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Abstract

We study how peer beliefs shape individual attitudes toward maternal labor supply using realistic hypothetical scenarios that elicit recommendations on the labor supply choices of a mother with a young child and an information treatment embedded within representative surveys. Across the scenarios, we find that individuals systematically overestimate the extent of gender conservativeness among the people around them. Exposure to information on peer beliefs leads to a shift in recommendations, driven largely by information-based belief updating. The information treatment also increases (intended and actual) donations to a nonprofit organization advocating for women in the workplace.

Key words: expectations, social norms, information treatment

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1 Introduction

The converging roles of women and men in the labor market is one of the most significant economic and social development of the past century. Nevertheless, gender equality in labor market outcomes has remained elusive, even for the most developed economies in the world. A growing literature emphasizes the role of children, documenting a sharp divergence in labor market trajectories with the onset of children, driven by women’s universally dominant role in childcare and non-market work (e.g. Angelov et al., 2016; Kleven et al., 2019; Cortés and Pan, forthcoming). Why is it that women remain the main providers of childcare even as their economic roles have converged to that of men’s?

A natural explanation is the persistence of gender norms that constrain women’s behavior. Indeed, there is increasing recognition of the importance of gender norms in determining women’s labor force participation and career decisions, over and above traditional economic factors such as human capital accumulation, comparative advantage, and discrimination.¹ Yet, we know much less about how these norms are formed and perpetuated, especially in a developed country context. It is puzzling that gender norms remain persistent even in the face of market forces that are making these norms increasingly costly.

In this paper, we examine the role of misperceptions and information gaps in contributing to the stickiness of gender norms in the context of the U.S. We study opinions regarding the labor supply decisions of mothers using hypothetical scenarios presented to a representative sample of respondents drawn from the New York Fed’s Survey of Consumer Expectations (SCE). The scenarios specifically ask respondents about (1) their own recommendation (first-order beliefs) and their perceptions of the recommendations of those living in the same part of the country as them (second-order beliefs) about whether a mother with a young child should accept a job offer to return to work (and send the child to a free, high-quality preschool), as well as (2) whether a wife, as opposed to the husband, should take time off from work to care for her young child (for a specified relative earnings differential between the husband and the wife) if a child care option is not available. We present respondents with vignettes that are quite specific, with the intention of eliciting beliefs over a set of realistic scenarios that respondents are likely to encounter. This is in contrast to previous studies that tend to focus on more general perceptions about whether women should work (e.g. Bursztyn et al., 2020 and Grewenig et al., 2020). Our view is that providing specifics about the hypothetical situation is important in a developed country context such as the U.S. where the prevailing gender norm is less about whether a women should be allowed to work, but rather the situations where it is appropriate for her to work or change her labor supply.

We find substantial heterogeneity in respondents’ first-order beliefs (i.e., their own recommen-

¹See Bertrand (2018) and Cortés and Pan (forthcoming) for a review of the related literature in developed countries and Jayachandran (2015) for developing countries.

dations), with average first-order beliefs varying systematically with the average gender norms of the state as proxied by a battery of questions adapted from the General Social Survey (GSS). Specifically, states with a higher average recommendation that the mother reject a job offer to return to work tend to rank lower in terms of the progressivity of gender-role attitudes as measured in the GSS (see Appendix Figure A.1). Importantly, there is also considerable heterogeneity in first-order beliefs within states. Whether individuals are systematically misinformed about gender attitudes of people around them, and whether individuals take into account these perceived norms when making decisions, is what we set out to investigate in this paper.

We find that average first-order beliefs (i.e., respondents' own recommendation) are significantly more progressive than what they think others would recommend (second-order beliefs). That is, a large majority of respondents tend to think that others around them have less progressive gender attitudes than themselves. Looking more specifically at how individuals' second-order beliefs compare with the reported views of his/her peers (i.e. those of the same gender residing in the same state), we find that in most scenarios, more than half of the respondents overestimate how conservative their peers are. Such misperceptions in gender norms are similarly large for both genders.

Given these apparent misperceptions in gender norms, we then turn to the question of whether and how correcting these beliefs affects individuals' first-order beliefs about women's labor supply. For each scenario, we first elicit respondents' second-order beliefs before randomly providing half of the sample with information on the average response of their peers from an earlier survey wave. Those in the control group were not provided with any information. Respondents in both groups were then asked about their first-order beliefs – that is, what they would recommend that the mother do in that scenario. Further, to move beyond self-reported beliefs, we also examine whether the information treatment affects an incentivized measure of support for female empowerment in the workforce, as proxied by respondents' donations to a non-profit organization that advocates for women in the workplace.

We find, in the first scenario about whether the respondent would recommend that a mother with a 4-year-old reject an attractive job offer to return to work and stay home with the child, that respondents who received information about peers' recommendations were slightly less likely to recommend that the mother reject the job offer. For the second set of scenarios where we vary the relative earnings differentials within the household and ask about their opinion as to whether the mother (rather than the father) should take time off to help with childcare, the estimated treatment effects vary by the relative earnings of spouses. In situations where the wife earns the same or less than her husband, those receiving the information were significantly more likely to recommend that the mother take time off than the control group. This pattern is reversed in situations where the wife outearns her husband. We also find that the information treatment leads to a significant increase in (intended as well as actual) donations to the non-profit organization that advocates for

women in the workplace. These impacts on donations, however, are only observed for our male respondents.

Finally, we investigate the mechanisms underlying the observed treatment effects. In particular, we identify the importance of the information (or de-biasing) channel by examining heterogeneity in treatment effects as a function of the initial gaps in perceptions of peers' beliefs. If the treatment affects individuals' own attitudes by de-biasing initial misperceptions, we would expect shifts in attitudes that correlate with the direction and size of the perception gap, defined as the individuals' second-order belief minus the "truth" (i.e., the actual average for people of the same gender and in the same state). Across the scenarios, we find strong evidence that both genders respond to the informational content of the treatment. However, some men also appear to be responding to the increased salience of the norm in the first scenario.

These findings suggest that misperceptions regarding the support for mothers' participation in the labor market contributes to the perpetuation of gender norms even in a country like the U.S. where women's labor market potential is now similar to that of men's. The presence of such information gaps can also help to rationalize why norms remain sticky even as they become increasingly costly to maintain. Nevertheless, our results highlight that the simple act of providing information can change individual beliefs and attitudes, thus speeding up the evolution of norms.

Our study is similar in spirit to earlier work by Bursztyn et al. (2020), who document widespread misperceptions among young married men in Saudi Arabia in the level of support for women working outside their home by their peers. The authors show that experimentally correcting these beliefs increases the willingness of men to allow their wives to participate in the labor force. Our focus is instead on a developed country context where the economic and social environment is much more gender-equal and the prevailing norm is less extreme. In addition, we utilize a richer set of scenarios to examine the relevance of information gaps in various household situations (e.g. as a function of the relative earnings of spouses) and analyze the potential mechanisms through which information provision shapes individual beliefs.

Our paper is related to two main strands of literature on gender norms. The first examines the relationship between gender norms and women's economic outcomes. Papers in this stream have demonstrated how cultural norms in one's country of origin affect the labor market behavior of first- and second-generation immigrant women (Antecol, 2000; Blau et al., 2011; Blau et al., 2013; Fernandez and Fogli, 2009) and how gender norms and identity considerations affect women's (relative) labor market and household outcomes (Bertrand et al., 2015; Bursztyn et al., 2017; Ichino et al., 2022). A related strand of literature focuses on what drives the formation and evolution of these norms. Several papers emphasize the historical origins of gender norms, and show how cultural persistence can lead to the stickiness of norms over long periods of time (e.g. Alesina et al., 2013; Hansen et al., 2015). Nevertheless, the political environment (Campa and Serafinelli, 2019; Senik et al., 2020), family-based influences (Cools and Patacchini, 2019; Brenøe, forthcoming), and an

individual’s broader social network (e.g. peers with working mothers and neighbors) (Olivetti et al., 2020; Maurin and Moschion, 2009) have also been shown to matter for shaping gender-role attitudes and women’s behavior. We complement this work by exploiting substantial variation in gender norms *within* the United States. To our knowledge, such variation remains under-exploited; Charles et al. (2018) and Kleven (2022) are among the few papers that exploit geographic variation in norms in the United States.

2 Data

Our experiment was embedded in selected months of the 2020 and 2021 Survey of Consumer Expectations (SCE) run by the Federal Reserve Bank of New York. The SCE is an internet-based survey of a rotating panel of about 1,300 household heads from across the U.S. Respondents participate in the panel for up to twelve months, with a roughly equal number rotating in and out of the panel each month. The SCE collects standard demographic and economic information about participants along with data on subjective expectations. Our module added a set of standard questions on gender norms from the General Social Survey (GSS) and other questions to elicit individual-level attitudes and perceived norms regarding women’s labor supply as described below.

2.1 Study Design

2.1.1 Perceived Norms

Our main measures of individual attitudes and perceived norms toward working women are based on questions related to two hypothetical scenarios, both of which involve a mother’s choice between rejecting a job/taking some time off work to care for her four-year-old child and accepting a job/not taking time off. The first scenario is the following:

Scenario 1

“A household living in your area has a child that is 4 years old. The father of the child works, and the mother has stayed home with the child since the child’s birth. The mother has received a job offer that she likes and pays well, and she is considering whether she should accept the offer. She has two options: (1) Reject the job offer and continue to stay home with the child, and (2) Accept the job offer and send the child to a high-quality public pre-Kindergarten (which is free).”

Survey participants were then told: *“We had asked other people living in your state/part of the country for what advice they would give to the mother – specifically, we asked them for the percent chance (or chances out of 100) that they would recommend the first option, that is, the mother reject the job offer and continue staying home with the child. On average, what do you think is the percent chance that other [females/males] living in your state/part of the country recommended*

that the mother reject the job offer and continue staying home with the child? Please respond on a 0-100 scale”

This is what we refer to as a respondent’s *second-order* belief, that is, their perception about how other women/men around them answer this question.

The second scenario is as follows:

Scenario 2

“Now consider the same situation as before: A household living in your area has a child that is 4 years old. The father of the child works, and the mother has accepted the job offer that she likes and pays well. However, a month into both the father and mother working, they realize that the childcare option is not of good quality, and so one of the spouses should take some time off work each week to help with childcare for at least a year. The annual earnings of the spouse who takes time off would be cut in proportion to the reduction in the hours. Both spouses can return to their jobs full-time after taking time-off.”

Just as for scenario 1, participants were then told: “*We had asked other people living in your state/part of the country for the percent chance that they would recommend the wife take some time off from her job each week for a year to take care of the 4-year-old child (as opposed to the husband taking time off his job). On average, what do you think is the percent chance that other [females/males] living in your state/part of the country recommended the wife take some time off from her job each week for a year to take care of the 4-year-old child if the wife earns [X] than the husband?*”, where $X = \{15\% \text{ less, the same, } 15\% \text{ more, } 30\% \text{ more, } 50\% \text{ more}\}$.

2.1.2 Individual Attitudes and Experiment

After eliciting the respondents’ second-order beliefs, we then move on to eliciting their own recommendation, or what we refer to as the respondent’s *first-order* beliefs. For example, for Scenario 1, respondents are asked: “*What advice would you give the mother – specifically, what is the percent chance (or chances out of 100) that you would recommend the first option, that is, the mother reject the job offer and continue staying home with the child?*” For the second scenario, we ask about “*...the percent chance that you recommend the wife take some time off from her job each week for a year to take care of the 4-year-old child (as opposed to the husband taking time off from his job)?*” Note that first-order beliefs are elicited on a probabilistic scale. This is because the scenarios are incomplete, and hence we allow the respondent to express uncertainty in their recommendation.

The experimental variation is introduced as follows: a randomly selected half of the sample are given information about the average recommendation to each of the hypothetical scenarios of individuals of the same gender and residing in the same state *after* they have stated their second-order beliefs but *before* they state their first-order beliefs. Thus, we use a between-subject design, which arguably mutes the impacts of the information treatment (Fuster and Zafar, 2022).

2.2 Administration

Our experiment was embedded in the July 2020, March 2021, and September 2021 waves of the SCE. We complement these surveys with an additional survey conducted in October 2021 using the respondents who rotated out of the SCE.²

The information we provide to the respondents comes from the March 2020 sample, which we use to compute average responses by gender and state. For example, for Scenario 1, treated respondents were told: *“Before you report your answer, let us tell you what other respondents have been saying. The average percent chance that other [females/males] living in your state/part of the country recommended that the mother reject the job offer and continue staying home with the child was [Y]%. ”* Respondents were informed about their own-gender average response only.³ Note that the information treatment is at the individual level and, conditional on being in the treatment group, a respondent receives the information for both scenarios if applicable (including for each of the relative earnings situations in the second scenario).

Before we move to the analysis of the data, it is worth noting that the underlying data exhibits sensible patterns. In Appendix Table A.2, we show that the responses to our first scenario are highly correlated with answers to the gender norm questions that we adapted from the GSS. Appendix Figure A.1 further suggests that the ranking of a state based on a gender conservatism index constructed using GSS questions is highly predictive of the average response to our hypothetical scenario question in that state. For example, the average first-order belief in Vermont, a state that scores low on the gender conservatism index, is 14.4%, and in Alabama – a state that scores high on the index – is 33.1%.

We chose not to incentivize the elicitation of second-order beliefs, since there is little evidence that incentives matter for recovering the true underlying beliefs (Haaland et al., 2021; Fuster and Zafar, 2022). However, as a robustness, in the final October 2021 wave, we incentivized the elicitation of the second-order beliefs for Scenario 1.⁴ Reassuringly, we find that the belief

²Descriptive statistics and a comparison of our sample with household heads in the (July 2020 - November 2021) Current Population Survey (CPS) is presented in Appendix Table A.1. Compared to the CPS, our sample is younger, more educated, has higher income, and higher levels of marriage and employment. This positive selection should arguably bias us *against* finding a role for information frictions in gender role perceptions.

³We implemented this information experiment in the July 2020; March, September and October 2021 surveys. In the March 2020 survey, respondents were first asked for their first-order beliefs for the two scenarios, followed by the second-order beliefs. This order was reversed in later surveys to be able to see the impact of the information treatment on first-order beliefs. Due to survey space constraints, respondents were asked either Scenario 1 or Scenario 2 (first- as well as second- order) beliefs in the March 2021 and September 2021 surveys. In the other two surveys, respondents reported beliefs for both scenarios. Half of the eligible respondents received the information treatment in each case. Appendix Table A.3 shows that covariates including demographic characteristics and baseline gender attitudes are balanced across treatment and control groups.

⁴In this wave, respondents were told: *“We will ask you about how other people answered this question. Please answer carefully since we will then reward two people with the guess closest to the truth with \$10 (ties will be broken randomly). You will be informed if you are the winner a month from now.”* We then calculated the distance between the second-order beliefs and the truth for each respondent and picked the two respondents with the smallest distance.

distribution is largely similar to that in the other waves when no incentives were offered.

3 Data Analysis and Results

3.1 Descriptive Statistics on First- and Second-Order Beliefs

Table 1 summarizes the responses to the hypothetical scenarios for the control group. Each column corresponds to a question, and we report averages and standard deviations for first-order beliefs, second-order beliefs, the comparison between the two, and statistics on the perception gap (i.e., the difference between the respondents’ second-order beliefs and the “truth,” (i.e., the actual average for people of the same gender and in the same state across *all* survey waves). A few observations stand out. First, the average percent chance that a respondent recommends that a stay-at-home mother reject a job offer, even when the child can attend a high-quality public preschool for free, is 31%. As expected, the average percent chance that a respondent recommends that the mother (instead of the father) take time off to take care of their four-year-old child decreases as the relative earnings of the mother (with respect to the father) increase, from 59% when the mother earns 15 percent less to 16.2% when she earns 50% more. Regarding second-order beliefs, the averages are higher than first-order beliefs in all cases, suggesting that most respondents think that others around them have less progressive gender attitudes than themselves.

To study misinformation more directly, we compare an individual’s second-order beliefs with the average first-order beliefs of people of her gender and in her state (peers). We observe that in most scenarios, more than half of the respondents overestimate how conservative their peers are. For example, in the scenario where a stay-at-home mother should decide whether to reject a job offer, 62% of respondents’ have second-order beliefs that are higher than the truth (the p -value for the test that the share is significantly different from 0.5 is close to zero for all the cases up until the mother earns 30% more than her husband). The only case in which the majority of respondents underestimate the conservatism of peers is when the mother earns 50% more than her husband. In this case, 40% of respondents have second-order beliefs that are higher than the truth.

The gender differences in the responses are presented in Appendix Table A.4. As reported in previous work (e.g. Charles et al., 2018; Kuziemko et al., 2020) we find that men, on average, hold less progressive gender attitudes than women. Relative to women, men are also more likely to consider themselves less conservative than their peers (i.e. they are more likely to report second-order beliefs that are greater than their own first-order beliefs) and are more likely to overestimate how gender-conservative their peers are.

3.2 Treatment Effects on Perceptions

The biases in individual beliefs about peers’ attitudes toward mothers’ labor supply suggest a potential role for information provision to correct these misperceptions. In this section, we report the baseline treatment effects of our information experiment on individuals’ own attitudes (i.e. first-order beliefs). Recall that in the experiment, treated respondents’ second-order beliefs are elicited before they are provided with information about their peers’ responses (from an earlier survey wave)⁵ and the first-order beliefs for the treatment group are elicited after the information treatment. Figure 1 presents the average first-order beliefs by treatment status, and the p -value for the test of equality of means. For the first scenario about whether a mother with a young child should reject an attractive job offer to return to work, we find that respondents who received the information were less likely to recommend that the mother reject the offer, but the raw difference is marginally insignificant with a p -value of 0.12.

Turning to the second set of scenarios where we vary the relative earnings within the household and ask respondents about their opinion as to whether the mother (as opposed to the father) should take time off from work to help alleviate childcare needs, the estimated treatment effects vary by the relative earnings of spouses. In situations where the mother earns the same or less than the father, information provision shifts first-order beliefs in a less progressive direction, with treated respondents significantly more likely, on average, to recommend that the mother take time off than the control group. Interestingly, this pattern is reversed in scenarios where the wife earns more than the husband, with treated respondents up to 2.6 percentage points (16%, $p < 0.01$) less likely, on average, to recommend that the mother should take time off in the case where the wife earns 50% more. We will further investigate these patterns and offer a potential rationalization of the observed asymmetry of the treatment effects in the next section.

A natural question is whether the impact of information provision differs by gender. Figure A.2 presents the first-order beliefs by gender and treatment status. We see that treatment effects go in the same direction for men and women in all scenarios, and that the magnitude of these effects are generally larger for men, with the difference across genders being particularly large for the scenario where the mother makes less than her partner.⁶

3.2.1 Underlying Mechanisms

The baseline treatment effects suggest that individuals’ perceptions of the prevailing social norm affect own beliefs about maternal labor supply. How exactly is this information on the prevailing

⁵It is for this reason that the second-order beliefs reported in Appendix Table A.3 are largely balanced by treatment status.

⁶Appendix Table A.5 shows that the main results that we discuss so far are robust to including survey fixed effects and demographic controls such as the age and household income of the respondent, as well as dummies for gender, race, having a college degree, presence of children younger than 6 and younger than 18 in the household, and working full-time.

social norm shifting individuals' beliefs? Is it through correcting misperceptions of the social norm via an information channel or perhaps through a salience channel by highlighting others' views surrounding this specific norm?⁷

We begin our examination of the relevance of the information channel by examining the correlation between individuals' first-order and second-order beliefs for the control group. Figure 2 presents a binned scatterplot of the relationship between first-order and second-order beliefs using data from the first scenario (the percent chance of recommending that the mother stay home with the young child) and the second scenario (the percent chance of recommending that the mother instead of the father takes time off to care for her young child) for the case in which the mother earns 15% more than her husband. Consistent with the idea that perceptions of the social norm matter for individual attitudes, for both scenarios, we observe a strong and statistically significant positive relationship between first- and second-order beliefs – individuals who believe that their peers hold less progressive attitudes tend to hold less progressive views themselves. Furthermore, most observations are below the 45 degree line, implying that, as discussed before, most people believe peers are more conservative than themselves.

To explore the role of information-based belief updating as a mechanism more systematically, we estimate treatment effects by the size and sign of the perception gap (i.e the difference between second-order beliefs and the truth). Our hypothesis is that if respondents learn their peers are more conservative than they thought they were (negative perception gap), we expect them to update their beliefs upwards and give a more conservative recommendation (positive treatment effect). If their beliefs about others are quite accurate (perception gap close to zero), and the main mechanism is belief-updating, then the treatment effect should be small. Finally, if they learn through our treatment that peers are more progressive than they thought (positive perception gap), they might revise their first-order beliefs downwards (become more progressive themselves). To test this hypothesis in a simple way, we divide respondents into three groups for each question: (1) the bottom quartile of the perception gap distribution (the average perception gap is negative), (2) middle 50%, and (3) top quartile of the perception gap distribution (the average perception gap is positive).⁸ We then estimate treatment effects for each of the three groups, separately for each hypothetical scenario.

The results from this exercise are presented in Figure 3. Panel A shows that for the question of the percent chance that the person will recommend that a stay-at-home mom reject a job offer, there is a statistically significant treatment effect, but only for those in the top quartile of the perception

⁷See Fuster and Zafar (2022) for relevant discussion.

⁸We chose this classification because the signs of average perception gaps are consistent across all questions and relative earnings scenarios. The magnitude of the average perception gap by group, however, varies by question. For example, the average perception gap for the bottom quartile varies from -53 percentage points for the recommendation that the mother take time off from work if she earns 15% less than her husband to -20 percentage points for the recommendation to reject the job offer. Note that the average perception gap for the middle 50% is sometimes positive and sometimes negative, but always quite small.

gap distribution (that is, those who under-estimate the progressivity of their peers). The direction of the treatment effect is consistent with information-based belief updating – learning that peers are less conservative than previously thought makes first-order beliefs more progressive, leading to downward revisions. Panel B presents the estimates for the five different relative earnings scenarios. Here, two main observations stand out. First, treatment effects tend to go in the expected direction across all relative earnings scenarios: positive or close to zero at the bottom of the perception gap distributions, small and close to zero for individuals with small perception gaps, and negative or close to zero at the top of the distribution, where the average perception gaps are positive.⁹ Second, statistically significant and sizeable treatment effects are observed in opposite ends of the perception gap distribution depending on whether the mother makes at most the same, or more than her husband. We find positive revisions, on average, for people with negative perception gaps (that is, those who under-estimate the extent of conservatism of their peers) when the mother makes at most the same as her husband, and negative average effects for people with positive perception gaps when the mother makes more than her husband.

One explanation, albeit a speculative one, behind this pattern might be that individuals are more likely to adjust their recommendations when the scenarios are such that the economic rationale reinforces the shift in beliefs. As suggested by Figure 2, individuals with negative perception gaps tend to be more progressive, while those with positive perception gaps more conservative.¹⁰ Faced with evidence that people around them are less progressive than they thought, more progressive individuals (e.g. those with negative perception gaps) might be more inclined to shift their beliefs in a more conservative direction especially in situations where the mother earns less than her spouse – that is, in the case where the economic rationale (mother earns less) is in line with the direction of the shift in beliefs (towards recommending that the mother reduces her labor supply). Similarly, when told that people around them are more progressive than previously thought, less progressive individuals (e.g. those with positive perception gaps) may be more inclined to shift to a more progressive recommendation (against the mother taking time off for child care) in situations where the the economic rationale would push in the same direction as the shift in beliefs, that is, in the scenario where the mother earns more.

In short, the main channel that seems to lead to the observed revisions in first-order beliefs is one of de-biasing. When we investigate the prominence of this channel by gender in Figure A.3, we find that for the first scenario, consistent with belief-updating, the treatment effects are largest for individuals at the top of the perception gap distribution (where average perception gaps are

⁹The difference between the treatment effects for the bottom and top quartiles is not statistically significant for the scenario of the stay at home mother (p -value = 0.18), but it is at least marginally significant for all relative earnings situations in the second scenario.

¹⁰For example, the control group’s average first-order beliefs for the scenario in which the mother makes 15% less than her husband is 36% for those in the bottom quartile of the perception gap distribution and 82% for those in the top quartile.

positive) for both genders. Nevertheless, the overall pattern of how the size (and direction) of the treatment effects vary over the perception gap distribution suggests that while information-based updating is likely to be main channel for women, for men, it is possible that in addition to the information channel, salience may play some role, especially for those with negative perception gaps. For the second set of scenarios, as shown in Panel B of Figure A.3, the direction of the treatment effects across the perception gap distribution is consistent with both genders updating their beliefs in response to the informational content of the treatment. In general, the results by gender are also less precise.

3.3 Treatment Effect on (Intended and Actual) Behavior

To move beyond the effect of information provision on self-reported beliefs, in the July 2020 and October 2021 surveys, we added additional questions eliciting respondents' willingness to donate to a non-profit organization that advocates for women in the workplace. In particular, we told respondents to imagine that they were given \$100 and asked what proportion of this \$100 they would want to donate, clarifying that any amount that is not donated would be forfeited. In the July 2020 survey, the question was purely hypothetical, but in the October 2021 survey, this was incentivized. Specifically, we informed the respondents that we would randomly pick five survey participants and implement their choices.¹¹ Similar to the previous sections of the survey, we also asked about the respondents' second-order beliefs about average donations by gender (that is, their beliefs about the average donations of people of the same gender, living in the same state). This question comes at the end of the survey (after the treatment group has received information), and therefore it is possible that our treatment might have also changed individuals' second-order beliefs about donation levels.

Descriptive statistics about first- and second-order responses to our donation question are presented in Appendix Table A.6. The average donation of the control group is \$79 and does not depend on whether or not the donation question was incentivized.¹² This amount does vary significantly by gender: women are willing to donate \$10 more than men, on average. As with our

¹¹More specifically, in July 2020 we ask “*Consider the hypothetical situation where you are given \$100 and have to decide how much to allocate to a non-profit organization. The organization advocates for female empowerment in the workforce and for policies that help balance family-work life, including subsidized childcare and paid family sick leave. What proportion of the \$100 would you donate to the organization? Any amount that is not donated will be forfeited.*” The question for October 2021 is: “*We will be giving some respondents \$100, and they have to decide how much to allocate to Catalyst, a non-profit organization that advocates for female empowerment in the workforce and for policies that help balance family-work life, including subsidized childcare and paid family sick leave. You will be asked how much (out of \$100) you would like to donate to Catalyst. Any amount that is not donated will be forfeited. We will pick 5 survey participants at random and implement their choice. If you are picked, we will actually donate that amount that you say you want to give to Catalyst.*”

¹²Average donation was \$79.18 in July 2020 (not incentivized) and \$79.43 in October 2021 (incentivized). In the analysis, we pool the data from the hypothetical and actual donation scenarios since results are qualitatively similar for each, and doing so helps with precision.

other measures of gender attitudes, very few people think that their peers are less conservative than themselves: just 13% of respondents report a donation amount that is lower than what they believe their peers would donate. Respondents estimate that their peers will donate on average around \$71.

Figure 4 presents the treatment effect of providing information about gender attitudes among peers on the willingness to donate to the non-profit organization. The first three bars focus on own donation. We find that the intervention leads treated men, but not women, to donate significantly more than the control group. Men who were exposed to information about the true gender beliefs of their peers donated about \$5.7 dollars more than the control group, an increase of 7.6% of the average control male donation. Additionally, there is evidence that the information treatment also shifted men’s beliefs about how much would other men in their state donate ($p=0.053$).¹³

Overall, these results suggest our treatment leads to a change in (intended and actual) behavior in favor of supporting mothers in the workforce among men. The weaker results for women could be due to their overall higher willingness to donate than men (\$85 vs. \$74), making it harder to detect possible treatment effects.

4 Conclusion

We find that individuals’ own beliefs regarding maternal labor supply are affected by their perceptions of the social norm – or what they believe others think is the appropriate work choices that a mother should make. Using a set of realistic hypothetical scenarios embedded within the Survey of Consumer Expectations (SCE), we document that the large majority of respondents tend to think that they hold more progressive views than those around them, and that in most scenarios, both men and women systematically overestimate how gender conservative their peers are. We show that randomly providing respondents with information on the social norm (i.e. peer beliefs) shifts individual attitudes largely through an information channel. Moreover, the information treatment also increases respondents’ (hypothetical as well as incentivized) donations to a non-profit organization that promotes women’s participation in the labor market.

The presence of information gaps provides a possible rationalization for the apparent stickiness of gender norms even as women have made considerable progress in the economic sphere. As long as misperceptions persist, individual attitudes remain slow to adjust, and this observation appears to hold true even in a developed country like the U.S. Our findings suggest that the simple act of providing information can shift individual attitudes and behavior in an important way, although whether our light-touch intervention results in a sustained change in individual attitudes in the longer-run remains to be seen. Nevertheless, our results highlight the promising role that policy

¹³Appendix Table A.7 presents the regression equivalent of Figure 4 and shows specifications adding demographic controls.

interventions targeted at information provision can play in helping to speed up the evolution of norms.

Another important question that we leave for future work is whether information provision changes respondents' recommendations because it directly changes a person's own opinion about whether a woman should work, or because by changing their beliefs about what others think, the information lowers respondents' beliefs about the potential costs of being a working mother. Understanding the relevance of these channels could help with more effective information targeting in seeking to shift persistent gender norms.

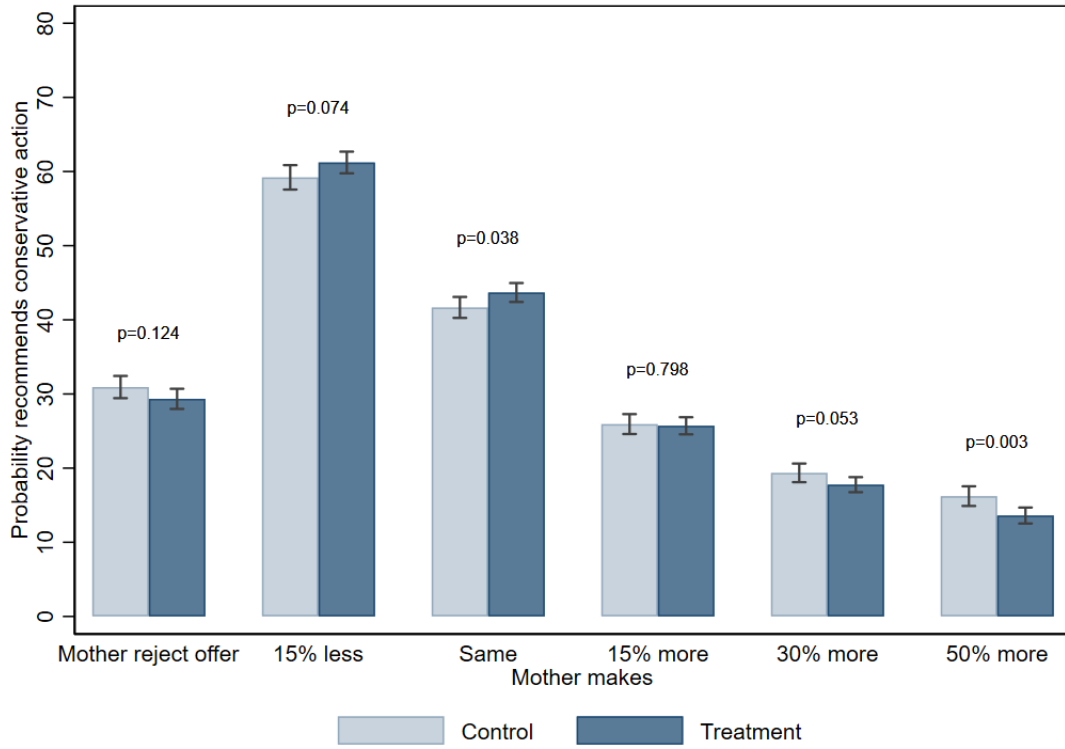
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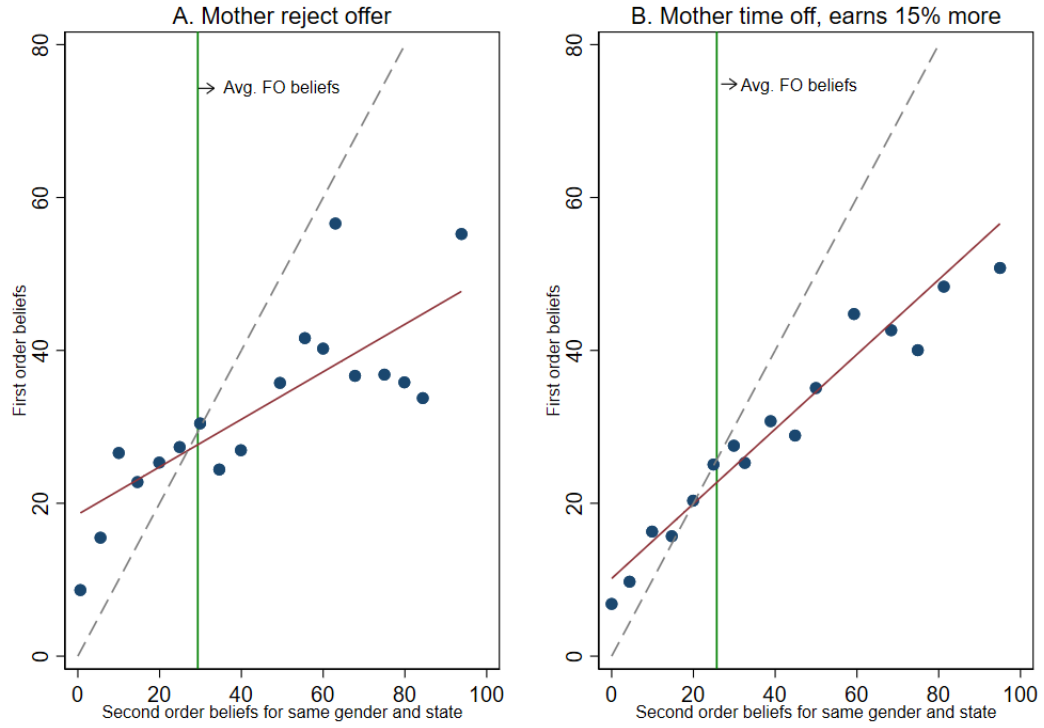
Figures and Tables

Figure 1: First-Order Beliefs: Means by Treatment Group



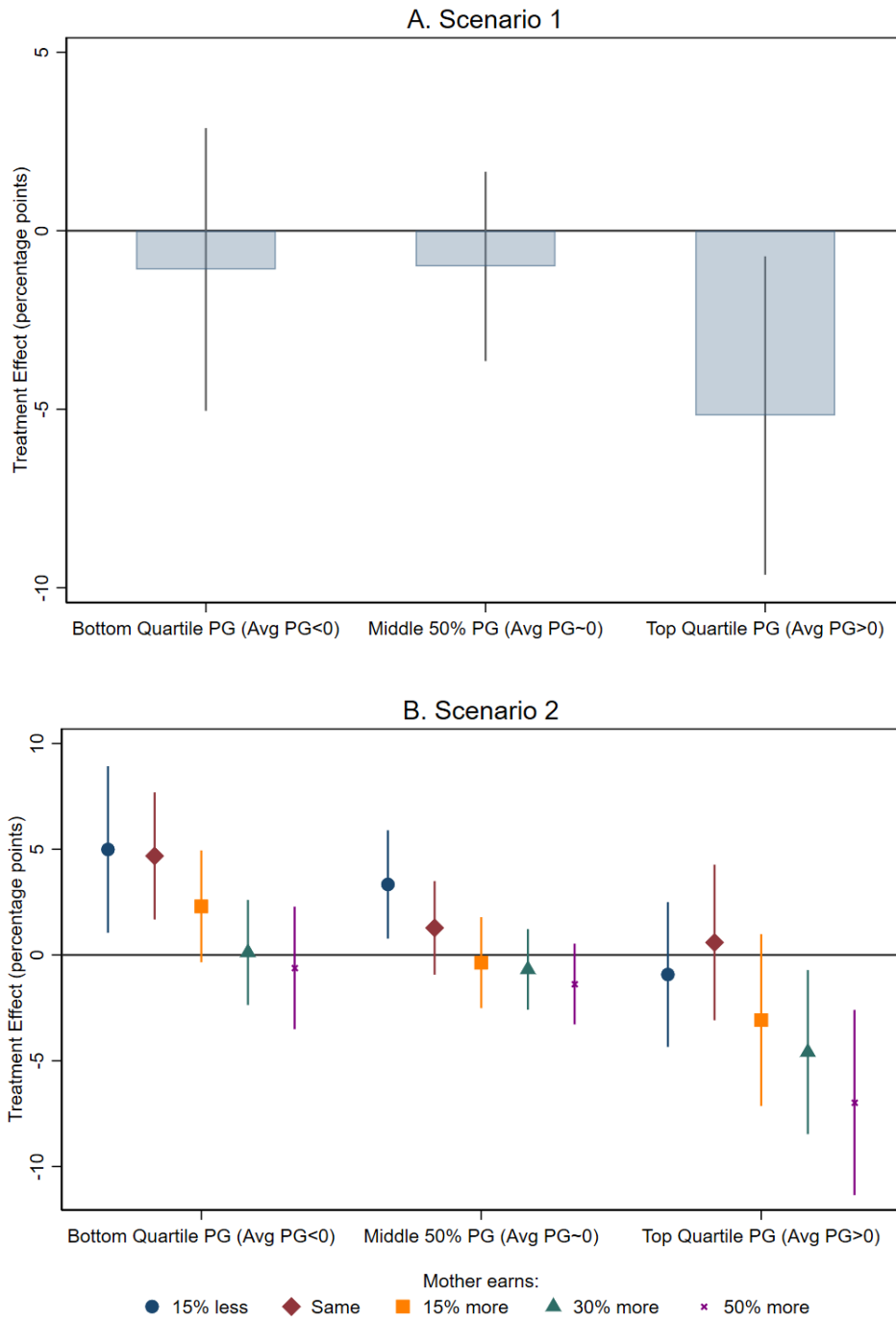
Note: Data used in this figure are from the July 2020, March 2021, September 2021, and October 2021 waves of the SCE. The p -value corresponds to the hypothesis of equality of means between control and treatment groups.

Figure 2: Binscatter of First-Order Beliefs vs Second-Order Beliefs - Control Group



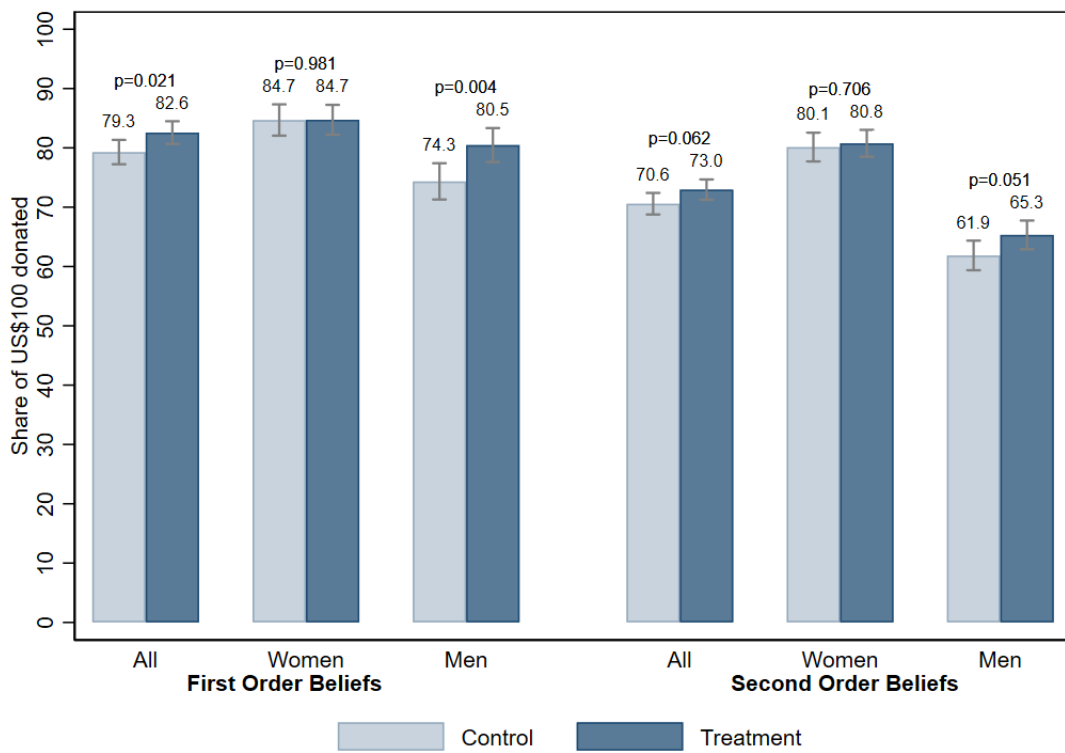
Note: The red solid line is the linear fit for the relationship between first-order and second-order beliefs. The green vertical line is the average first-order beliefs and the dashed line is the 45 degree line. Data used in this figure are from the July 2020, March 2021, September 2021, and October 2021 waves of the SCE.

Figure 3: Treatment effects by Perception Gap (PG)



Notes: Data used in this figure are from the July 2020, March 2021, September 2021, and October 2021 waves of the SCE. Perception gap (PG) is defined as the difference between an individual's second-order belief and the truth. AVG PG refers to the average perception gap for the specific range of the perception gap distribution. Each coefficient comes from a regression of the outcome variable on the treatment dummy using the sample restricted to a given segment of the question-specific perception gap distribution. 95% confidence intervals are constructed using robust standard errors.

Figure 4: Treatment effects on Donation Outcomes



Notes: Data used in this figure are from the July 2020 and October 2021 waves of the SCE. The *p*-value corresponds to the hypothesis of equality of means between control and treatment groups.

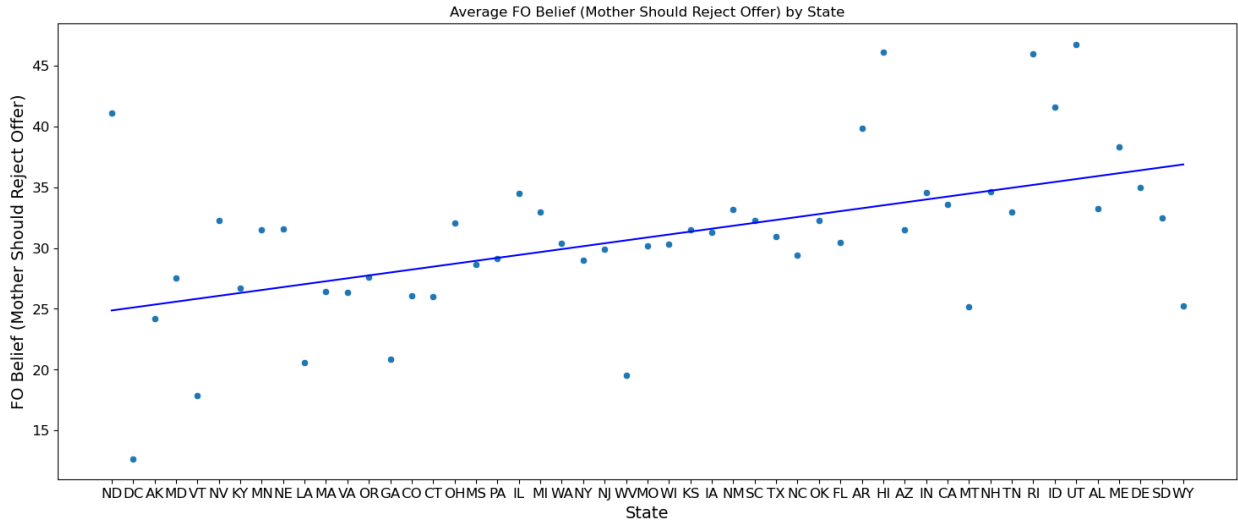
Table 1: Descriptive Statistics of First- and Second-Order Beliefs (Among the Control Group)

	Mother Rejects	Mother takes time off if she earns [...] than spouse				
	Offer	15% Less	Same	15% More	30% More	50% More
First-Order Beliefs (FO)	30.93 (31.06)	59.21 (32.65)	41.67 (27.99)	25.94 (26.60)	19.36 (24.86)	16.22 (26.32)
Second-Order Beliefs (SO)	39.85 (23.65)	63.15 (30.68)	47.01 (28.80)	32.29 (25.39)	24.55 (23.40)	19.84 (24.88)
Share SO < FO	0.27	0.30	0.27	0.25	0.22	0.21
Share SO > truth	0.62	0.60	0.58	0.53	0.50	0.40
<i>P</i> -value: Share SO > truth = 0.5	0.00	0.00	0.00	0.01	0.76	0.00
Observations	1647	1512	1512	1512	1512	1512

Note: Data used in this table come from the July 2020, March 2021, September 2021, and October 2021 waves of the SCE. Standard deviations are in parentheses. The truth is the average of the FO beliefs across people of the same gender and state as the respondent across the four surveys.

A Appendix: Figures and Tables

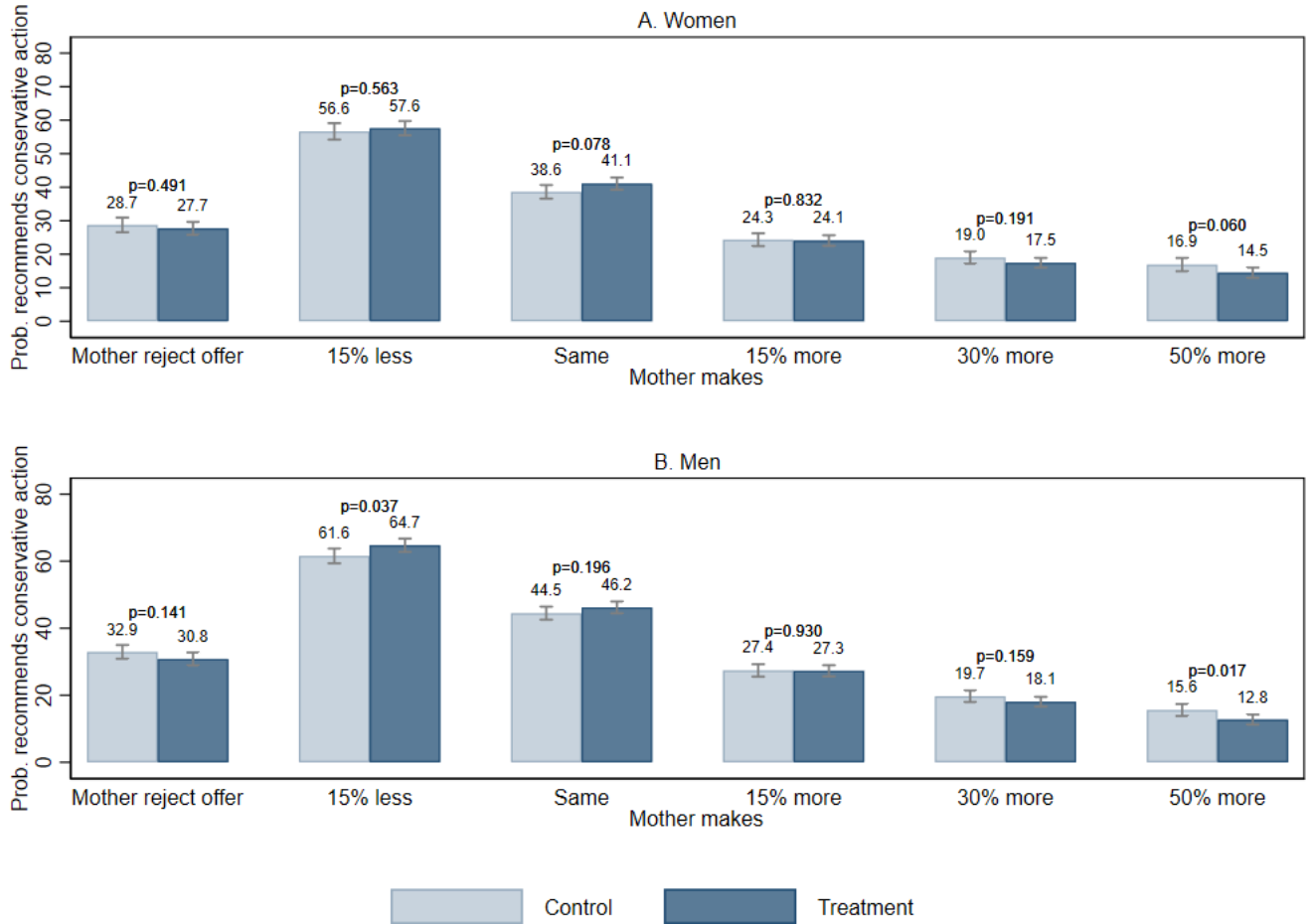
Figure A.1: Gender Attitudes by State



Equation estimate: $FO_Belief = 24.87^{***} + 0.24^{***} * state_rank$

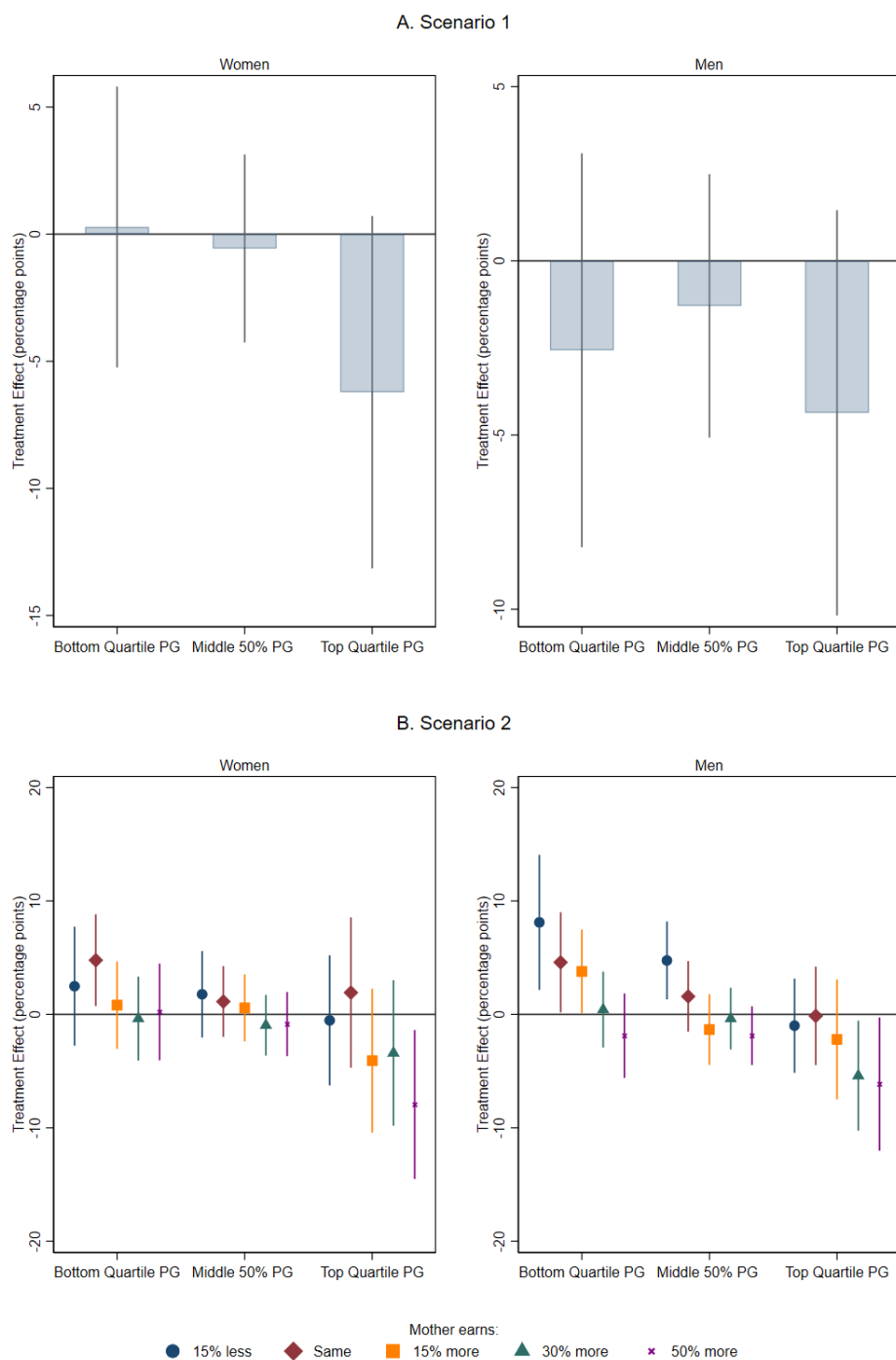
Note: States are ordered from left (most liberal) to right (most conservative) based on a conservatism index. The conservatism index is constructed based on 5 questions adapted from the GSS. We first reorder question responses so that a higher response indicates a more liberal view. Then we standardize each question for a respondent by subtracting the mean response of the sample and dividing the resulting value by the standard deviation over the full sample. Next, we take the average of the standardized value of these 5 questions for each individual. The state-level gender conservatism index is the average of this value over each individual in a given state.

Figure A.2: First-Order Beliefs: Means by Treatment Group and by Gender



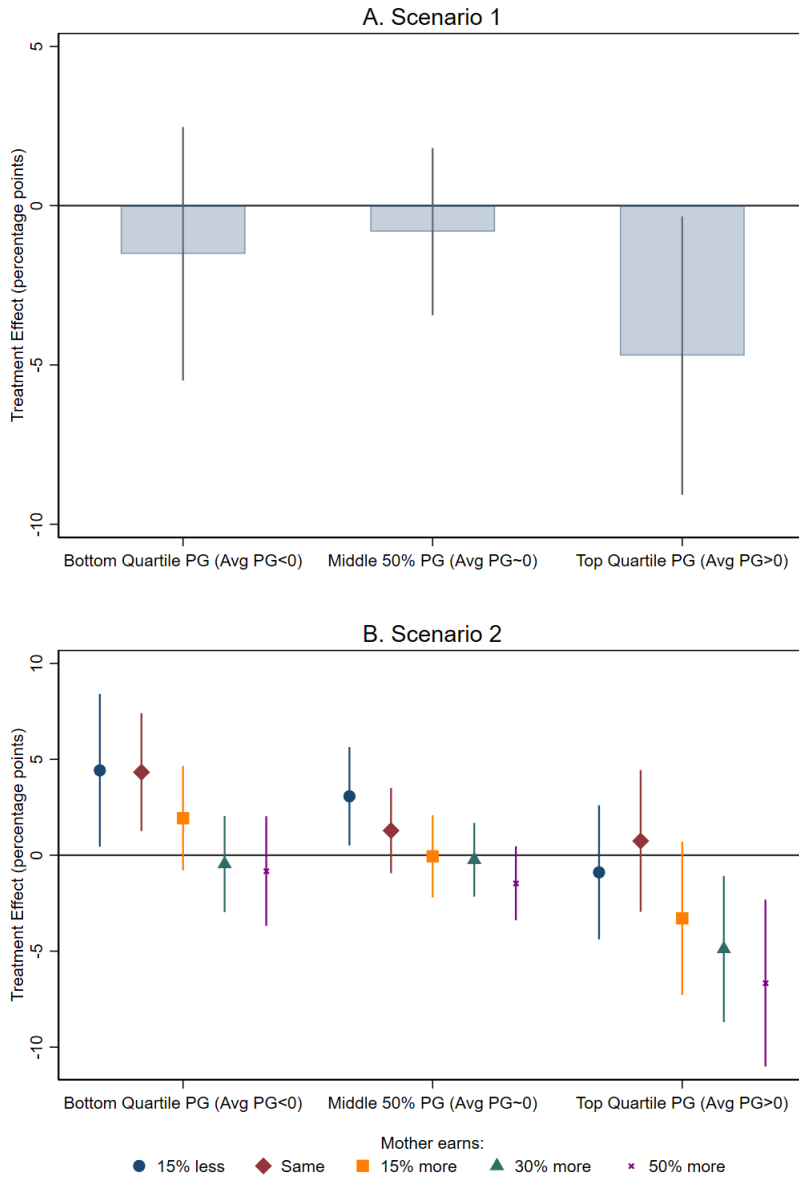
Note: Data used in this figure are from the July 2020, March 2021, September 2021, and October 2021 waves of the SCE. The *p*-values correspond to the hypothesis of equality of means between control and treatment groups.

Figure A.3: Treatment Effects by Perception Gap and Gender



Note: Data used in this figure are from the July 2020, March 2021, September 2021, and October 2021 waves of the SCE. Perception gap (PG) is defined as the difference between an individual's second-order belief and the truth. For every question, the average PG for the bottom quartile of the PG distribution is negative, for the middle 50% close to zero, and for the top quartile, positive. Each coefficient comes from a regression of the outcome variable on a treatment dummy using the sample restricted to a segment of the question-specific perception gap distribution. 95% confidence intervals are constructed using robust standard errors.

Figure A.4: Treatment Effects by Perception Gap with Demographic Controls



Note: Data used in this figure come from the July 2020 and October 2021 waves of the SCE. Perception gap (PG) is defined as the difference between an individual's second-order belief and the truth. Avg PG refers to the average perception gap for the specific range of the perception gap distribution. The demographic controls include the age and household income of the respondent as well as dummies for gender, race, having a college degree, presence of children younger than 6 and younger than 18 in the household, and working full-time. 95% confidence intervals are constructed using robust standard errors.

Table A.1: Summary Statistics

	All	Female	Male	CPS
White	0.84***	0.82	0.86	0.81
Median Age	47.00***	46.00	48.00	54.00
Average Age	48.14***	47.40	48.82	53.22
Age SD	13.76	13.71	13.77	17.35
Median HH Income (Thousands)	87.50***	67.50	87.50	55.00
Average HH Income (Thousands)	96.98***	84.21	108.62	73.24
HH Income SD	62.41	58.04	63.98	52.27
College	0.63***	0.60	0.67	0.38
Midwest	0.25***	0.25	0.24	0.20
Northeast	0.20***	0.19	0.20	0.16
South	0.35***	0.36	0.34	0.38
West	0.21***	0.20	0.22	0.26
Married	0.65***	0.57	0.73	0.56
Has Child(ren) Under 5 or 6*	0.15***	0.13	0.17	0.09
Has Child(ren) Under 18	0.37**	0.35	0.39	0.35
Working FT	0.62***	0.57	0.66	0.45
Employed	0.70***	0.68	0.72	0.58
Unemployed	0.07***	0.07	0.07	0.03
Out of Labor Force	0.22***	0.24	0.21	0.39
Obs	3758	1807	1951	824,789

Note: Obs corresponds to the number of distinct respondents in our sample. For household income, each respondent in the SCE is assigned the median value of the range corresponding to their integer response, or \$225,000 for '\$200k+' and each respondent in the CPS is assigned the median value of the range corresponding to their integer response, or \$175,000 for '\$150k+.' We define being employed as working FT or PT. An unemployed respondent is not working, but would like to work or is temporarily laid off and not employed. Respondents who are disabled or retired, along with students, homemakers are classified as out of the labor force if they are not employed or unemployed. Stars in the 'All' column denote the significance level of a two-sided t-test (for averages) or Mood's test (for medians) between the 'All' statistic and the 'CPS' statistic. Household income variable is missing for an additional 102 observations.

*In the SCE, respondents are asked if they have children under age 6 while in the CPS they are asked if they have children under age 5.

Table A.2: Correlations between Recommendation that Mother Reject Job Offer and GSS Gender Questions

	Mother should reject offer
Working mom can have warm relationship with child	-0.27***
Pre-schooler likely to suffer if mother works	0.38***
Better if man is achiever	0.37***
Wife should help husband's career	0.32***
Women earns more will cause problems	0.12***

Note: Data used in this table are from the July 2020, March 2021, and September 2021 surveys. The GSS questions are coded as dummy variables equal to one for responses "Agree" or "Strongly Agree", and zero for "Disagree" and "Strongly Disagree". To estimate the correlations we restrict the sample to the Control group. The number of observations is 1620. ***p<0.01

Table A.3: Balance Covariates: Control vs. Treatment Groups

	Control		Treatment		p-val
	Mean	Std	Mean	Std	
Female	0.48	0.50	0.48	0.50	0.79
White	0.83	0.37	0.85	0.36	0.16
Age	48.02	13.86	48.27	13.66	0.58
College	0.63	0.48	0.64	0.48	0.73
Married	0.66	0.48	0.64	0.48	0.48
Has Child(ren) 6-	0.16	0.36	0.14	0.35	0.26
Has Child(ren) 18-	0.37	0.48	0.37	0.48	0.98
Working FT	0.62	0.48	0.61	0.49	0.33
Employed	0.70	0.46	0.70	0.46	0.84
Unemployed	0.07	0.25	0.08	0.27	0.25
Out of Workforce	0.23	0.42	0.22	0.42	0.65
HH Income	96.14	61.40	97.81	63.41	0.42
Midwest	0.24	0.43	0.25	0.43	0.56
Northeast	0.20	0.40	0.19	0.39	0.55
South	0.35	0.48	0.35	0.48	0.80
West	0.21	0.41	0.21	0.41	0.80
Working mother can establish warm relationship as non-working mother	1.93	1.12	1.92	1.05	0.68
A pre-school child is likely to suffer if mother works	3.22	1.06	3.24	1.13	0.50
It is better if man is achiever and woman takes care of home	3.32	1.15	3.30	1.12	0.68
It is more important for wife to help husband's career than her own	3.56	0.85	3.53	0.88	0.39
If a woman earns more than her husband it will cause problems	3.42	1.01	3.44	1.00	0.59
Second-Order: Females in your state rec. reject offer	38.92	23.03	39.53	23.11	0.44
Second-Order: Males in your state rec. reject offer	42.39	24.98	44.41	25.38	0.02
Second-Order: Females rec. mother take time off if earns 15 pct less	59.63	29.31	58.84	29.65	0.45
Second-Order: Females rec. mother take time off if earns same	42.78	26.18	43.00	26.43	0.81
Second-Order: Females rec. mother take time off if earns 15 pct more	27.94	22.77	28.33	23.35	0.64
Second-Order: Females rec. mother take time off if earns 30 pct more	21.03	21.66	20.99	21.93	0.96
Second-Order: Females rec. mother take time off if earns 50 pct more	16.91	23.95	16.73	23.83	0.83
Second-Order: Males rec. mother take time off if earns 15 pct less	65.05	31.82	64.51	32.34	0.64
Second-Order: Males rec. mother take time off if earns same	50.02	30.80	49.92	31.33	0.93
Second-Order: Males rec. mother take time off if earns 15 pct more	35.96	27.41	35.97	27.63	0.99
Second-Order: Males rec. mother take time off if earns 30 pct more	28.15	25.15	27.90	24.55	0.78
Second-Order: Males rec. mother take time off if earns 50 pct more	23.31	26.12	23.22	25.76	0.93
Perception Gap Rec. reject offer	7.13	24.09	8.94	24.07	0.03
Perception Gap Rec. mother takes time off if earns 15 pct less	-7.77	30.62	-8.57	31.10	0.47
Perception Gap Rec. mother takes time off if earns same	-7.70	28.78	-7.88	28.42	0.86
Perception Gap Rec. mother takes time off if earns 15 pct more	-0.32	25.36	-0.39	25.30	0.94
Perception Gap Rec. mother takes time off if earns 30 pct more	0.78	23.76	0.46	23.19	0.70
Perception Gap Rec. mother takes time off if earns 50 pct more	0.82	25.37	0.52	24.77	0.74

Note: Data used in this table are from July 2020, March 2021, September 2021, and October 2021 surveys. GSS questions have responses that range from 1(Strongly Agree) to 4 (Strongly Disagree). *P*-values in the final column test equality of means between the control and treatment groups. Perception gap is defined as respondent's SO belief of their own gender minus the provided information (based on the responses from the March 2020 survey).

Table A.4: Descriptive Statistics of First- and Second-Order Beliefs by Gender (Among Control Group)

Panel A: Women						
	Mother Reject Offer	Mother Takes Time off if she earns [...] than spouse				
		15% Less	Same	15% More	30% More	50% More
First-Order Beliefs (FO)	28.73 (31.40)	56.64 (33.63)	38.62 (27.85)	24.34 (26.41)	19.00 (24.98)	16.90 (27.14)
Second-Order Beliefs (SO)	37.87 (23.31)	59.15 (30.75)	42.00 (27.31)	27.87 (23.62)	22.01 (22.70)	18.93 (25.85)
Share SO<FO	0.24	0.34	0.30	0.28	0.25	0.23
Share SO>truth	0.63	0.58	0.54	0.49	0.46	0.36
p-value share(SO>truth)=0.5	0.00	0.00	0.02	0.63	0.02	0.00
Observations	788	725	725	725	725	725
Panel B: Men						
	Mother Reject Offer	Mother Takes Time off if she earns [...] than spouse				
		15% Less	Same	15% More	30% More	50% More
First-Order Beliefs (FO)	32.95 (30.62)	61.58 (31.56)	44.48 (27.85)	27.42 (26.71)	19.70 (24.75)	15.60 (25.54)
Second-Order Beliefs (SO)	41.66 (23.84)	66.83 (30.16)	51.63 (29.38)	36.37 (26.28)	26.88 (23.81)	20.68 (23.93)
Share SO<FO	0.30	0.27	0.24	0.22	0.18	0.19
Share SO>truth	0.62	0.62	0.62	0.57	0.53	0.44
p-value share(SO>truth)=0.5	0.00	0.00	0.00	0.00	0.07	0.00
Observations	859	787	787	787	787	787

Notes: Data used in this table are from the July 2020, March 2021, September 2021, and October 2021 waves of the SCE. Standard deviations are in parentheses. The p -value corresponds to the hypothesis of equality of means between control and treatment groups.

Table A.5: Treatment Effects on First-Order Beliefs

	Mother Rejects Offer	Mother takes time off if she earns [...] than spouse				
		Earns 15%	Same	15% More	30% More	50% More
Panel A: Without Controls						
All						
treatment	-1.59 (1.03)	2.01* (1.12)	2.01** (0.97)	-0.23 (0.90)	-1.59* (0.82)	-2.62*** (0.87)
Women						
treatment	-1.02 (1.49)	0.95 (1.65)	2.46* (1.39)	-0.27 (1.27)	-1.54 (1.18)	-2.41* (1.28)
Men						
treatment	-2.11 (1.43)	3.16** (1.51)	1.74 (1.34)	-0.11 (1.28)	-1.62 (1.15)	-2.85** (1.19)
Panel B: With Controls						
All						
treatment	-1.45 (1.02)	1.76 (1.11)	1.95** (0.97)	-0.17 (0.90)	-1.56* (0.82)	-2.62*** (0.87)
Women						
treatment	-0.53 (1.47)	0.87 (1.65)	2.37* (1.40)	-0.52 (1.29)	-1.91 (1.21)	-2.78** (1.31)
Men						
treatment	-2.32 (1.42)	2.63* (1.51)	1.65 (1.34)	0.06 (1.27)	-1.44 (1.14)	-2.71** (1.19)

Note: Data used in this table are from the July 2020, March 2021, September 2021, and October 2021 waves. Each number comes from a different regression. Robust standard errors are in parentheses. Controls include survey dummies, the age and household income of the respondent, and dummies for gender, race, having a college degree, presence of children younger than 6 and younger than 18 in the household, and working full-time. ***p<0.01, **p<0.05, *p<0.1.

Table A.6: Descriptive Statistics for the Donation Question (Control Group)

Share of \$100 would donate to support working women			
	Overall	Men	Women
First-Order Beliefs (FO)	79.29 (35.93)	74.35 (38.64)	84.69 (31.88)
Second-Order Beliefs (SO)	70.58 (31.79)	61.86 (31.50)	80.13 (29.29)
Share FO < SO	0.13	0.15	0.10

Note: Data used in this table were collected in July 2020 and October 2021. Reported numbers are averages and standard deviations are in parentheses. The sample size for women is 612 and 561 for men.

Table A.7: Donation Regressions

	Dep. Var: Share Donated				Observations
	First-Order Beliefs		Second-Order Beliefs		
	(1)	(2)	(3)	(4)	
All					
Treatment	3.29** (1.43)	2.87** (1.44)	2.37* (1.27)	1.35 (1.23)	2359
Women					
Treatment	0.04 (1.86)	-0.28 (1.85)	0.64 (1.69)	0.02 (1.69)	1146
Men					
Treatment	6.12*** (2.13)	5.69*** (2.18)	3.46* (1.77)	2.39 (1.79)	1213
Controls		Yes		Yes	

Note: Data used in these regressions come from the July 2020 and October 2021 waves of the SCE. Each cell in the table reports the treatment effect from a different regression. Robust standard errors are in parentheses. Controls include survey dummies, the age and household income of the respondent, and dummies for gender, race, having a college degree, presence of children younger than 6 and younger than 18 in the household, and working full-time. ***p<0.01, **p<0.05, *p<0.1.