gender stereotypes, I follow economic theories of stereotypes introduced by Bordalo et al. (2019, 2016). Stereotyping refers to the idea that beliefs about the ability of a demographic group are formed, in part, by contrasting it to a natural reference group (for example, contrasting men with women, Blacks with Whites, etc). Beliefs are then *exaggerated* in the direction of true differences in abilities between the groups. When forming beliefs about own performance, for example, stereotype theories predict[12]:

- A *man* forms higher beliefs about his ability in domains where *men on average perform better than women*, relative to domains where men on average perform worse than women.
- A *woman* forms highers beliefs about her ability in domains where *women on average perform better than men*, relative to domains where women on average perform worse than men.

Measuring gender differences in average performance, therefore, is crucial for measuring gender stereotypes. Figure 2 documents average performance for men and women in each test domain of the experiment. In my experiment, men perform significantly better than women in sports, cars, mechanical reasoning, and video games, and women perform significantly better than men in Disney movies, home economics, and beauty products. In verbal reasoning I find that men perform only 0.2 points better than women, and this difference is not statistically significant. Based on these performance gaps, sports, cars, mechanical reasoning, video games, and verbal are "male-typed" domains, while Disney movies, home economics, and beauty products are "female-typed" domains.

One concern with the above measure of stereotypes (Figure 2) is that true gender differences in performance in the experimental data may differ from how subjects perceive gender differences in performance based on their experiences outside the lab. Following

[12]The mathematical assumptions and predictions of Bordalo et al. (2019)'s model are summarized in Appendix B.3.

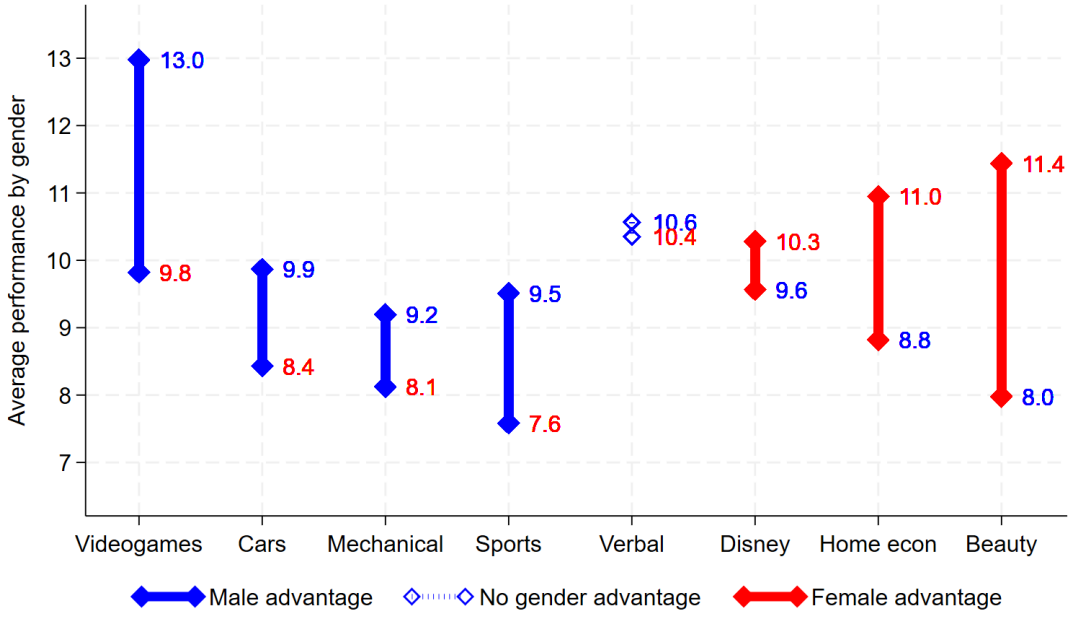


FIGURE 2. Gender Differences in Performance

Note: This figure plots average test performance for men and women in each test domain. A test had a maximum possible score of 20 and a minimum score of 0. Blue text labels indicate men's average scores, and red text labels indicate women's average scores in a test domain. Blue solid bars indicate that men on average performed significantly better than women, and red solid bars indicate that women on average performed significantly better than men ($p < 0.01$ in a one-sided t-test of difference in means by gender). The dotted blue line indicates no significant difference between men's and women's average test performance. The sample includes 2,925 performance observations combined across the baseline and the private treatment.

Bordalo et al. (2019), therefore, I collect an additional measure of stereotypes in my experiment – perceived performance advantage of men relative to women in each test domain. As described in Section 2, for four domains workers are asked to indicate on a scale from -1 to 1, whether they think that men know more than women (positive values on the scale), women know more than men (negative values on the scale), or that men and women are equally competent in that domain. Figure 3 documents the average perceived gender gap in performance in each test domain. The perceived gender gaps are strongly correlated with the true gender gaps in performance observed in Figure 2 (correlation coefficient 91.1). Table 1 summarizes all measures of gender stereotypes in the experiment. Out of a total of eight test domains, four are clearly male-typed (video games, cars, mechanical reasoning, sports), three are clearly female-typed (beauty products, home economics, Disney movies), and one domain (verbal reasoning) produces an ambiguous and weak gender stereotype.

3.2. Hypotheses

If stereotypes indeed affect the gender gap in self-promotion, we would expect the gender gap (men self-promoting more than women) to be larger in domains that are classified as male-typed, and relatively smaller in female-typed domains. Since I collect multiple measures of gender stereotypes (Table 1), I can test the effect of stereotypes on the extensive margin (does the gender gap in self-promotion differ between male-typed and female-typed domains?) as well as on the intensive margin (does a marginal increase in the measure of stereotype increase the gender gap in self-promotion?). Following are the two sets of hypotheses tested in this paper.

HYPOTHESIS 1. *Men self-promote more than similarly-performing women in male-typed domains, but this gender gap is relatively smaller in female-typed domains.*

Empirically, I estimate the following specification at the level of worker i who takes a test in domain D_i:

$$\begin{aligned}\text{Self-Promotion}_{D_i} = \beta_0 + \beta_1 \textit{Female}_i + \beta_2 \text{Male-typed domain}_{D_i} + \\ \beta_3 \textit{Female}_i \times \text{Male-typed domain}_{D_i} + \gamma \text{Performance}_{D_i} + \epsilon_i \end{aligned} \quad (1)$$

$\textit{Female}_i$ is a binary variable indicating that the worker identified as a woman in the experiment.[13] Male-typed domain$_{D_i}$ is an indicator that takes the value 1 if men on

[13]The demographic survey elicited a worker's gender using the question, "Which of the following best describes your gender identity? (1) Man, (2) Woman, (3) Non-binary, or (4) Prefer to Self-describe."

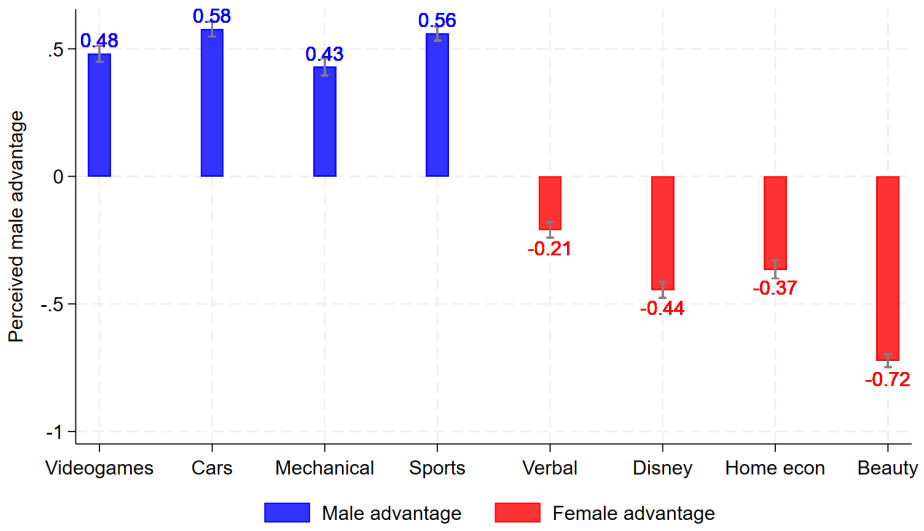


FIGURE 3. Perceived Male Advantage by Domain

Note: The perceived male advantage for a domain is the average response to the question, "Do you think there is a gender difference in expertise in this domain? On a scale from -1 to 1, drag the slider towards 1 if you think that men know more, towards -1 if you think women know more, or at 0 if you think there is no gender difference". A positive value indicates a perceived male advantage, and a negative value indicates a perceived female advantage. Sample includes 3,860 perceptions combining the baseline and the private treatment. Error bars denote 99% confidence intervals.

TABLE 1. Measures of Stereotypes

	Male advantage (measured) $\in [-20, 20]$	Binary stereotype (measured)	Male advantage (perceived) $\in [-1, 1]$	Binary stereotype (perceived)
Video games	3.156	Male-typed	0.481	Male-typed
Sports	2.131	Male-typed	0.56	Male-typed
Cars	1.437	Male-typed	0.577	Male-typed
Mechanical	1.073	Male-typed	0.429	Male-typed
Verbal	0.217	Male-typed	-0.21	Female-typed
Disney	-0.717	Female-typed	-0.445	Female-typed
Home econ	-2.131	Female-typed	-0.365	Female-typed
Beauty	-3.461	Female-typed	-0.728	Female-typed

Note: The table presents four measures of stereotypes for each domain – two continuous measures and two binary measures – following the Bordalo et al. (2019) definition of stereotypes. Male advantage (measured) is the difference between average test scores of males and females in a domain, and each domain had a maximum score of 20 points. Male advantage (perceived) is the average value on a slider scale ranging from -1 to 1, where a higher value indicates the perception that men know more than women in that domain. A domain is classified as male-typed (female-typed) if its corresponding male advantage is positive (negative).

average perform better than women in domain D_i. $Performance_{D_i}$ measures the number of questions answered correctly by worker i in a test in domain D_i. Holding fixed worker performance, the coefficients $\beta_1 + \beta_3$ measure the gender gap in self-promotion (i.e., the difference between women's and men's self-promotion) within male-typed domains. Within female-typed domains, this gender gap is measured by the coefficient β_1.

In addition to the binary measure of stereotypes above, the magnitude of the gender gap in performance in a domain also provides a continuous measure of stereotypes. As a second hypothesis, I use the continuous measure to test how a marginal increase in the value of stereotypes affects the gender gap in self-promotion.

HYPOTHESIS 2. *Controlling for individual performance, the difference between men's and women's self-promotion increases as the domain becomes more male-typed.*

I test this hypothesis using the following specification for worker i who takes a test in domain D_i:

$$\begin{aligned}\text{Self-Promotion}_{D_i} = \beta_0 + \beta_1 Female_i + \beta_2 \text{Male stereotype strength}_{D_i} + \\ \beta_3 Female_i \times \text{Male stereotype strength}_{D_i} + \gamma \text{Performance}_{D_i} + \epsilon_i\end{aligned} \tag{2}$$

Male stereotype strength$_{D_i}$ is the value of the male advantage in domain D_i. Table 1 shows that this variable is measured as either (a) the difference between men's and women's average test scores in the domain, or (b) the perceived advantage of men relative to women in that domain. All other variables are identical to the ones in equation (1). For a fixed level of worker performance, $\beta_1 + \beta_3$ measures the difference between women's and men's self-promotion when the strength of the male stereotype is 1% (men's average performance in the domain is 1% higher than women's). Similarly, β_1 measures the gender gap in self-promotion when the strength of the male stereotype is zero.

4. Results: Gender Gaps in Self-Promotion

This section estimates the effect of stereotypes on the gender gap in self-promotion. In section 4.1, I first use a binary measure of stereotypes – whether the test domain is classified as male-typed. In section 4.2, I use a continuous measure of stereotypes – the amount by which men perform better (or are perceived to perform better) than women in the domain.

4.1. Discrete measure of stereotypes

As shown in Table 1, four out of eight test domains in my experiment are male-typed, while three are female-typed. The Verbal domain is classified as gender-neutral with a weak and ambiguous gender stereotype. The analyses presented in this section assume verbal as a male-typed domain. The results are qualitatively robust to classifying verbal as a female-typed domain, as shown in Appendix Figure A6.

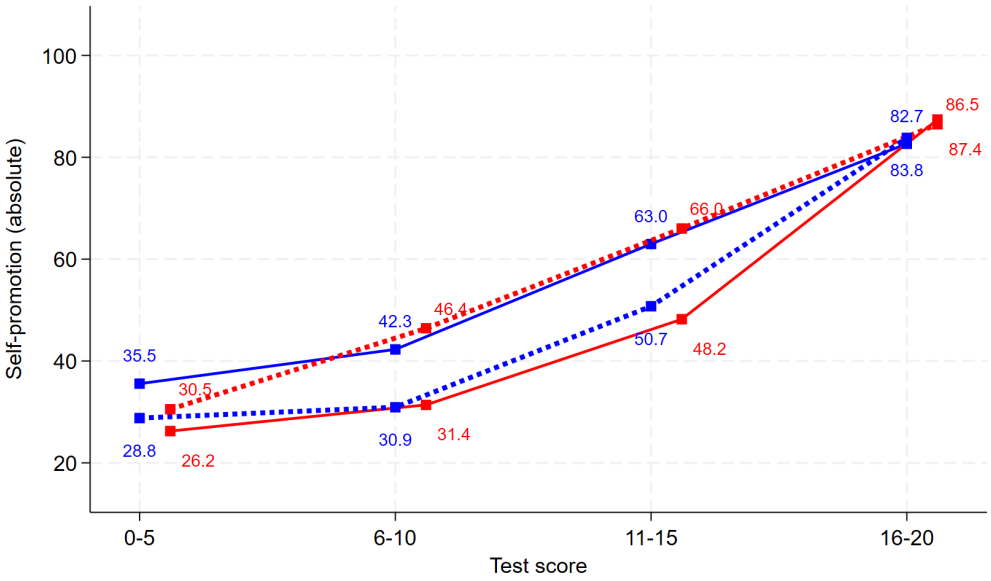
The experiment contains several measures of self-promotion, including adjectives, agreement ratings, and free-form text. The following paragraph presents results from an agreement measure of self-promotion, while other measures are examined in later paragraphs and in the Appendix. The agreement question asks: On a scale of 0-100, how strongly do you agree with the statement, "Individually, I performed well on this test?". Figure 4 plots average self-promotion for four bins of test scores, separately by male-typed and female-typed domains, separately for men and women. Three aspects of this figure are discussed below.

First, self-promotion is increasing in true test performance, across both types of domains, for both men and women. Workers who obtain higher test scores are also more likely to agree that they performed "well" on the test. Second, within male-typed domains (represented by solid lines), male workers self-promote more than women for almost all levels of test performance, replicating the traditional "gender gap in self-promotion" documented in prior studies. The only exception is the set of high-performers (who scored between 16 and 20 points), where women self-promote slightly more than men even within male-typed domains. Third, within female-typed domains, women self-promote substantially more than men, as the dashed red line lies above the dashed blue line for the first three bins of test scores. However, high-performing males who score 16 or more points on the test self-promote at similar rates as high-performing females in female-typed domains. Figure A7 in the appendix displays standard errors for each of these estimates, and shows that these gender effects are statistically significant for the two central bins of test performance. Appendix Section B.1 shows that these descriptive results are similar for other measures of self-promotion, such as adjectives chosen to describe absolute and relative performance (Figures A8 and A9). These results support hypothesis 1.

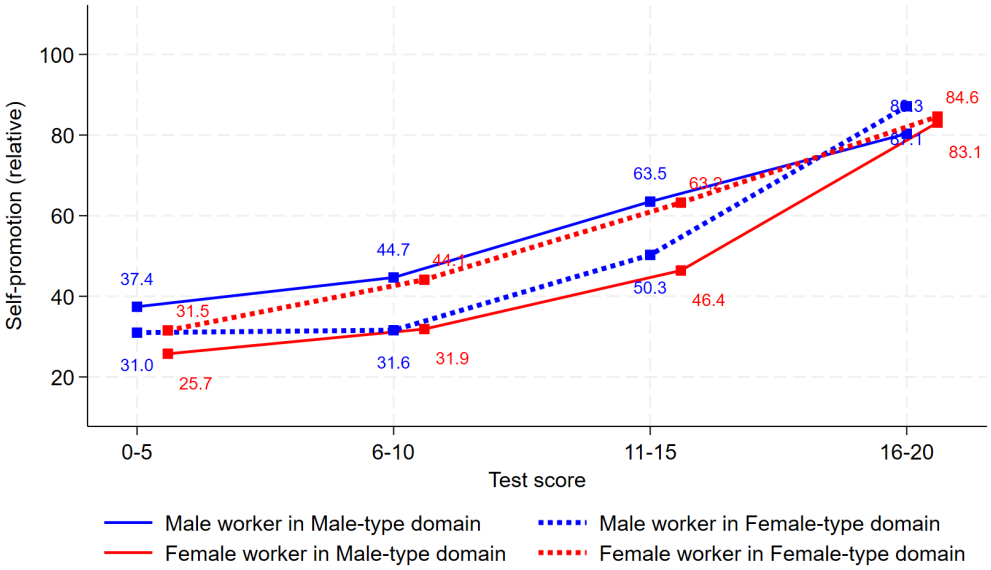
A limitation with these figures is that they do not formally control for the worker's true test performance, and neither do they account for standard errors being correlated at the worker level. The following regression, reproduced from Section 3, accounts for these issues

FIGURE 4. Stereotypes and Gender Gaps in Self-Promotion

A. Self-promotion (absolute performance)



B. Self-promotion (relative performance)



Note: This figure plots gender differences in self-promotion, separately for different domains of task performance. Self-promotion (absolute) is a worker's strength of agreement on a scale of 0-100 to the statement, "Individually, I performed well on this test". Self-promotion (relative) is their agreement to, "Relative to other workers, I performed well on this test". Blue lines represent male workers, while red lines represent female workers. Solid lines indicate male-typed domains where men are over-represented among high-performers (Mechanical reasoning, Cars, Video games, Sports, and Verbal). Dashed lines represent female-typed domains where women are over-represented among high-performers (Home economics, Beauty products, and Disney movies). The sample contains 1,467 observations from the baseline experiment.

and estimates the effect of the domain-stereotype on the gender gap in self-promotion.

$$\text{Self-Promotion}_{D_i} = \beta_0 + \beta_1 \textit{Female}_i + \beta_2 \text{Male-typed domain}_{D_i} + \beta_3 \textit{Female}_i \times \text{Male-typed domain}_{D_i} + \gamma \text{Performance}_{D_i} + \epsilon_i$$

This estimation controls for performance using fixed effects for each raw score in the test, clusters standard errors at the worker level, and also controls for other demographics such as race, level of education, and an indicator for attending high school in the US. Table 2 reports results from this estimation for four outcomes of self-promotion: Column (1) reports a worker's agreement to the statement, "Individually, I performed well in the test", while Column (2) reports agreement to the statement, "Relative to other workers on Prolific, I performed well in the test". Columns (3) and (4) report the strength of adjectives chosen by the worker in response to, "Individually, how do you think you performed on this test?" and "Relative to other workers on Prolific, how do you think you performed on this test?". All outcomes are rescaled to an interval of [0,1] so that coefficients can be interpreted as percentage points. Of particular interest are the estimates of gender gaps in self-promotion at the bottom half of the table.

Table 2 supports the descriptive findings documented in Figure 4 for all measures of self-promotion. Controlling for true test performance, men in male-typed domains agree 8.4 percentage points more strongly than men in female-typed (incongruent) domains, that they individually performed well on the test. Similarly, women in female-typed domains agree 12.4 percentage points more than women in male-typed (incongruent) domains. When contrasting women's agreement in a male-typed domain with men's agreement in a female-typed domain (i.e. when both gender groups are in incongruent domains), the gender gap is only 0.7 percentage points, and not statistically different than zero. The results are qualitatively similar for other measures of self-promotion in columns (2) through (4) in Table 2.

4.2. Continuous measure of stereotypes

In this section I use a more granular measure of gender stereotypes: the magnitude by which one's own gender group performs better (or is perceived to perform better) than the opposite gender group, closely following the measure introduced by Bordalo et al. (2019). Specifically, I estimate the following model reproduced from section 3, equation (2):

$$\text{Self-Promotion}_{D_i} = \beta_0 + \beta_1 \textit{Female}_i + \beta_2 \text{Male stereotype strength}_{D_i} +$$

$$\beta_3 Female_i \times \text{Male stereotype strength}_{D_i} + \gamma \text{Performance}_{D_i} + \epsilon_i$$

For worker i who takes a test in domain D_i, Male stereotype strength$_{D_i}$ refers to the magnitude by which men perform better than women in test domain D_i. All other variables are identical to those in equation 1. I also include fixed effects for each raw score in the test, cluster standard errors at the worker level, and control for worker demographics like race and education.

Table 3, column (1) shows that, when the strength of the male stereotype is 1%, men self-promote 1.06% more than women with similar performance, when agreeing with the statement "Individually, I performed well on this test". Importantly, when the strength of the male stereotype is zero, the gender gap in self-promotion is only 0.0005% and statistically insignificant, as shown by the coefficient on *Female*. Figure 5 plots the gender gap in self-promotion (the coefficients $\beta_1 + \beta_3$ from equation 2) for the entire range of stereotype strength, from strongly female stereotypes to strongly male stereotypes. This figure shows that the gender gap favoring men (men's self-promotion - women's self-promotion) keeps increasing as the domain becomes more male-typed, but this gap is symmetrically reversed with an increase in the female stereotype. There is no significant gender gap for a null value of the stereotype strength. All these results are qualitatively unchanged for alternate measures of self-promotion (columns (2)-(4) in Table 3), and for alternate measures of stereotypes, such as the perceived advantage of men relative to women in a domain (Appendix Table A1).

Following are three key takeaways from all the results so far. First, men self-promote more than similarly-performing women in male-typed domains, but this gap is completely reversed in female-typed domains. Second, the magnitude of the gender gap (the difference between men's and women's self-promotion) increases with the strength of the male stereotype. Finally, for a null measure of stereotypes, i.e. in a gender-neutral domain, there are no significant gender differences in self-promotion. The evidence supports both hypotheses (1) and (2). Taken together, these results imply that intrinsic differences between men and women cannot explain the traditional gender gap in self-promotion. Instead, the domain of task performance appears to create gender differences in a symmetrical manner. The next section examines the drivers of these symmetrical gender gaps in self-promotion.

TABLE 2. Stereotypes (discrete) and Gender Gaps in Self-promotion

	Agreement strength		Adjective strength	
	(absolute)	(relative)	(absolute)	(relative)
Female	0.124***	0.0968***	0.112***	0.0816***
	(0.024)	(0.024)	(0.022)	(0.023)
Male-type domain	0.0843***	0.0924***	0.0707***	0.0861***
	(0.019)	(0.019)	(0.018)	(0.018)
Female x Male-type domain	-0.215***	-0.211***	-0.182***	-0.176***
	(0.027)	(0.027)	(0.025)	(0.025)
Gender gaps in self-promotion	*(female-male)*			
Male-type domain	-0.0914***	-0.114***	-0.0700***	-0.0945***
	(0.019)	(0.019)	(0.017)	(0.018)
Female-type domain	0.124***	0.0968***	0.112***	0.0816***
	(0.024)	(0.024)	(0.022)	(0.023)
Stereotypical domain	0.0395*	0.00433	0.0414**	-0.00445
	(0.020)	(0.020)	(0.019)	(0.020)
Non-stereotypical domain	-0.00712	-0.0213	0.000679	-0.00843
	(0.023)	(0.023)	(0.021)	(0.021)
Performance fixed effects	✓	✓	✓	✓
Demographic controls	✓	✓	✓	✓
Observations	1467	1467	1467	1467

Note: This table presents estimates from the specification in equation (1). Agreement (absolute) in column (1) is a worker's strength of agreement to the statement, "Individually, I performed well on this test". Agreement (relative) in column (2) is a worker's strength of agreement to, "Relative to other workers on Prolific, I performed well on this test". Columns (3) and (4) denote strength of adjectives chosen by workers in response to, "Individually, how do you think you performed on this test?" and "Relative to other workers on Prolific, how do you think you performed on this test?" Higher numbers indicate stronger agreement or more favorable adjectives. All outcomes are re-scaled to the interval [0,1] so that coefficients can be interpreted in percentage points. Male-typed domain is an indicator for the domains of mechanical, cars, sports, video games, and verbal. Performance fixed effects are dummies for each possible raw score on the test. Demographic controls include age, race, level of education, and an indicator for attending high school in the US. Standard errors, shown in parentheses, are clustered at the worker level.

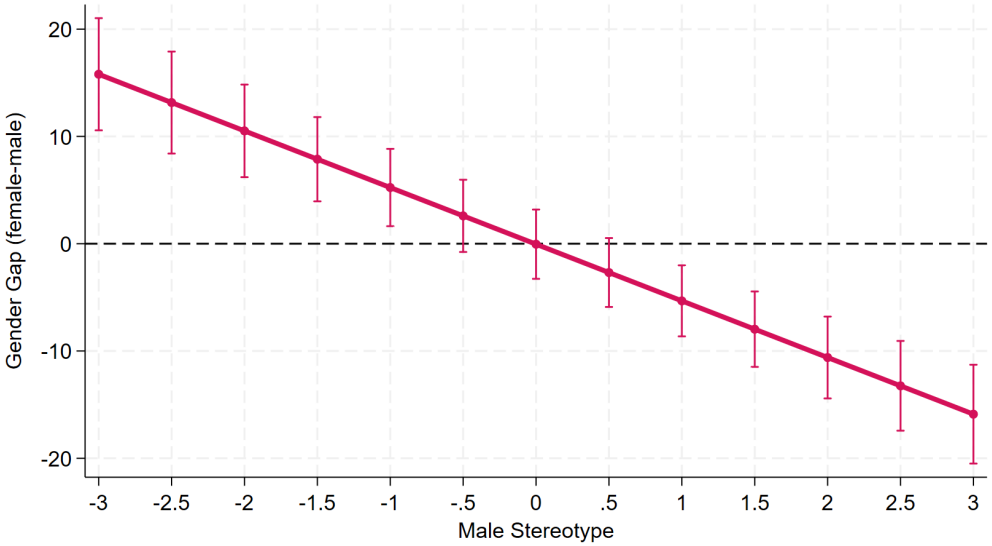
TABLE 3. Stereotypes (continuous) and Gender Gaps in Self-promotion

	Agreement strength		Adjective strength	
	(absolute)	(relative)	(absolute)	(relative)
	(1)	(2)	(3)	(4)
Female	-0.000456	-0.0253	0.00726	-0.0205
	(0.016)	(0.017)	(0.015)	(0.016)
1% Male stereotype	0.370***	0.330***	0.335***	0.312***
	(0.086)	(0.087)	(0.083)	(0.086)
Female x Male stereotype	-1.056***	-1.017***	-0.910***	-0.867***
	(0.126)	(0.128)	(0.116)	(0.121)
Constant	0.221**	0.223*	0.231*	0.198*
	(0.099)	(0.116)	(0.131)	(0.119)
Gender gaps in self-promotion:				
1% male stereotype: Female - Male	-1.057***	-1.042***	-0.903***	-0.888***
	(0.125)	(0.127)	(0.114)	(0.120)
Performance fixed effects	✓	✓	✓	✓
Demographic controls	✓	✓	✓	✓
Observations	1467	1467	1467	1467

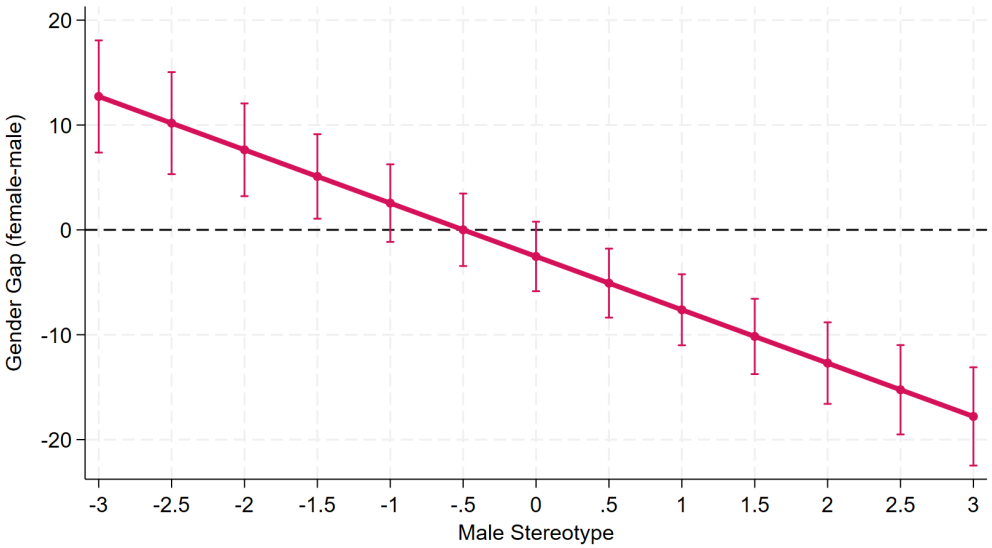
Note: This table presents estimates from equation (2). *Male Stereotype* denotes the magnitude by which men perform better than women in a test domain. Agreement (absolute) in column (1) is a worker's strength of agreement to the statement, "Individually, I performed well on this test". Agreement (relative) in column (2) is a worker's strength of agreement to, "Relative to other workers on Prolific, I performed well on this test". Columns (3) and (4) denote the strength of adjectives chosen by workers in response to, "Individually, how do you think you performed on this test?" and "Relative to other workers on Prolific, how do you think you performed on this test?" Higher numbers indicate stronger agreement or more favorable adjectives. All outcomes are re-scaled to lie in the interval [0,1] so that coefficients can be interpreted in percentage points. Performance fixed effects are dummies for each possible raw score on the test. Demographic controls include age, race, level of education, and an indicator for attending high school in the US. Standard errors, shown in parentheses, are clustered at the worker level.

FIGURE 5. Stereotypes (continuous) and Gender Gaps in Self-Promotion

A. Gender Gaps in Self-promotion (absolute)



B. Gender Gaps in Self-promotion (relative)



Note: This figure plots the gender gap in self-promotion for a range of values of male stereotypes. The y-axis plots the difference between women's and men's self-promotion, represented by the coefficients $\beta_1 + \beta_3$ from equation (2). The x-axis plots a range of stereotypes, ranging from strongly female-typed (men's average performance is up to 3 points lower than women's) to strongly male-typed (men's average performance is up to 3 points higher than women's). Self-promotion (absolute) is a worker's strength of agreement to, "Individually, I performed well on this test". Self-promotion (relative) is their strength of agreement to, "Relative to other workers on Prolific, I performed well on this test". A higher number represents stronger agreement. Error bars denote 95% confidence intervals.

5. Mechanisms

Why do stereotypes create symmetrical gender differences in self-promotion – men self-promoting more than women in male-typed domains, but a reversal of this gap in female-typed domains? I consider two potential mechanisms that may explain this result. First, conditional on true performance, stereotypes might cause men and women to form different *beliefs* about their performance. Second, stereotypes might create gender differences in the *image* that workers want to convey to employers. In male-typed domains, men might care more than women about employers perceiving them as competent; these image concerns may be different in female-typed domains. I test each of these mechanisms below using additional analyses and new treatments in my experiment.

5.1. Gender Differences in Beliefs about Own Performance

The theories by Bordalo et al. (2016, 2019) predict that stereotypes associated with a domain distort individuals' beliefs about their ability in that domain. For example, when a man forms beliefs about his performance in mathematics, he exaggerates the true representativeness of his own gender group among high-performers in math. In other words, he correctly recalls that men on average perform better than women in math[14], but exaggerates this true performance gap when forming beliefs about his own performance. As a consequence, men form higher beliefs than similarly-performing women in male-typed domains, and the reverse occurs in female-typed domains.

I collect two measures of beliefs to test how stereotypes affect gender differences in workers' beliefs about their ability. After workers complete the self-promotion part of the experiment, they are asked, "How many questions do you think you answered correctly in the test?" (absolute beliefs), and "What is the probability that your score was greater than the median score in this test?" (relative beliefs). Beliefs are incentivized based on accuracy.[15] Workers are told that this part of the survey is not shown to employers or to any other participants.

[14] Men are consistently found to perform better than women in the mathematics portion of standardized tests such as the SAT and ACT. Further, these differences are particularly large at the upper tails of the performance distribution, which captures the idea that high-performers are representative of men (Bordalo et al. 2019).

[15] For the absolute belief measure, workers earn 20 cents if their guess is accurate. For relative beliefs, they earn a flat rewards of 20 cents. My pilot surveys revealed that workers struggled to understand the instructions for an incentive-compatible elicitation of relative beliefs, such as the Becker-Degroot-Marschak mechanism. I therefore followed recent advice in the experimental literature (Danz et al. 2024, 2022) and elicited relative beliefs using simple introspection.

Figure 6 plots gender differences in beliefs for different levels of worker performance, separately for male-typed and female-typed domains. Similar to the self-promotion results in Figure 4, high performers on average for higher beliefs than low performers, for both measures of beliefs. Importantly, men form higher beliefs than women in male-typed domains, but these gaps are reversed in female-typed domains. To formally control for worker performance and account for clustered observations, I estimate the following specification that is similar to the ones in Section 4, except that the dependent variable measures beliefs instead of self-promotion:

For individual i who takes a test in domain D_i,

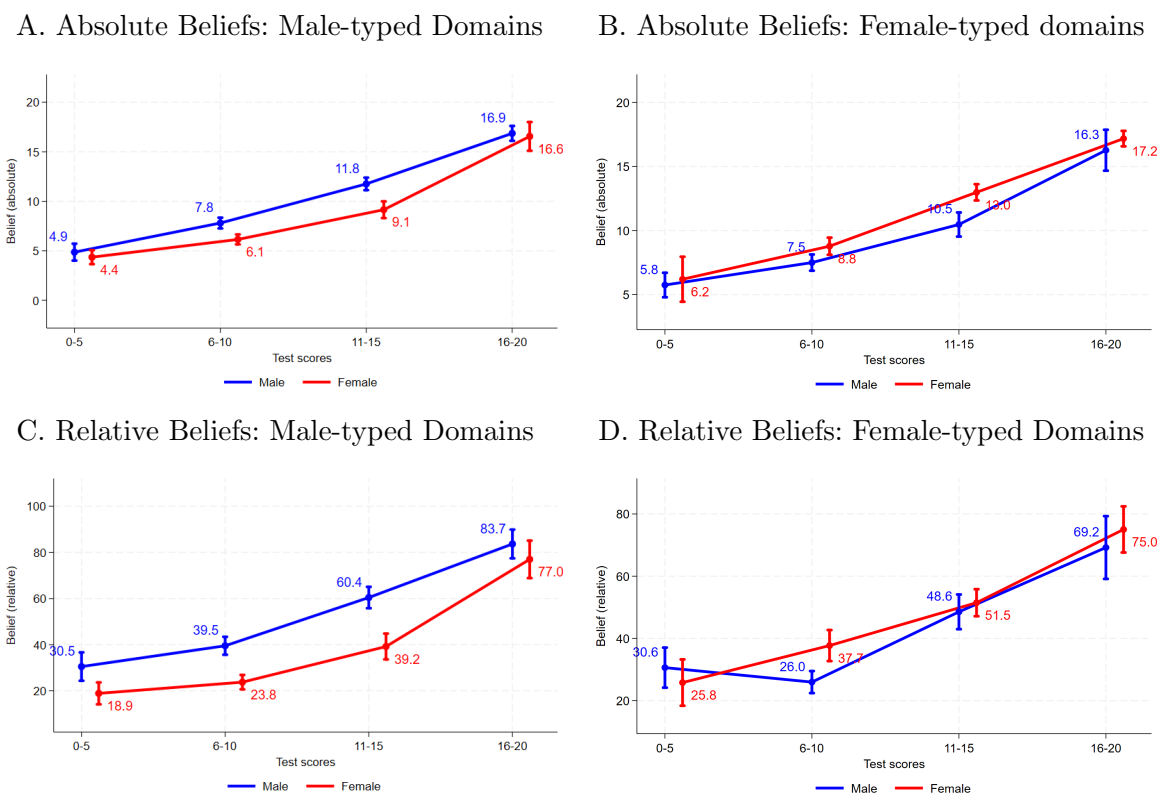
$$\begin{aligned}\text{Belief}_{D_i} = \beta_0 + \beta_1 \mathit{Female}_i + \beta_2 \text{Male stereotype strength}_{D_i} + \\ \beta_3 \mathit{Female}_i \times \text{Male stereotype strength}_{D_i} + \gamma \text{Performance}_{D_i} + \epsilon_i \end{aligned} \tag{3}$$

Table 4 presents the results from equation (3) for both measures of beliefs from the baseline experiment. All outcomes are re-scaled to the interval $[0, 1]$ so that coefficients can be interpreted in percentage points, and standard errors are clustered at the worker level. As in previous analyses, I include fixed effects for each possible test score, and control for worker demographics such as age and race.

I find that stereotypes create gender differences in beliefs in a manner similar to their effect on gender differences in self-promotion. For a 1% strength of male stereotype (in a domain where men's average performance is 1% better than women's), men form 0.65% higher absolute beliefs and 0.94% higher relative beliefs compared to women who perform similarly in that domain. Figure A10 in the Appendix shows that these gender gaps are reduced and eventually reversed with a decrease in the strength of male stereotypes (as the domain becomes more female-typed). Importantly, for a null measure of stereotypes, the gender gap in beliefs is small (0.003% for absolute beliefs and 0.04% for relative beliefs), and, in case of absolute beliefs, statistically insignificant.

The above results suggest that a worker's self-promotion is fundamentally shaped by their beliefs about their performance. In Figure 7 I plot the correlation between beliefs and self-promotion for all workers in the baseline experiment, separately for absolute and relative measures. I find that beliefs are strongly correlated with self-promotion (80% correlation coefficient, $p < 0.01$), and these correlation coefficients are nearly identical for men and women. This evidence is consistent with the results in Table 4 – gender differences in beliefs, rooted in gender stereotypes, appear to be major drivers of the gender gap in self-promotion.

FIGURE 6. Stereotypes and Gender Differences in Beliefs



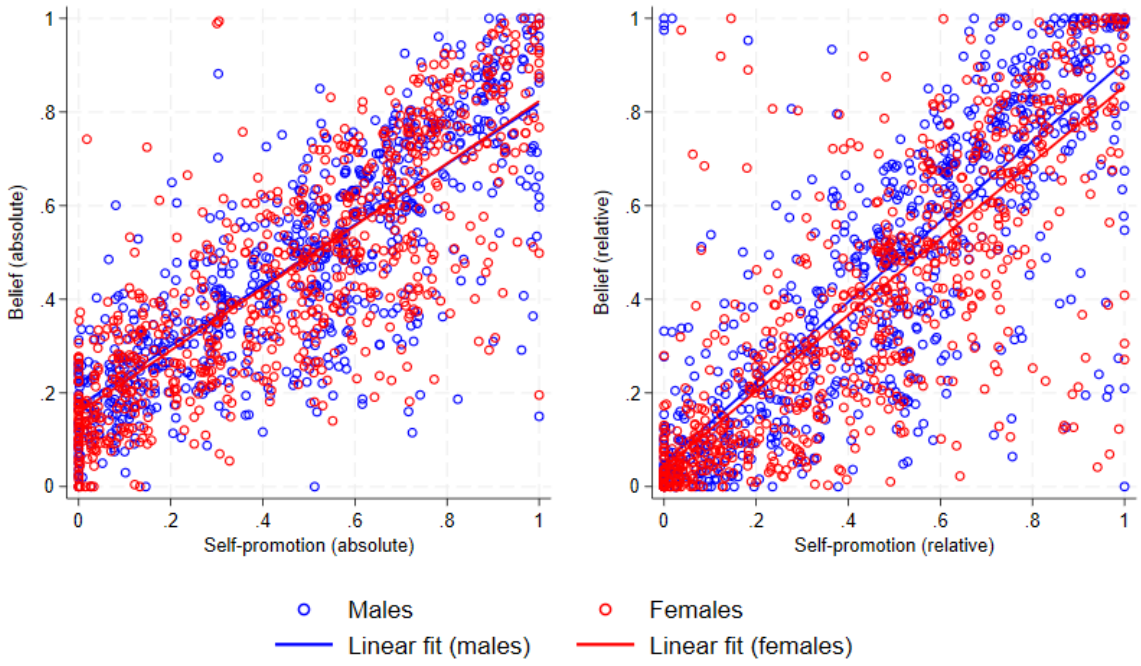
Note: This figure plots beliefs about absolute and relative performance by worker's gender and domain of task performance. Absolute belief is the response to the question, "How many questions do you think you answered correctly in the test"? . Relative belief is the response to, "What is the % chance that your score was higher than the median score in this test?". Blue lines represents a male worker, and red lines represent female workers. The sample contains 1,467 observations from the Baseline experiment. Error bars denote 90% confidence intervals.

TABLE 4. Stereotypes and Gender Differences in Beliefs

	(1) Belief (absolute)	(2) Belief (relative)
Female	-0.00304	-0.0494***
	(0.011)	(0.016)
1% Male stereotype	0.105*	0.379***
	(0.060)	(0.086)
Female × Male stereotype	-0.647***	-0.892***
	(0.088)	(0.128)
Constant	-0.112**	0.162
	(0.047)	(0.142)
Gender gaps:		
1% male stereotype: Female - Male	-0.650***	-0.942***
	(0.087)	(0.125)
Performance fixed effects	✓	✓
Demographics	✓	✓
Observations	1,467	1,467

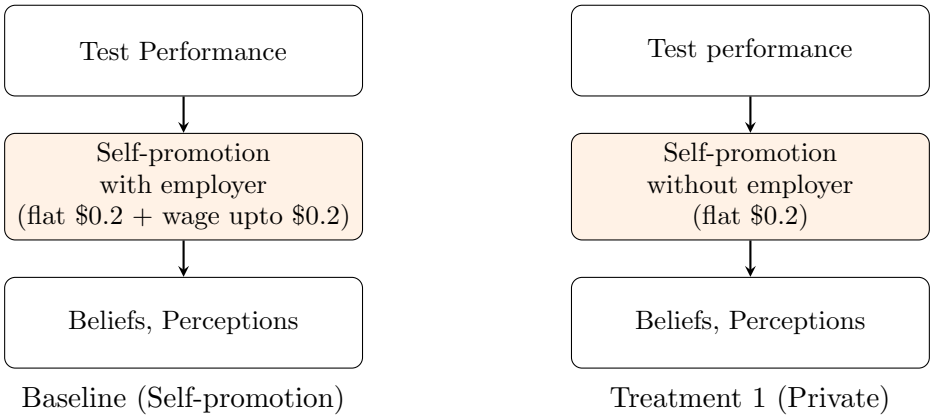
Note: This table presents estimates from the linear regression described in equation (3). Belief (absolute) is a worker's response to the question, "How many questions do you think you answered correctly in the test?". Belief (relative) is the response to, "What is the % chance that your score was higher than the median score in this test?". *Male Stereotype* denotes the magnitude by which men perform better than women in a test domain, re-scaled to the interval [-1,1]. All other variables are re-scaled to [0,1] so that coefficients can be interpreted in percentage points. The sample includes all 1,467 observations in the *baseline* treatment. Performance fixed effects are dummies for each possible raw score on the test. Demographic controls include indicators for race, level of education, and attending high school in the US. Standard errors, shown in parentheses, are clustered at the worker level.

FIGURE 7. Correlation between beliefs and self-promotion



Note: These scatter plots measure the correlation between beliefs (y-axis) and self-promotion (x-axis) at the worker level, separately for absolute and relative measures. Belief (absolute) is a worker's response to the question, "How many questions do you think you answered correctly in the test?". Self-promotion (absolute) is the worker's strength of agreement to, "Individually, I performed well on the test". Belief (relative) is the response to, "What is the % chance that your score was higher than the median score in this test?". Self-promotion (relative) is the worker's strength of agreement to, "Relative to other workers on Prolific, I performed well on the test". Blue indicates male workers, while red indicates female workers. The solid lines represent the linear regression of beliefs on self-promotion. All variables are re-scaled to the interval [0,1] for a uniform interpretation. The sample includes all 1,467 observations in the *baseline* treatment.

FIGURE 8. Experiment Design: Private Treatment



5.2. Gender Differences in Image Conveyed to Employers

A vast literature on social-image concerns shows that individuals care about being perceived as altruistic, honest, fair, and progressive across a variety of economic decisions (Dana et al. 2007; Andreoni and Bernheim 2009; Bénabou and Tirole 2011; Golman et al. 2017; Exley and Kessler 2023). Social image about one's ability could also be affected by stereotypes, such that men (women) might care more than women (men) about being perceived as competent in male-typed (female-typed) domains. The desire to be perceived more favorably by employers could drive one gender to self-promote more than the other in certain domains. To test this mechanism, we need to design a new environment without employers or wage returns to self-promotion.

In the *Private Treatment* (Treatment 1), a new set of participants take knowledge tests and describe their performance using adjectives and likert ratings in each test domain. However, there are no employers or wages or framing related to the labor market. Participants are simply asked to describe their performance as a part of the survey and earn a flat reward of 20 cents for completing this portion of the survey. The rest of the experiment is identical to the baseline version described in section 2: after describing their performance, participants report beliefs about their performance, and end the survey by reporting perceived gender stereotypes and demographics. The design is summarized in Figure 8.

For this treatment I recruit a new set of 486 participants on *Prolific* in a gender-balanced sample, following the same protocols and instructions as in the baseline. With each participant taking tests in three domains, I obtain $486 \times 3 = 1,458$ clustered observations, or approximately 182 observations per test domain.

There are two main hypotheses when comparing the baseline with the private treatment. First, if workers believe that employers offer higher wages in response to stronger self-promotion, then they might self-promote more in the baseline, relative to the private treatment without employers or wages. Second, if stereotypes affect gender differences in social image concerns, then we expect stereotypes to create larger gender gaps when self-promotion messages are shared with an employer, relative to when messages are private.

The data from the *Private* treatment reveals two important patterns (Figure 9). First, it replicates the symmetrical gender gaps in self-promotion observed in the baseline in Figure 4: men self-promote more than women in male-typed domains, but this gap is reversed in female-typed domains. Second, both men and women self-promote more in the baseline (dashed lines) than in the private treatment (solid lines), in line with the first

FIGURE 9. Stereotypes and Gender Differences in Social Image Concerns

A. Male-typed domains

B. Female-typed domains

Note: This figure plots gender differences in self-promotion, by treatment and domain. Panel (A) is restricted to male-typed domains, while Panel (B) is restricted to female-typed domains. Self-promotion (absolute) refers to a worker's strength of agreement with the statement, "Individually, I performed well on this test". Agreements are measured on a scale of 0-100, and higher values represent stronger agreement. In the *Baseline* treatment, workers' self-promotion is shared with an employer in return for wages. *Private* refers to the treatment without employers or wages. The sample includes 2,925 observations combining the *Baseline* and *Private* treatments.

hypothesis. Thus, both men and women understand the role of the employer in the baseline and inflate their performance descriptions, to increase their potential wages. However, is the magnitude of the gender gap in self-promotion different between the baseline and private treatment?

To test the social-image hypothesis, I estimate the following specification combining data from both the baseline and private treatments. For worker i who takes a test in domain D_i,

$$\begin{aligned}\text{Self-Promotion}_{D_i} = {} & \beta_0 + \beta_1 \mathit{Private}_i + \beta_2 \mathit{Female}_i + \beta_3 \text{Male stereotype}_{D_i} \\ & + \beta_4 \mathit{Private}_i \times \text{Female}_i + \beta_5 \mathit{Private}_i \times \text{Male stereotype}_{D_i} \\ & + \beta_6 \mathit{Female}_i \times \text{Male stereotype}_{D_i} \\ & + \beta_5 \mathit{Private}_i \times \mathit{Female}_i \times \text{Male stereotype}_{D_i} + \gamma \text{Performance}_{D_i} + \epsilon_i\end{aligned} \tag{4}$$

Here, $\mathit{Private}_i$ is a dummy that indicates whether worker i was assigned to the Private treatment that has no employers, wages, or labor-market framing. The other terms are identical to the ones defined earlier in equation (2). β_1 measures the difference in self-promotion between the private and baseline treatment, for male workers and for a null measure of stereotype. The corresponding measure for female workers is given by $\beta_1 + \beta_2 + \beta_4$. When the strength of the male stereotype is 1%, the gender gap in self-promotion in the Private treatment is given by $\beta_2 + \beta_4 + \beta_6 + \beta_7$. Similarly, the gender gap in self-promotion in the Baseline is given by $\beta_2 + \beta_6$. If the gender gap in the Baseline is larger than the gender gap in the Private treatment, then stereotypes create gender differences in the desire to be perceived as more competent by employers.

Table 5 presents the results from specification (4). The coefficient on *Private* is negative for all measures of self-promotion, which implies that (male) workers significantly reduce their self-promotion in the absence of employers. A similar pattern is observed for female workers, as the coefficients on *Female* and *Private* × *Female* are not significantly different than zero. In line with the descriptive result in Figure 9, therefore, both men and women decrease their self-promotion in the Private treatment, compared to the baseline where there are employers and potential wages to be earned from employers.

In the bottom half of Table 5, I estimate the gender gap in self-promotion for a 1% value of stereotype strength, separately for the private and baseline treatment. If the gender gaps are smaller in the private treatment, compared to the gender gaps in the baseline, then stereotypes cause men and women to convey a different social image to employers. For agreement ratings of absolute performance, I find that men self-promote 0.99% more

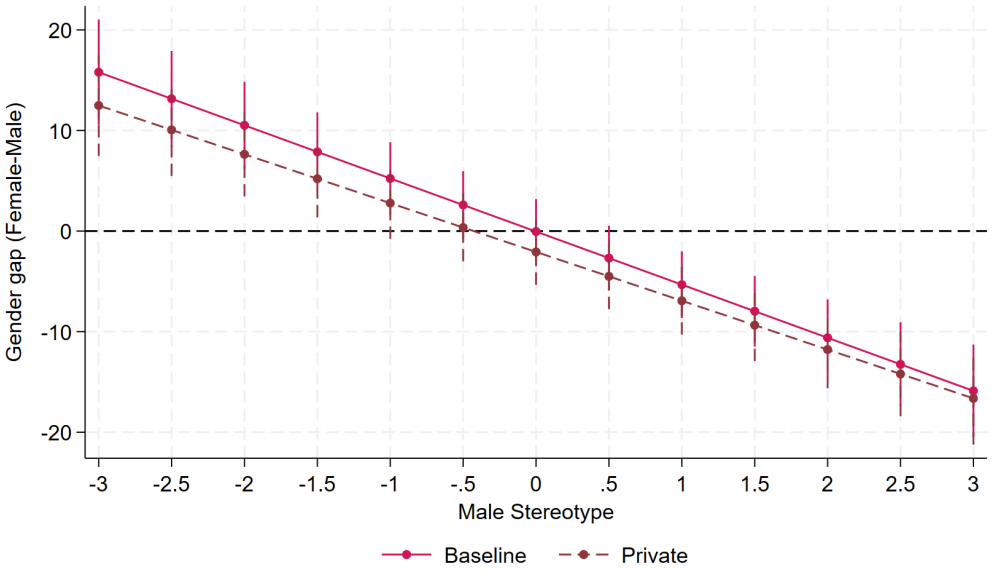
TABLE 5. Stereotypes and Gender Differences in Social Image Concerns

	Agreement strength		Adjective strength	
	(absolute)	(relative)	(absolute)	(relative)
	(1)	(2)	(3)	(4)
Private	-0.0582***	-0.0578***	-0.0492***	-0.0485***
	(0.017)	(0.017)	(0.016)	(0.016)
Male Stereotype	0.369***	0.315***	0.351***	0.310***
	(0.083)	(0.085)	(0.081)	(0.085)
Private × Male Stereotype	-0.0951	-0.0284	-0.154	-0.0464
	(0.108)	(0.112)	(0.105)	(0.109)
Female	-0.00216	-0.0258	0.00570	-0.0210
	(0.016)	(0.017)	(0.015)	(0.016)
Private × Female	-0.0147	-0.00677	-0.0212	-0.0128
	(0.024)	(0.024)	(0.022)	(0.022)
Female × Male Stereotype	-1.052***	-0.993***	-0.949***	-0.868***
	(0.122)	(0.124)	(0.112)	(0.117)
Private × Female × Male Stereotype	0.0819	0.129	0.177	0.0834
	(0.158)	(0.161)	(0.143)	(0.147)
Constant	0.282***	0.264***	0.283**	0.252**
	(0.082)	(0.099)	(0.129)	(0.118)
Gender gaps (female-male)				
1% male stereotype: Private	-0.987***	-0.896***	-0.787***	-0.818***
	(0.115)	(0.118)	(0.104)	(0.105)
1% male stereotype: Baseline	-1.054***	-1.018***	-0.943***	-0.889***
	(0.121)	(0.123)	(0.112)	(0.117)
1% male stereotype: Private−Baseline	0.0672	0.122	0.156	0.0706
	(0.157)	(0.160)	(0.142)	(0.147)
Performance fixed effects	✓	✓	✓	✓
Demographics	✓	✓	✓	✓
Observations	2,925	2,925	2,925	2,925

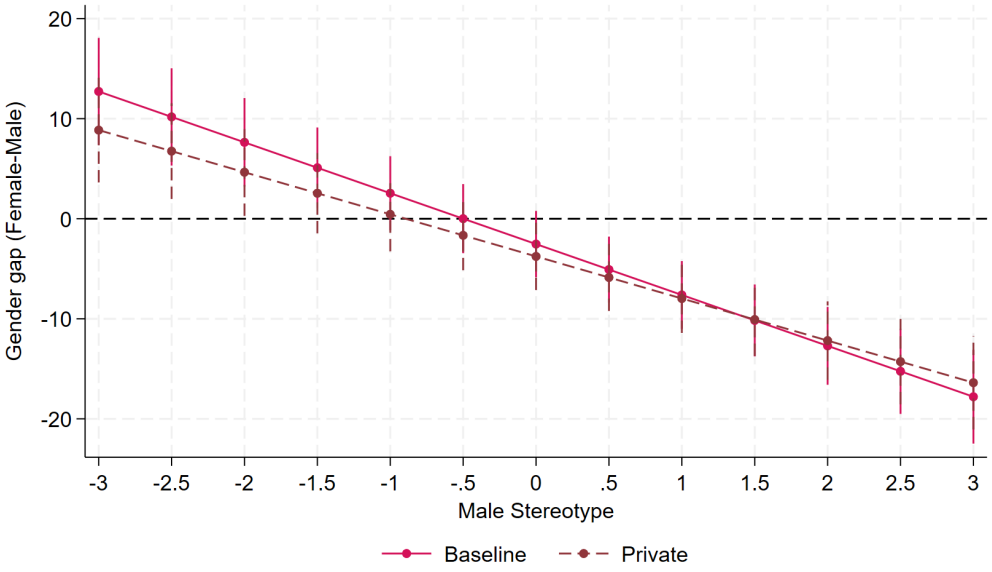
Note: This table presents the estimates from equation (4). *Male Stereotype* denotes the magnitude by which men perform better than women in a test domain, re-scaled to the interval [-1,1]. *Private* is an indicator for the treatment without employers, wages, or labor-market framing. All outcomes are re-scaled to the interval [0,1] so that coefficients can be interpreted in percentage points. Demographic controls include indicators for race, level of education, and attending high school in the US. Standard errors, shown in parentheses, are clustered at the worker level.

FIGURE 10. Stereotypes and Gender Differences in Self-promotion by Treatment

A. Self-promotion (absolute)



B. Self-promotion (relative)



Note: This figure plots the gender gap in self-promotion for a range of male stereotypes values, separated by treatment. In the *Baseline* the worker's self-promotion is shared with an employer, who chooses the worker's payment. The *Private* treatment includes no employers, wages, or labor-market framing. The y-axis plots the difference between women's and men's self-promotion, or the coefficients $\beta_1 + \beta_3$ from equation (2). The x-axis plots a range of stereotypes, from strongly female-typed (-3) to strongly male-typed (3). Self-promotion (absolute) is a worker's strength of agreement to, "Individually, I performed well on the test". Self-promotion (relative) measures agreement with, "Relative to others, I performed well on the test". A higher number represents stronger agreement. Error bars denote 95% confidence intervals.

than women in the private treatment, and 1.05% more in the baseline treatment. However, these two gender gaps are not significantly different, for any measure of self-promotion.

Figure 10 shows that this result persists for the all values of stereotype strength, ranging from strongly female-typed to strongly male-typed. The magnitudes as well as the directions of the gender gaps are very similar between the two treatments. Gender differences in social image concerns, therefore, do not appear to be major drivers of the gender gap in self-promotion.

5.3. Gender Differences in Self-Promotion without Belief Formation

The previous sections show that stereotypes create gender differences in beliefs about own performance, and these beliefs are highly correlated with self-promotion. Additionally, for a range of different stereotypes, the gender gaps in self-promotion are nearly unchanged in the absence of employers. Are beliefs, then, the *only* channel through which stereotypes affect the gender gap in self-promotion? In other words, if workers did not have to form beliefs about their performance before self-promotion, would there be no gender gaps in self-promotion?

I test this hypothesis using a new treatment where participants are given precise information about their test scores before they self-promote. There are no employers or wages in this *Information* treatment, so it is directly comparable to the *Private* treatment in section 5.2. The main difference from the private treatment is that individuals are told their exact test scores (how many questions they answered correctly), and their percentile rank (the percentage of participants on Prolific that obtained a score less than their own test score) after they complete a test. A comprehension question is used to ensure that they read and correctly understand this information. They are then asked the same self-promotion questions as in other treatment, and are paid a flat reward of 20 cents for completing this portion of the survey. Since the aim is to measure self-promotion without belief-formation, I do not elicit workers' beliefs at any point in this treatment.

I estimate the effect of stereotypes on the gender gap in self-promotion using equation (2) that is borrowed from the baseline experiment in section 4.2. Table 6 shows that the gender gap in self-promotion persists even after workers have accurate and precise information about their test performance. For a 1% strength of the male stereotype, men's self-promotion exceeds women's by 0.3% or 0.4%, controlling for true performance. This magnitude is smaller than those in previous treatments: 1.05% in the baseline (Table 5) and 0.98% in the private treatment (3). However, the small gender gap of 0.3% in the Information treatment is still significantly different from zero.

Figure 11 shows that the gender gaps in the *Informed* treatment are significantly smaller than those in the *Private* treatment, for all values of stereotype strength. However, stereotypes still have a positive and statistically significant effect on the gender gap in self-promotion in the Informed treatment. This results is particularly prominent in male-typed domains, where men self-promote significantly more than women. In female-typed domains, women do self-promote more than men, but this gender gap is not statistically significant.

There are two important takeaways from this result. First, it shows that stereotypes affect self-promotion even when individuals do not have to form beliefs about their performance. Men and women who perform similarly in the test and receive the same information about their test performance, still self-promote differently based on the domain of task performance. Thus, beliefs (measured by estimates of one's scores and rank) are not the only drivers of self-promotion. Perhaps self-promotion is also shaped by self-image concerns, or how individuals want to perceive their own performance described using adjectives and likert ratings. Second, the Information treatment offers insights on policies or solutions that may address gender disparities in self-promotion and career advancement. Figure 11 shows that gender gaps are significantly smaller when workers have precise information about their test scores, relative to when they have no information. However, workers still respond more positively to this information when it arrives in a stereotypical domain, as opposed to a non-stereotypical domain. Thus, gender gaps in self-promotion are still positive, and often statistically significant, even after information. In the labor market, this result implies that giving precise feedback to workers about their performance may reduce, but not eliminate, gender disparities.

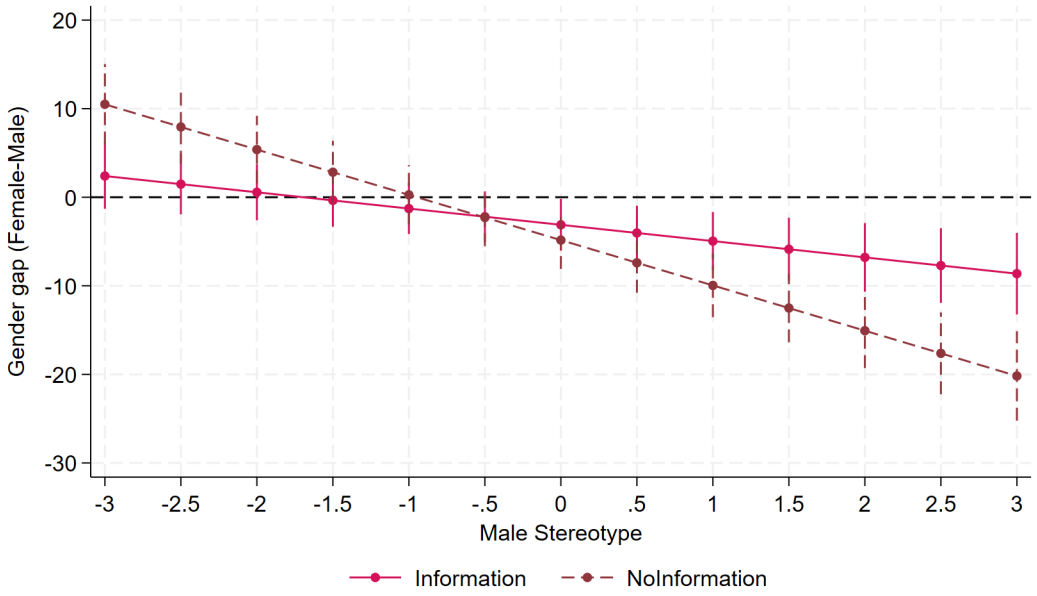
TABLE 6. Stereotypes and Gender Differences in Self-Promotion without Belief Formation

	Agreement strength		Adjective strength	
	(absolute)	(relative)	(absolute)	(relative)
	(1)	(2)	(3)	(4)
Female	-0.0311**	-0.0328**	-0.0198	-0.0227*
	(0.015)	(0.014)	(0.013)	(0.013)
1% Male stereotype	0.191***	0.138*	0.143**	0.151**
	(0.071)	(0.071)	(0.062)	(0.062)
Female x Male stereotype	-0.367***	-0.328***	-0.259***	-0.278***
	(0.101)	(0.100)	(0.093)	(0.092)
Constant	-0.0235	0.0183	-0.0735	0.0947
	(0.073)	(0.073)	(0.050)	(0.083)
Gender gaps:				
1% male stereotype: Female - Male	-0.399***	-0.361***	-0.279***	-0.300***
	(0.105)	(0.102)	(0.096)	(0.095)
Performance fixed effects	✓	✓	✓	✓
Demographics	✓	✓	✓	✓
Observations	1,491	1,491	1,491	1,491

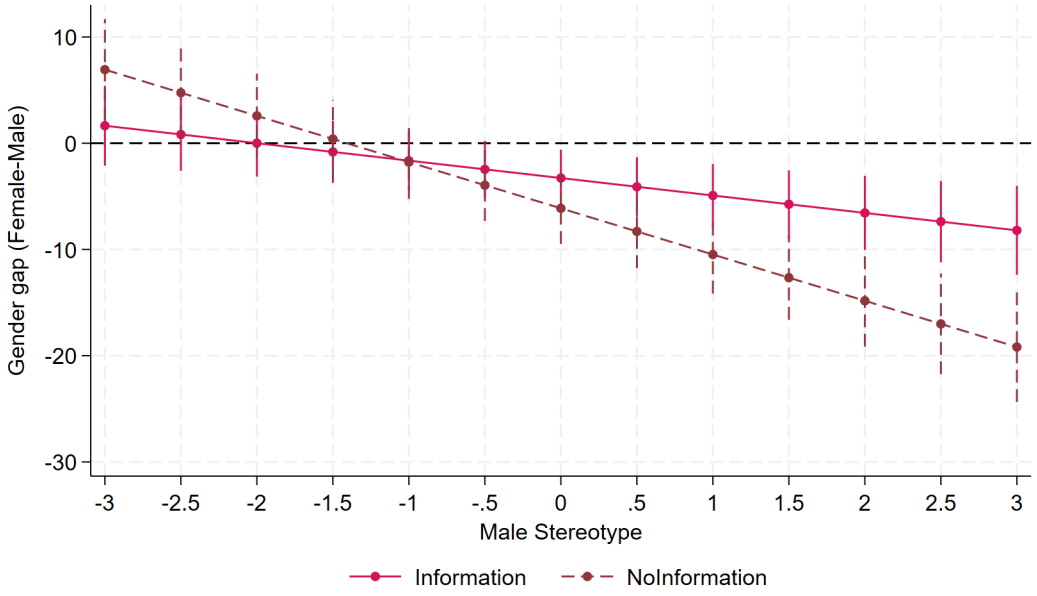
Note: This table presents the results from equation (2), with the sample restricted to the *Informed* Treatment where workers learn their test score and rank before self-promoting. *Male Stereotype* denotes the magnitude by which men perform better than women in a test domain, re-scaled to the interval [-1,1]. Agreement (absolute) in column (1) is a worker's strength of agreement to the statement, "Individually, I performed well on this test". Agreement (relative) in column (2) is a worker's strength of agreement to, "Relative to other workers on Prolific, I performed well on this test". Columns (3) and (4) denote the strength of adjective in response to, "Individually, how do you think you performed on this test?" and "Relative to other workers on Prolific, how do you think you performed on this test?" Higher numbers indicate stronger agreement or more favorable adjectives. Demographic controls include indicators for race, level of education, and attending high school in the US. Standard errors, shown in parentheses, are clustered at the worker level.

FIGURE 11. Stereotypes and Gender Differences in Self-Promotion by Treatment

A. Self-promotion (absolute)



B. Self-promotion (relative)



Note: This figure plots the gender gap in self-promotion separately for two treatments. Self-promotion (absolute) is a worker's strength of agreement to, "Individually, I performed well on the test". Self-promotion (relative) measures agreement with, "Relative to others, I performed well on the test". The sample contains 2,949 observations from both the *Private* and *Information* treatments. Error bars denote 95% confidence intervals.

6. Conclusion

> *Psychological attributes or non-cognitive skills comprise one of the newer explanations for gender differences in [labor market] outcomes.*
>
> Blau and Kahn (2017)
> The Gender Wage Gap: Extent, Trends, and Explanations

This paper highlights the role of stereotypes and beliefs in driving gender differences in an important labor outcome – qualitative descriptions or "self-promotion" of one's own skills and abilities. While there is substantial evidence documenting that men self-promote more than women in the labor market and in controlled laboratory settings, little is known about the drivers of this gender gap, and how we might address it.

My paper shows that gender stereotypes play a major role in explaining the gender gap in self-promotion. In a game of communication between "workers" and "employers" (Exley and Kessler 2022), I randomly assign workers to domains associated with a male or female stereotype. The experiment reveals that men self-promote than similarly-performing women in male-typed domains, in line with prior evidence from both laboratory and field settings. Starkly, however, this gender gap is symmetrically reversed in female-typed domains. In domains with a null measure of stereotype, I find no significant gender gap in self-promotion, at any level of test performance. This evidence implies that the traditional gender gap in self-promotion is driven not by gender per se, but by social stereotypes that cause men and women to behave differently. My paper further demonstrates that stereotypes create gender differences in beliefs about and interpretation of own performance, and these two factors in turn drive the gender gap in self-promotion.

There are three important takeaways from these results. First, they show that gender gaps in beliefs about own abilities lie at the heart of the gender gap in self-promotion. Therefore, gender-equity policies that urge women to *Lean In* in the labor market should particularly aim to increase women's beliefs and self-confidence. Second, however, this policy recommendation comes with a potential caveat. As shown by the Information Treatment in Section 5.3, it is challenging to change beliefs in stereotypical domains. Even if workers are given perfect feedback about their abilities, in male-typed occupations men are likely to update their beliefs more positively than women, thereby preserving and perpetuating the original gender gap in beliefs. Perhaps policies should also aim to reduce the strength or salience of stereotypes in decision-making in the workplace, such as through Unconscious Bias Training (Gino and Coffman 2021). Third, my findings

raise the possibility that beliefs and stereotypes might also explain gender gaps in other labor-market behavior. For example, a vast literature shows that women are less likely than men to enter competitive tournaments and to negotiate their wages, across field and laboratory settings (Niederle and Vesterlund 2007; Niederle 2017; Buser et al. 2014; Babcock and Laschever 2009; Recalde and Vesterlund 2023; Exley et al. 2020). Both these tasks require workers to form beliefs about their performance. In future work, therefore, I aim to study the role of stereotypes in driving gender differences in competitiveness and negotiation.

My results should also be interpreted in light of a few design constraints. Participants in my experiment describe performance anonymously to employers, in line with prior experimental designs where a worker's gender identity is not revealed to employers (Exley and Kessler 2022; Saccardo et al. 2024). In future work, therefore, it is important to study gender gaps in self-promotion in settings where employers know workers' gender identities. For example, conditional on seeing the same performance description by a male and female worker, are employers more likely to hire or reward male workers? Do workers anticipate potential gender discrimination by employers? Addressing these questions is important to understand whether men and women with similar performance, beliefs, and private evaluations of performance might face different *returns* to self-promotion. Again, experiments are useful to study these channels while shutting down the effect of stereotypes and other confounding factors. In an upcoming project, I examine gender differences in the returns to self-promotion using a gender-neutral (non-stereotypical) task which, by design, rules out gender differences in beliefs about performance.

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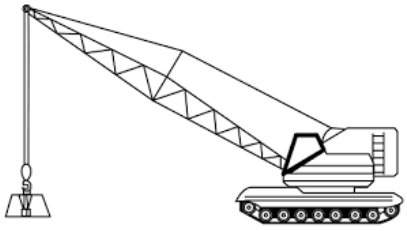
Appendix A. Experiment Interface

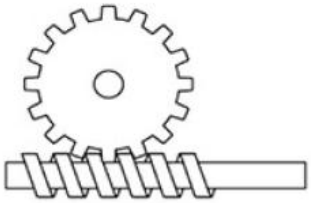
A.1. Worker Survey: Test Questions

Extending the reach of this crane will shift its...?



- Center of buoyancy
- Total weight
- Allowable speed
- Center of gravity
- Cannot be determined based on the given information

What type of gear arrangement is this?



- worm and wheel
- pivot
- rack and pinion
- spur
- bevel

FIGURE A1. Sample test questions in Mechanical Reasoning

A.2. Worker Survey: Self-promotion

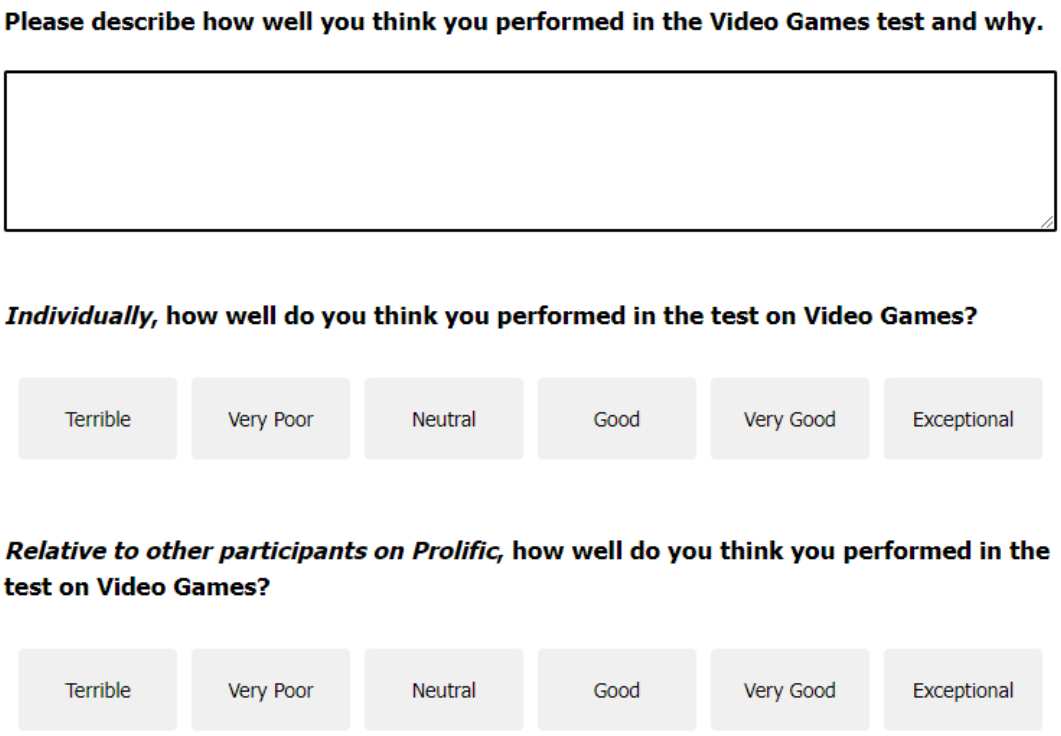


FIGURE A2. Measures of Self-Promotion

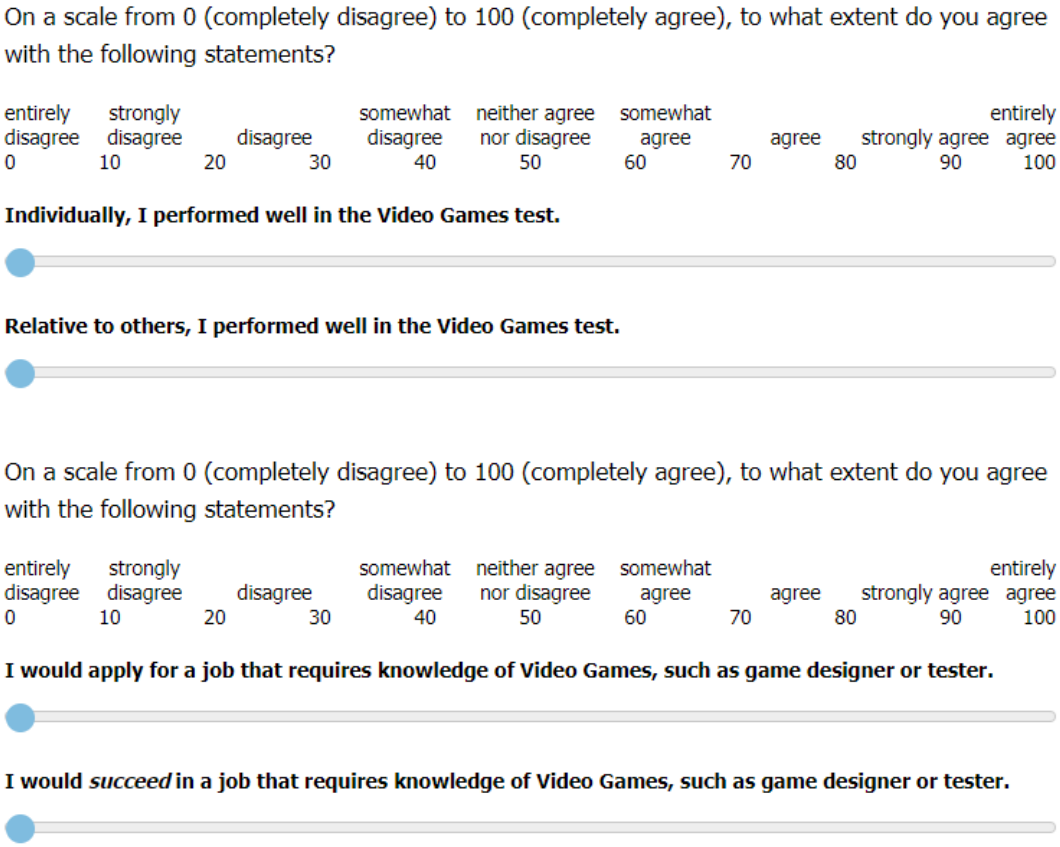
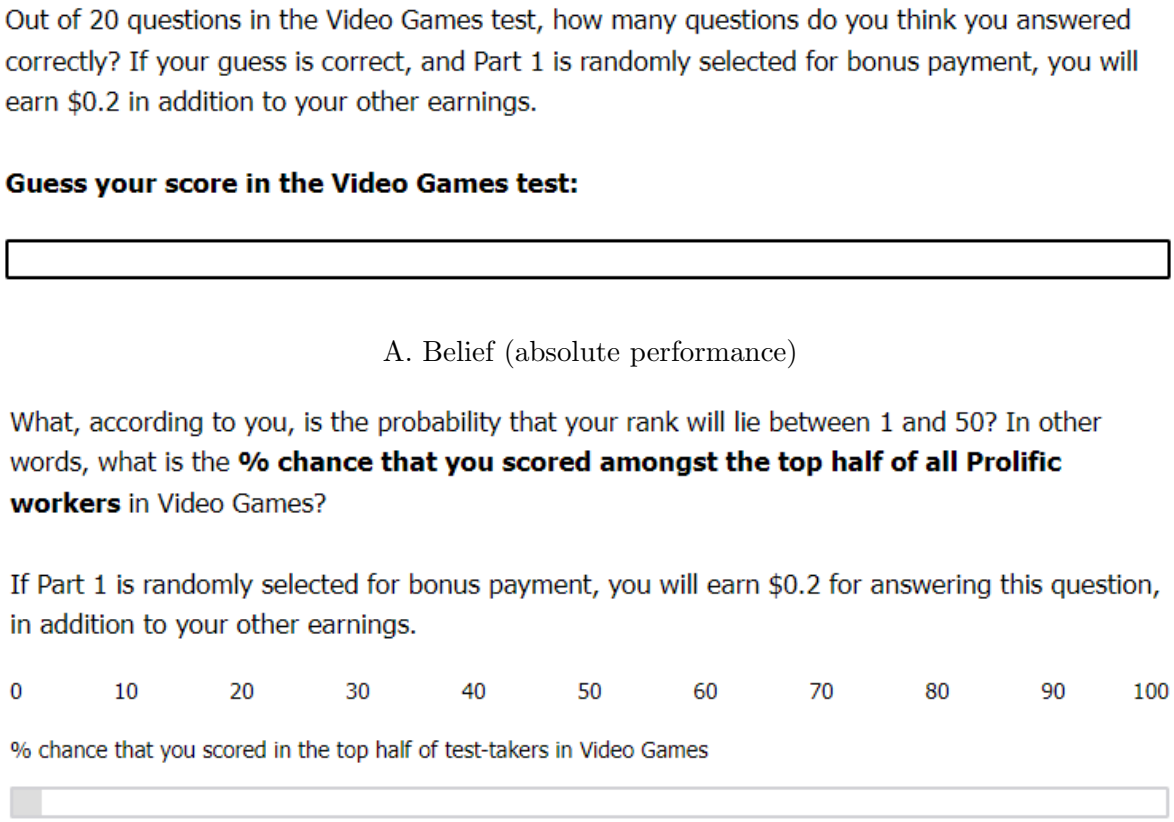


FIGURE A3. Measures of Self-Promotion

A.3. Worker Survey: Beliefs about own Performance



A. Belief (absolute performance)

B. Belief (relative performance)

FIGURE A4. Measures of Beliefs

A.4. Worker Survey: Perceived Gender Advantage

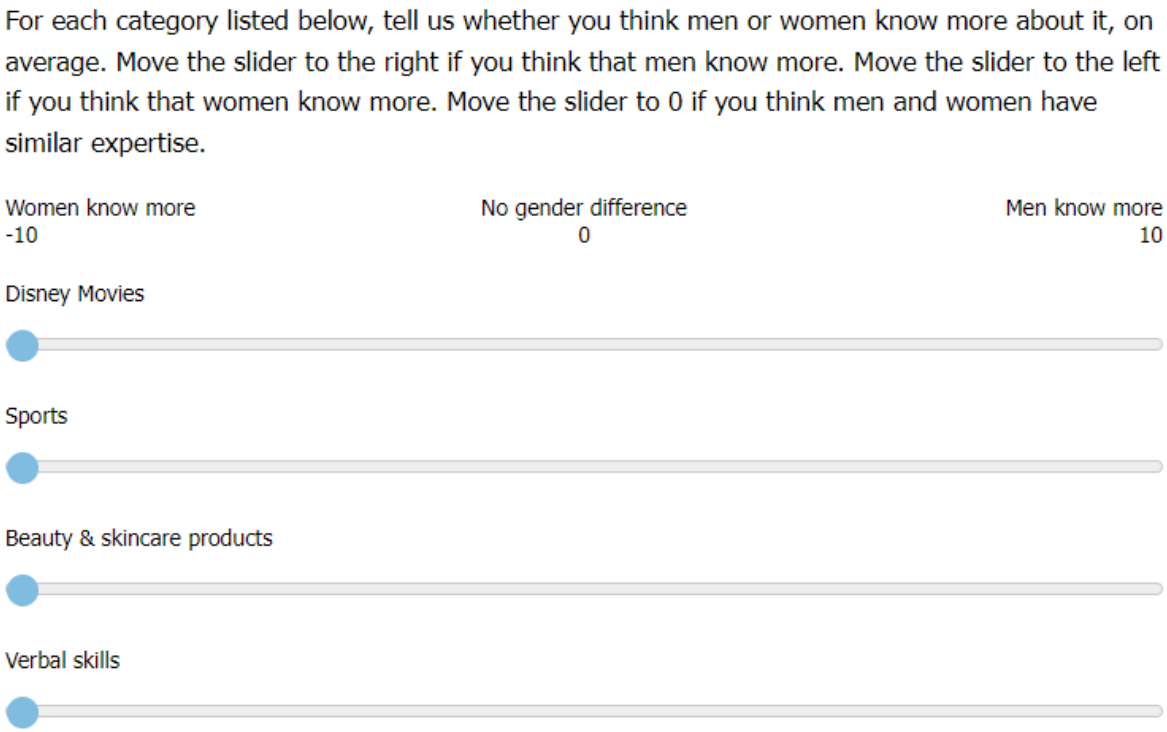


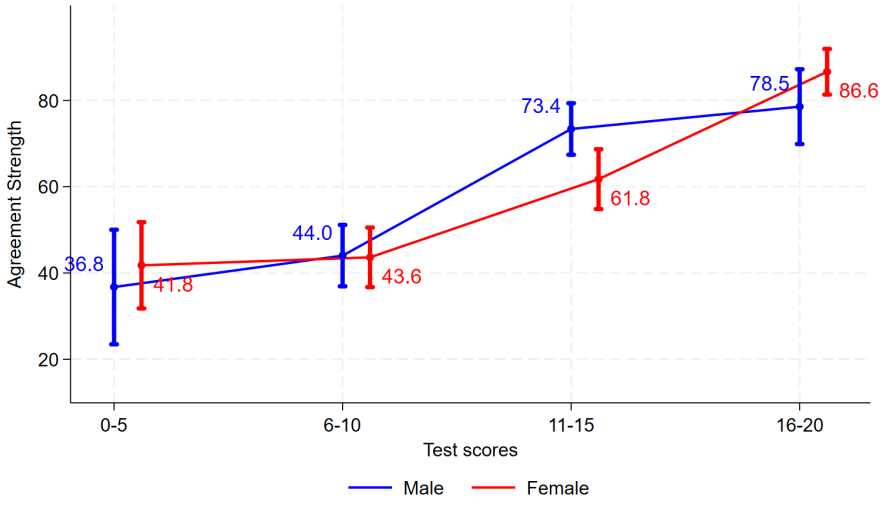
FIGURE A5. Perceived Gender Advantage

Appendix B. Additional Results

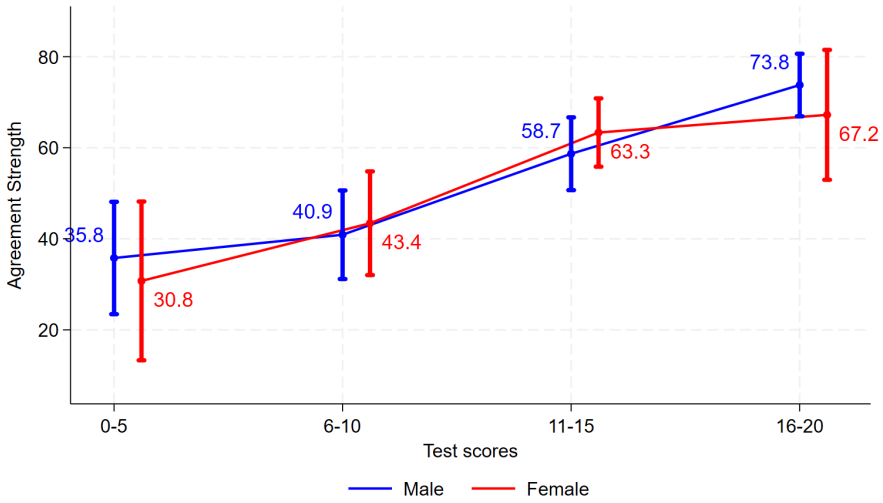
Paper	Measure of self-promotion	Study sample	Domain/ Task/ Occupation	Self-promotion (men–women)
Abraham (2023)	Rating own skills	Firm employees	Leadership, technical skills	0.05 sd ($p < 0.01$)
Bohnet et al. (2021)	Rating own work	Firm employees	Financial services	13 pp ($p < 0.01$)
Paustian-Underdahl et al. (2014)	Rating own skills	Firm employees	Leadership skills	
Lerchenmueller et al. (2019)	Using positive words in paper abstracts, titles	Researchers	Medicine	12.2% ($p < 0.05$)
Peng et al. (2022)	Publicizing own work	Researchers	Multiple fields	28 pp ($p < 0.01$)
Murciano-Goroff (2022)	Mentioning own skills on resume	Job candidates	Software programming	11.07% ($p < 0.01$)
Exley and Kessler (2022)	Rating own performance	Research participants, Middle-school students	Mathematics, Science sections in ASVAB	12 pp ($p < 0.01$)
Saccardo et al. (2024)	Rating own performance	Research participants, Middle-school students	Mathematics	12 pp ($p < 0.01$)
Abraham (2023)	Rating own skills	Firm employees	Teamwork, communication skills	-0.0954 sd ($p > 0.1$)
Exley and Kessler (2022)	Rating test performance	Research participants	Verbal skills	-1.15 pp ($p > 0.1$)

FIGURE A6. Self-promotion of Verbal skills

A. Baseline



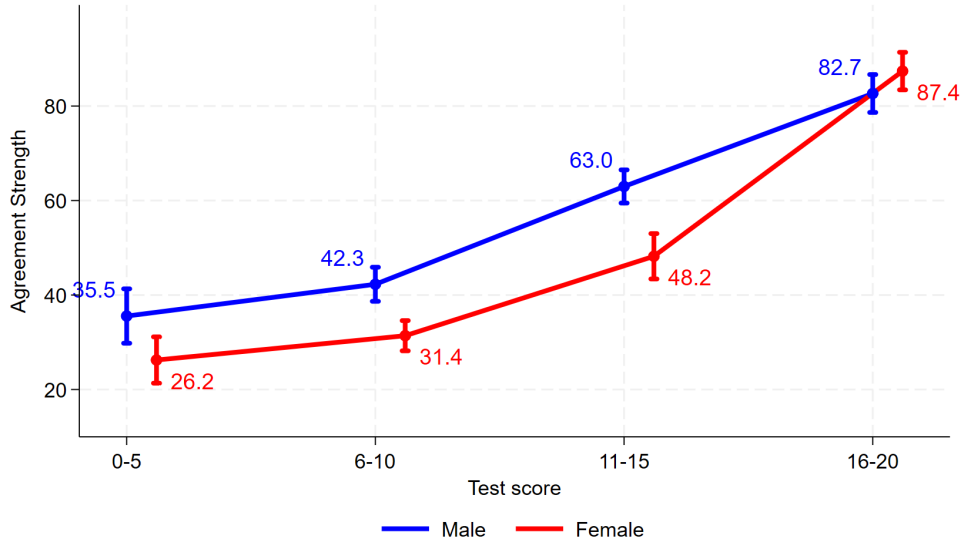
B. Private Treatment)



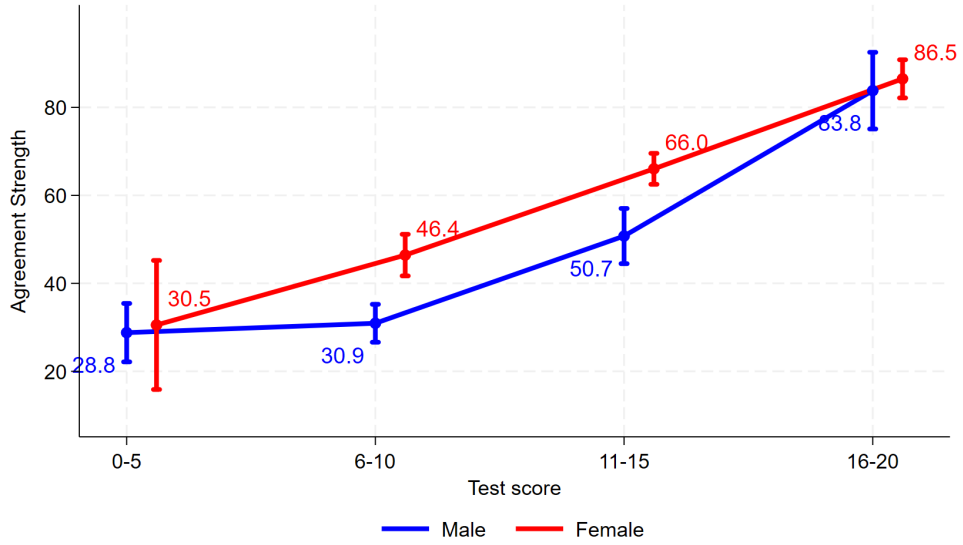
Note: Figure plots the mean of a worker's strength of agreement to the statement, "Individually, I performed well on this test" on a scale 0-100, specifically in the domain of verbal reasoning. In panel A6A data is restricted to the baseline experiment, where descriptions are shown to employers (N=195). In panel A6B data is restricted to Treatment 1, where there are no employers or strategic incentives for self-promotion (N=176).

FIGURE A7. Gender Differences in Self-Promotion by Domain

A. Male-typed domains



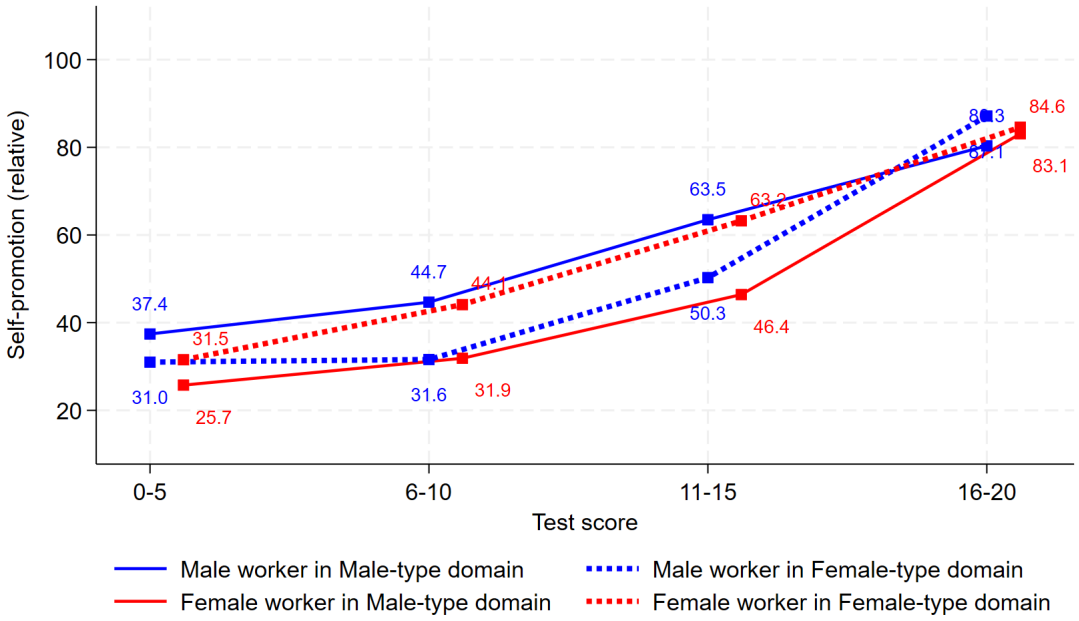
B. Female-typed domains



Note: This figure plots a worker's average strength of agreement on a scale of 0-100 to the statement, "Individually, I performed well on this test", separately for male and female workers, by raw test scores for each test category. Panel A7A includes data from five domains – Mechanical reasoning, Cars, Video games, Sports, Verbal – that are associated with a male advantage. Panel A7B includes data from three domains – Home economics, Beauty products, and Disney movies – that are associated with a female advantage. Error bars denote 90% confidence intervals. The sample contains 1,467 observations from the baseline experiment on self-promotion.

B.1. Stereotypes and Alternative Measures of Self-Promotion

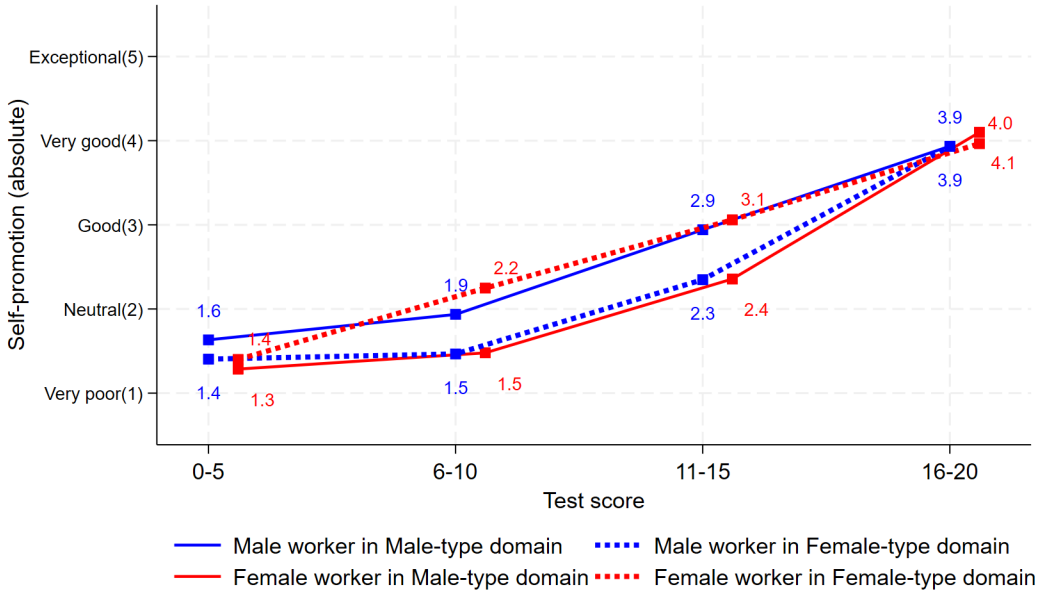
FIGURE A8. Stereotypes and Self-Promotion of Relative Performance



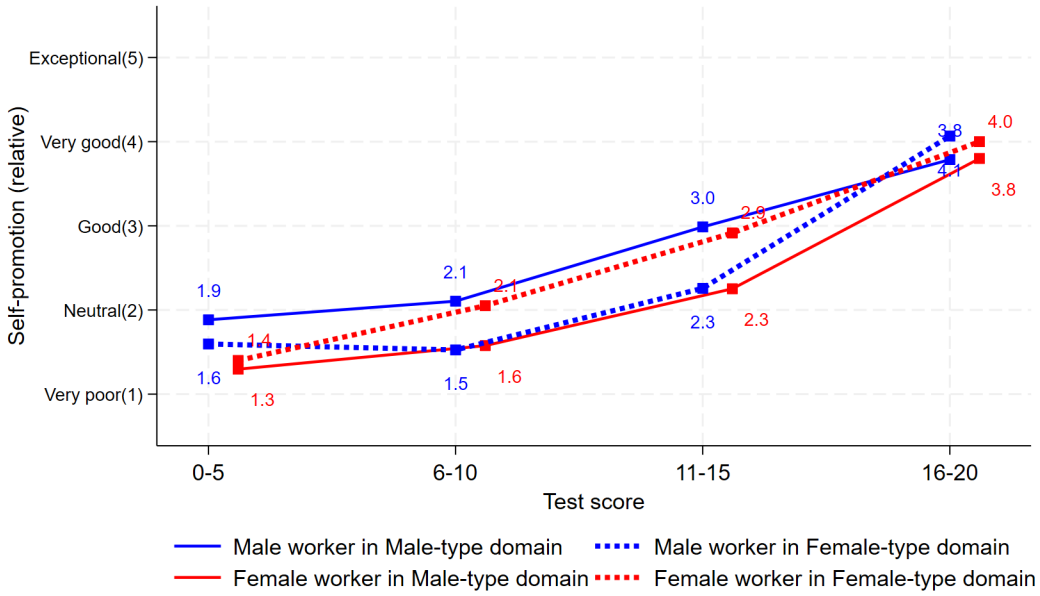
Note: In this figure, self-promotion (relative) is a worker's strength of agreement on a scale of 0-100 to the statement, "Relative to other workers, I performed well on this test". Blue lines represent male workers, while red lines represent female workers. Solid lines indicate male-typed domains (Mechanical reasoning, Cars, Video games, Sports, and Verbal) that are associated with a male advantage. Dashed lines represent female-typed domains (Home economics, Beauty products, and Disney movies) that are associated with a female advantage. The sample contains 1,467 observations from the baseline experiment.

FIGURE A9. Stereotypes and Self-Promotion (Adjectives)

A. Adjectives (absolute)



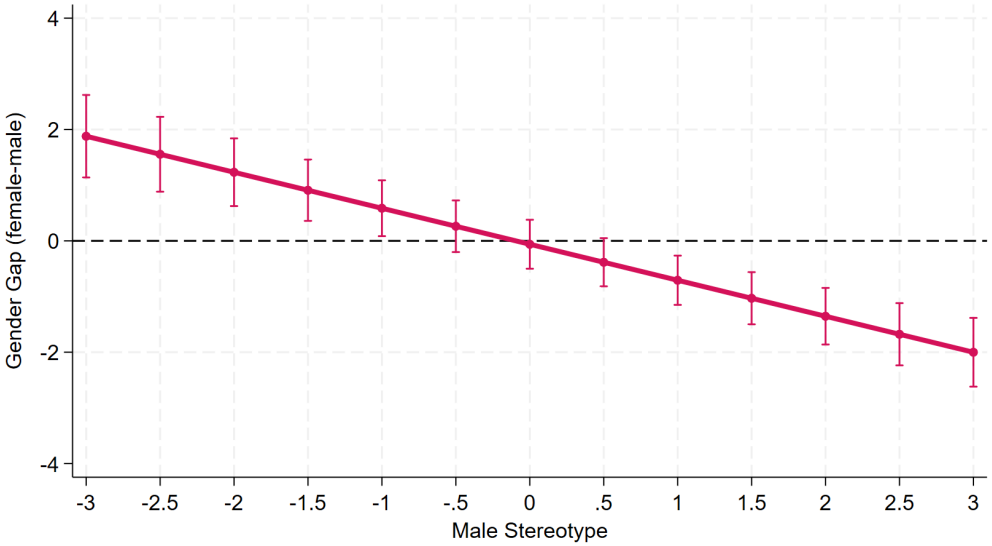
B. Adjectives (relative)



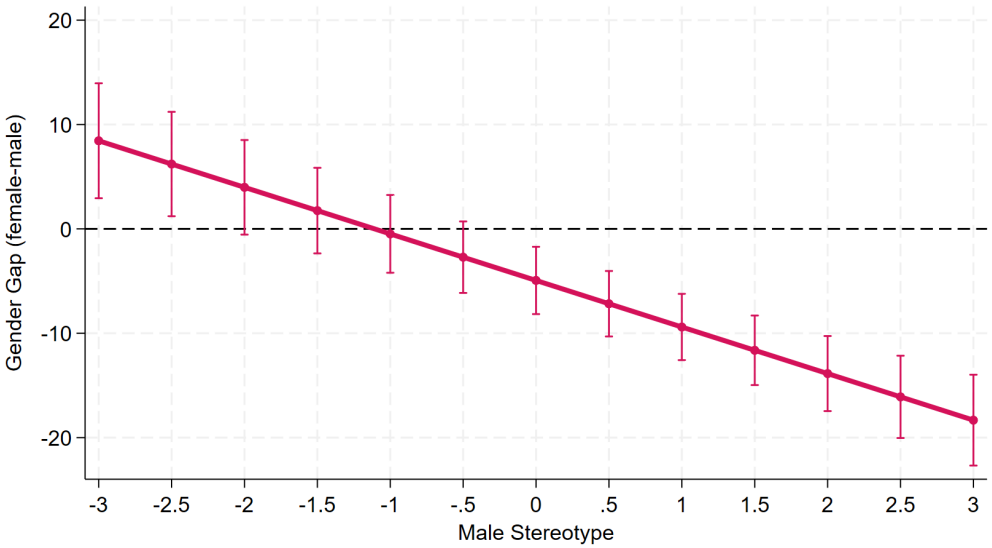
Note: This figure plots a worker's average strength of agreement on a scale of 0-100 to the statement, "Individually, I performed well on this test", separately for male and female workers, by raw test scores for each test category. The sample contains 1,467 observations from the baseline experiment on self-promotion.

FIGURE A10. Stereotypes and Gender Gaps in Beliefs

A. Gender Gaps in Beliefs (absolute)



B. Gender Gaps in Beliefs (relative)



Note: This figure plots the gender gap in self-promotion for a range of values of male stereotypes. The y-axis plots the difference between women's and men's self-promotion, represented by the coefficients $\beta_1 + \beta_3$ from equation (2). The x-axis plots a range of stereotypes, ranging from strongly female-typed (men's average performance is up to 3 points lower than women's) to strongly male-typed (men's average performance is up to 3 points higher than women's). Self-promotion (absolute) is a worker's strength of agreement to, "Individually, I performed well on this test". Self-promotion (relative) is their strength of agreement to, "Relative to other workers on Prolific, I performed well on this test". A higher number represents stronger agreement. Error bars denote 95% confidence intervals.

TABLE A1. Perceived Stereotypes and Gender Gaps in Self-promotion

	Agreement strength		Adjective strength	
	(absolute)	(relative)	(absolute)	(relative)
	(1)	(2)	(3)	(4)
Female	-0.00443	-0.0290*	0.00362	-0.0236
	(0.016)	(0.017)	(0.015)	(0.016)
1% Perceived male advantage	0.0621***	0.0615***	0.0513***	0.0566***
	(0.018)	(0.018)	(0.017)	(0.018)
Female x Perceived male advantage	-0.220***	-0.211***	-0.187***	-0.178***
	(0.026)	(0.026)	(0.024)	(0.025)
Constant	0.209**	0.213*	0.221*	0.189
	(0.102)	(0.118)	(0.127)	(0.117)
Gender gaps: (female-male)				
Perceived male advantage	-0.225***	-0.240***	-0.183***	-0.202***
	(0.030)	(0.030)	(0.028)	(0.029)
Performance fixed effects	✓	✓	✓	✓
Demographic controls	✓	✓	✓	✓
Observations	1467	1467	1467	1467

Note: This table presents estimates from equation (2). *Perceived Male advantage* denotes the magnitude by which men are perceived to perform better than women in a test domain. Agreement (absolute) in column (1) is a worker's strength of agreement to the statement, "Individually, I performed well on this test". Agreement (relative) in column (2) is a worker's strength of agreement to, "Relative to other workers on Prolific, I performed well on this test". Columns (3) and (4) denote the strength of adjectives chosen by workers in response to, "Individually, how do you think you performed on this test?" and "Relative to other workers on Prolific, how do you think you performed on this test?" Higher numbers indicate stronger agreement or more favorable adjectives. All outcomes are re-scaled to the interval [0,1] so that coefficients can be interpreted in percentage points. Performance fixed effects are dummies for each possible raw score on the test. Demographic controls include age, race, level of education, and an indicator for attending high school in the US. Standard errors, shown in parentheses, are clustered at the worker level.

B.2. Self-promotion as free-form text descriptions

The experiment also asks workers to describe their test performance using free-form descriptions and adjectives. The free-form question asks: "Please describe how well you think you performed in this test". I utilize methods from Natural Language Processing to classify the sentiments embedded in a worker's free-form description (Mao et al. 2024). Specifically, I classify whether a text description contains a positive sentiment or a negative sentiment, using a standard model of language classification built by Google. Table A2 shows examples of sentiment classifications for anonymized free-form descriptions in the worker survey.

TABLE A2. Sentiments of free-form descriptions

Free-form self-promotion	**Sentiment**
"i did terrible. im not a girl so i dont know anything about beauty products."	Negative
"I think I did bad. I do not know much about makeup, so this topic was out of my range."	Negative
"Not that well. I had to guess on a good bit of them because I am not familiar with that catagory."	Positive
"I love beauty and skincare, so I know this stuff inside and out."	Positive

Note: This table presents examples of free-form textual descriptions of performance and the corresponding sentiments associated with each description. A higher sentiment score indicates a more positive sentiment associated with the text. Sentiments were computed using BERT, a deep learning language model created by Google.

B.3. Model of stereotype-driven beliefs

Formally, Bordalo et al. (2019) use stereotypes to model beliefs about an individual's "type" as follows. Consider a binary type (J) such as being amongst the top half of performers (above-median) in a mathematical task, and two groups of individuals for whom one may form beliefs about being of this type: males (M) and females (F). Further, assume that in the population of all males and females, being above-median in math (p_J) is more *representative* for a male than being below-median in math $(p_{\neg J})$:

$$\frac{p_{M,J}}{p_{F,J}} > \frac{p_{M,\neg J}}{p_{F,\neg J}} \iff p_{M,J} > p_{F,J}$$

Then, according to the stereotype theory of belief-formation, an individual's *belief* that a male is of type j (above-median in math) will be an exaggeration of the true representativeness of men among that type:

$$p_{M,J}^{belief} = p_{M,J}\left(\frac{p_{M,J}}{p_{F,J}}\right)^{\theta}\frac{1}{z_{M,J}}$$

where $\theta \geq 0$ captures the extent to which beliefs about the event are distorted by the true relative likelihood of that event. Given the normalization factor $z_{M,J}$, and assuming that $p_{M,J}$ is sufficiently close to $p_{F,J}$, the above relationship approximates to the following linear model that can be estimated empirically:

$$p_{M,J}^{belief} = p_{M,J} + \theta(p_{M,J} - p_{F,J}) \tag{A1}$$