

Misperceptions Regarding Women's Employment Outside the Home and Their Impact on Women in Saudi Arabia*

Boxuan Yi Ruoxian Wu

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Husbands who hold guardianship and discourage their wives from working outside the home are often perceived as the main reason for the low female workforce participation in Saudi Arabia. This paper analyzes this common perception, revealing that a majority of young husbands in Saudi Arabia privately support women working outside the home but underestimate the support of other men. This paper also discusses the positive effects brought about by correcting this misperception, strategies for reducing information intervention, and the unusual Saudi female employment rate during the pandemic.

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*Code and data are available at: <https://github.com/ScarletWu/Misperceived-Social-Norms-Women-Working-Outside-the-Home-in-Saudi-Arabia>. Replication on Social Science Reproduction platform is available at: <https://www.socialsciencereproduction.org/reproductions/1557/index?step=0>. The original paper and its replicated package can be found here: <https://www.aeaweb.org/articles?id=10.1257/aer.20180975>.

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1 Introduction

Barriers to the employment of women exert a significant influence on female labor, presenting a constraint to increasing economic opportunities for women (Eger et al. 2022). Saudi Arabia is an example of a country with a low rate of female labor force participation. In 2022, the female labor force participation rate, defined as the percentage of the female population aged 15 and above that is employed, is only 27.8% in Saudi Arabia. This is notably lower than the global average of 47.3%, while the male labor force participation rate in Saudi Arabia remains high at 80% (“Labor Force Participation Rate”).

The prevailing societal norms in Saudi Arabia, characterized by a low rate of women working outside the home and the customary practice of husbands’ guardianship with decision-making authority, contribute to the perception that Saudi men are unwilling to permit their wives to work (Bursztyn, González, and Yanagizawa-Drott 2020). The paper ‘Misperceived Social Norms: Women Working Outside the Home in Saudi Arabia’ by Bursztyn, González, and Yanagizawa-Drott delves into this social norm, exploring Saudi men’s perceptions of opinions regarding WWOH.

Based on survey responses and experiments results, they find that a large portion of young married men in Saudi Arabia privately support women working outside the home. Importantly, these men greatly underestimate the proportion of support among other similar men (Bursztyn, González, and Yanagizawa-Drott 2020). The study population is young married husbands aged 18 to 35 in Saudi Arabia. We aim to replicate the estimand that focuses on the effects of providing husbands with the true proportion of support. Their findings suggest that men who are given the actual proportion of their peers supporting WWOH are more likely to support their wives’ labor supply, and their wives are more likely to apply for job, attend interviews, be employed and enrol in driving lessons. Correcting misperceived beliefs yields positive impacts on females employment, and insufficient communication is associated with an increased likelihood of misperceptions (Bursztyn, González, and Yanagizawa-Drott 2020).

Our paper will follow a reproduction of Leonardo Bursztyn, Alessandra L. González, and David Yanagizawa-Drott’s findings. We seek to replicate two claims, (1) There is a wedge between the actual and perceived proportion of men supporting women working outside the home, and (2) Most Saudi men who privately support WWOH fail to understand that others do as well,

and they are more likely to help their wives find jobs when they know the actual portion of men supporting WWOH. The experiments and surveys results we will try to replicate are (1) the actual portion of support of WWOH from young husbands, (2) the existence of misperception, and (3) the effects of correcting beliefs on female employment in Saudi Arabia. Our reproduction used the programming language R (R Core Team 2022), the analysis used the following packages: Haven(Wickham, Miller, and Smith 2023), Dplyr (Wickham et al. 2023), Ggplot2 (Wickham 2016), Readr (Wickham, Hester, and Bryan 2024), Here (Müller 2020), Janitor (Firke 2023), KableExtra (Zhu 2024), Knitr (Xie 2014), Tidyverse (Wickham et al. 2019).

In the next section, we will discuss data including data source, methodology and features. After that, we will create a reproduction of the selected results to verify their data and their findings based on the data. In the last section, we will discuss the impact of informational intervention, the use of social proof to overcome harmful norms, and the inverse pattern of female labor force participation rate in Saudi Arabia during the pandemic. We will also conclude ethics, potential bias, and weaknesses topics, as well as a push for future research.

2 Data

2.1 Source

The replication package is obtained from ‘Misperceived Social Norms: Women Working Outside the Home in Saudi Arabia’, a paper from the American Economic Association (Bursztyn, González, and Yanagizawa-Drott 2020). Our reproduction seeks to address two findings written in the original paper, using results authors collected through the main experiment, follow-up, an online survey, and the programming language R (R Core Team 2022).

2.2 Data cleaning

The raw dataset underwent a cleaning process to address missing values and recalibrate variables. This included updating the `labor_demand_guess` from multiple sources if it was missing, recalculating `signed_up_number` based on specific conditions, and removing out-of-range values from the age. New variables like `college_deg` and `married` were generated based on education and marital status, respectively. The dataset also saw the introduction of proportionate variables such as `num_know_per` and `num_mfs_per`. After refining variables for analysis, such as `outside_guess`, `semiseg_guess`, and `mwage_guess`, and their associated calculations, irrelevant variables were dropped. The cleaned data was then saved and is now ready for further analysis.

2.3 Methodology and Features

2.3.1 Main experiment and Follow-up

The original study recruited 500 married Saudi males aged 18 to 35 from Riyadh as participants. Initial contacts were established using a recruiter database, with further recruitment using a combination of snowball sampling and random street intercept (Bursztyn, González, and Yanagizawa-Drott 2020).

Participants were organized into 17 sessions, each comprising 30 individuals. The survey, administered through Qualtrics, encompassed questions about demographic information, opinions, agreement with statements, and estimations regarding the agreement of other 29 participants with each statement. Particularly, there were two statements about female labor participation. Following this, half of the participants were assigned to a treatment group randomly. Those in the treatment group were provided with information on the proportion of respondents who agreed or disagreed with each statement, while participants in the control group received no information. Respondents were then asked to make an incentivized choice between a five-dollar Amazon gift card and the opportunity to sign up their wives for a job matching platform (Bursztyn, González, and Yanagizawa-Drott 2020). Follow-up calls were conducted 3-5 months after the main experiment. These calls collected information about whether the wife was employed during the main experiment, whether the wife was currently employed, and if she was currently employed, whether the job was outside the home (Bursztyn, González, and Yanagizawa-Drott 2020).

The main experiment dataset contains 500 observations and 36 variables. Variables include age, level of education, number of children, whether this man and his wife are employed now, number of people known in the group and other variables related to WWOH statements. The follow-up dataset contains similar demographic data and information about wives' employment, interviews and driving lessons. There are 33 variables in the follow-up dataset. Details and explanations using visualization will be further discusses in the next section.

The variables from the main experiment dataset that we will use are `condition2` (control or treatment group), `age`, `children` (number of children), `college_deg` (whether the participant has college degree or above), `employed_now` (if the participant is employed when conducting the experiment), `employed_wife` (if the participant's wife is employed when conducting the experiment), `num_know_per` (percentage of people known in the session), `num_mfs_per` (percentage of people in the session with mutual friends), `signed_up_number` (whether the husband sign wife up for job matching), `outside_wedge` (guessing number of people in the session supporting WWOH minus the actual number of people in the session supporting WWOH). Variables will be used in the follow-up dataset are `condition2` (control or treatment group), `employed_3mos_out_fl` (if the participant's wife was employed three months ago when conducting the experiment), `applied_out_fl` (if the wife apply for job working outside), `interviewed_out_fl` (if the wife interview for job working outside), `employed_now_out_fl` (if the

wife be employed for job outside), and driving_fl (if the husband is willing to sign his wife up for driving lessons).

2.3.2 Online survey

The online survey included approximately 1500 married Saudi men aged 18 to 35, randomly assigned to either a treatment or control group. In the control group, participants were presented with statements that were contentious but not stigmatized. In the treatment group, participants received an identical list of items with an additional, potentially stigmatized item for which the experimenters would like to elicit beliefs. All participants were then asked to indicate the number of statements they agree with, and the respondents from the control group were asked if they agreed with a WWOH statement individually (Bursztyn, González, and Yanagizawa-Drott 2020). Finally, the experimenters asked participants in the control condition to estimate the percentage of other participants who reported agreeing with the same statement, and asked participants from the treatment group to estimate the percentage of other participants who would privately agree with the WWOH statement (Bursztyn, González, and Yanagizawa-Drott 2020).

The dataset resulting from online survey comprises 1460 observations and 21 variables. These variables include condition, age, employed_now, employed_wife, employed_out_wife, children, and the responses to the survey questions for both groups as indicated above, along with participants' confidence levels in some of the answers. Details and explanations using visualization will be further discusses in the next section. The variables will be used are c_outside_guess_frac (guessing the fraction that support WWOH in the control group), t_outside_guess_frac (guessing the fraction that support WWOH in the treatment group), c_outside_mean (the mean of actual proportion of support in the control group), t_outside_mean (the mean of actual proportion of support in the treatment group).

3 Results

In the main experiment, the “wedge” in Figure 1 is calculated as ‘participant’s guess about the percent of session participants agreeing with the pro-WWOH statement’ minus ‘actual percent of session participants agreeing with the pro-WWOH statement’. A negative wedge indicates that the participant underestimate the support for WWOH, while a positive wedge suggests that the participant overestimate the support. The red dashed vertical line represents a wedge of 0, showing a correct guess of the proportion. From the distribution of Figure 1, 71.8% of participants underestimate the support for WWOH among session participants, with an average wedge of -24.1%, even though these individuals were recruited from the same neighbourhoods and knew an average of 15 out of 29 people in the session. There is a clear gap between perceived and actual social norms regarding women’s work outside the home.

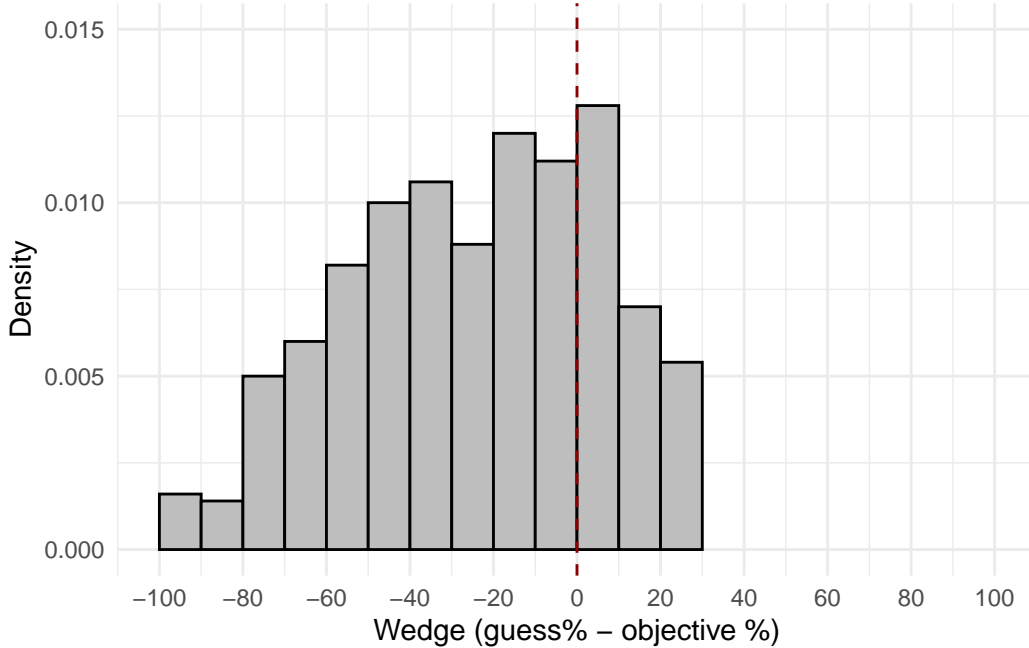


Figure 1: Wedges in Perceptions of Others' Beliefs (Main Experiment)

Before discussing the results concluded from experimental intervention, Table 1 presents a summary of features of the groups - control group and treatment group, as well as all participant as a group. As mentioned in Section 2, 500 participants are randomly assigned to either the control group or treatment group. According to Table 1, we can infer from the comparable statistics that the randomization in the experiment is successful, with individual characteristics balanced in all three groups. For instance, all groups have a similar average age, with the control group at 24.64 years and the treatment group at 24.91 years. Employment rates are also on the same level, with 87.45% in the control group compared to 85.77% in the treatment group. Each number in parentheses is the p-value of the row above.

Figure 2 displays the main result from the experimental intervention, illustrating the difference in job matching service sign-up rates between the control and treatment groups. In the control group, 23.48% of participants are willing to sign up their wives for the job service when provided with another gift card option. In the treatment group, where participants are given the actual proportion of support for WWOH, 32.02% of the respondents prefer to sign up their wives for the job service, which is a 32% increase (with a p-value of 0.0424). The combination of Table 1 and Figure 2 demonstrates the effects of the information intervention on participants' behavior and opinions towards women's labor market participation, revealing not only a statistical significance but also practical importance in the context of social norms and labor supply outcomes in Saudi Arabia.

Table 1: Summary Statistics (Main Experiment)

	All	Control	Treatment
Observations	500	247	253
Age	24.78 (4.21)	24.64 (3.99)	24.91 (4.41)
Number of Children	1.71 (1.72)	1.64 (1.7)	1.77 (1.74)
College Degree (%)	56.2	55.06	57.31
Employed (%)	86.6	87.45	85.77
Wife Employed (%)	65.2	65.59	64.82
Wife Working Outside the Home (% retrospective follow-up)	8.4	7.89	8.9
Other Participants Known (%)	51.19 (38.24)	49.68 (38.6)	52.66 (37.92)
Other Participants with Mutual Friends (%)	38.64 (34.94)	37.62 (34.62)	39.63 (35.29)

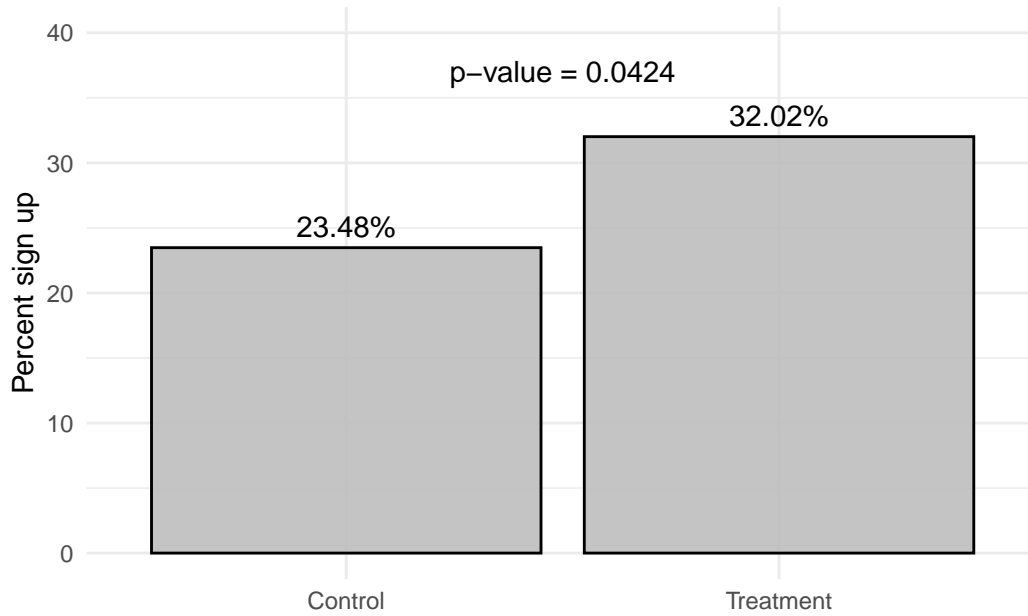


Figure 2: Job Matching Service Sign Up (Main Experiment)

The longer-term outcomes of the experiment on information intervention are shown in Figure 3 with error bars indicating the 95% confidence intervals for these proportions. The percentage of wives applying for a job outside the home is presented in Figure 3 a. In the control group, 6.04% of wives apply for jobs outside, while 16.74% wives in the treatment group choose to do so. The increase in application rate is quite obvious, nearly a 180% increase with a p-value of 0.001. Figure 3 b shows the impact of the informational intervention on outside-home job interviews. The interview rate in the control group is 1.1% while the treatment group has 5.95%, with p-value of 0.013. Both Figure 3 a and Figure 3 b display significant increases. Regarding the employment rates for this kind of job, Figure 3 c shows that the employment rate increases from 7.69% to 9.73%. Although this indicates an increase, it is not statistically significant (p-value = 0.456), implying that though the intervention might have had an encouraging effect on job-seeking behavior, it does not translate into a significant difference in actual employment within the study period.

To further explore the long-term influence, Figure 3 d shows the share of husbands who report in a hypothetical question whether they would sign their wives up for driving lessons. The control group has a rate of 68.13%, and the treatment group has a rate of 78.38%, with p-value as 0.03. The increase in husbands' willingness to sign their wives up for driving lessons implies that correcting misperception influences beyond behaviours associated with female employment, creating potential impacts on broader social norms and attitudes toward women's conditions in Saudi Arabia. Overall, the treatment has a significant effects on both immediate and longer-term outcomes related to women labor market participation based on Figure 3.

Figure 4 is created to illustrate the results of the national survey conducted with 1460 Saudi men aged from 18 to 35. The x-axis represents the share of others agreeing, and the y-axis denotes the cumulative probability that participants agree with the pro-WWOH statement. Two vertical lines in Figure 4 represent the actual proportion of respondents who agree with the statement. There is no significant difference between the data concerning the control group and the treatment group. Figure 4 reveals that the average proportion of support for both groups is slightly above 80%, while more than 90% of men underestimate this proportion. The number of underestimations is larger than the number observed in the main experiment, and one explanation is that participants are no longer being asked about opinions from people that they are familiar.

This figure, once again, underscores the discrepancy between personal beliefs and perceived societal norms. The larger sample size of this national survey also bolsters the evidence that men privately support women's employment outside the home more than they assume others do, suggesting widespread misperceptions in current Saudi society.

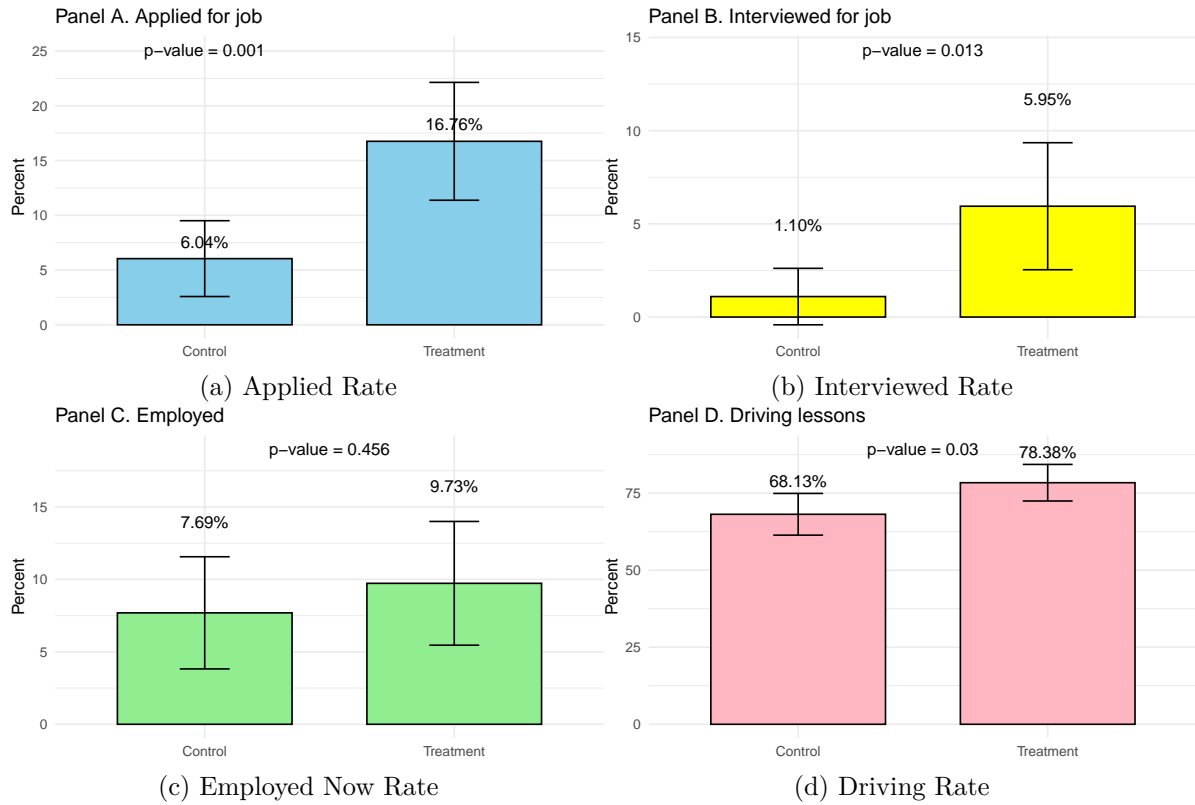


Figure 3: Long-Term Labor Supply Outcomes (Follow-Up)

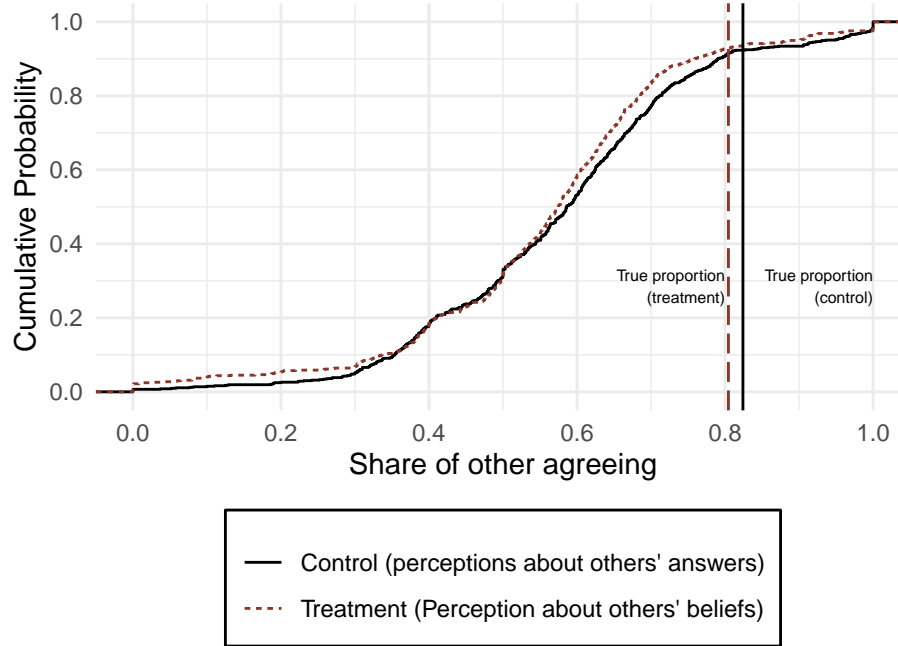


Figure 4: Misperceptions about Others' Beliefs (National Survey)

4 Discussion

4.1 Impact of Informational Intervention:

The research findings have highlighted the importance of correcting misperceived social norms, not only to increase women's participation in the labor market but also to make progress in broader social norms and attitudes towards women's rights and autonomy. The study shows that interventions aimed at challenging and changing societal norms can have a significant impact on women's economic participation and social development. For instance, the study found that after an information intervention, more husbands were willing to sign up their wives for driving lessons, indicating a shift towards more progressive attitudes regarding women's mobility and independence. These changes can contribute to economic development by increasing the labor force and promoting gender equality. The researchers suggest that similar interventions could be effective in other contexts where misperceptions about social norms limit women's economic participation. This approach can offer valuable insights for policymakers and organizations aiming to promote gender equality and economic development, emphasizing the role of accurate information in challenging and changing societal norms. In today's world, digital platforms and social media hold a significant impact on the formation of public opinion and social norms. By making strategic use of these technologies, we can effectively disseminate accurate information and correct any misconceptions. We can leverage online platforms to share data on societal attitudes towards WWOH. This will enable interventions to reach a

much wider audience, facilitating a more rapid and widespread change in perceptions.

4.2 Broader Social Proof Implications

It is possible to overcome harmful norms in cultural and societal settings by using social proof.

One study Gregg and Walton (2017) found that communicating the increasing popularity of environmentally friendly behaviors encouraged individuals to adopt these behaviors themselves, demonstrating the power of social proof in effecting change in environmental contexts. This suggests that highlighting positive changes in societal behaviors can be effective in encouraging the adoption of new, more beneficial norms and practices, rather than focusing on static norms.

Another study Cislighi and Clark (2019) has evaluated the impact of “organized diffusion” on community-based health and women’s empowerment programs. This approach involves encouraging individuals who have received training or information to share it with others, thus spreading the benefits more widely. The study, which looked at programs in Mali, Nepal, and Nigeria, found that implementing this method can lead to significant changes in social norms without incurring additional costs.

These studies show that by understanding and addressing specific normative beliefs underlying societal issues, policymakers and practitioners can design targeted interventions that utilize social proof effectively. By presenting evidence of changing norms and behaviors within a community, we can foster a more inclusive, equitable, and sustainable society.

Integrating these studies enhances our understanding of how social proof can be applied across different issues and cultural contexts to promote positive social change.

4.3 Inverse Pattern of Saudi female labor force participation rate during pandemic

According to the Gender Data Portal from The World Bank, the global average labor force participation had a decrease of 1.6%, reaching 58.6% in 2020, followed by a rebound to 59.5% in 2021 (“Labor Force Participation Rate”). In fact, this trend was observed across various countries, irrespective of gender. For example, the Canadian female labor force participation rates in 2019, 2020 and 2021 were 61.4%, 59.5%, 60.6%, respectively, and the Canadian male labor force participation rates for the same years were 70.1%, 68.6%, 69.6%. Similarly, the female labor force participation rates in 2019, 2020 and 2021 were 23.7%, 22.7%, 23%, while corresponding male rates stood at 73.6%, 72.3%, 72.7% in India (“Labor Force Participation Rate”).

Interestingly, Saudi Arabia exhibited an inverse pattern. While the Saudi male labor force participation rate remained relatively stable, the female rate, along with that of the United

Arab Emirates, increased in 2020 and then decreased in 2021. To be more specific, the Saudi female labor force participation rate had a notable increase of 4.9% (nearly one-fifth of the total), reaching 29.5% in 2020, and then declining to 27.8% in 2021. Similarly, female rate in United Arab Emirates increased by 4.2% to 61% in 2020, but decreased to 52.8% in 2021 (“Labor Force Participation Rate”).

The observed fluctuation in world labor force participation rates, particularly Saudi Arabia, leads to speculation on the underlying factors driving these trends. The impact of quarantine is a significant factor, as individuals working from home remained mostly unaffected, unlike those in traditional office settings. This is likely the reason behind the abnormal employment pattern among Saudi women at the start of the pandemic. Moreover, the contrasting pattern in Saudi female labor force participation rate, compared to the world trend, highlights the phenomenon that many employed females tend to work at home, either willingly or due to traditional social norms. The surge observed in 2020 may suggest potential willingness among Saudi women to explore employment opportunities, which once again highlights the importance of correcting misperceptions.

4.4 Bias, Ethics and Weaknesses

Throughout the survey and experiment, all participants granted permissions for the collection of data. After gathering information, the experimenters ensured that all responses remain confidential and anonymous, so the data we used for replication in this paper was also anonymous, with only the last three digits of their phone numbers retained. As a result, there are no ethical concerns during the process and in the paper.

We implemented many modifications to the questions and weights in an attempt to minimize bias in the survey. However, it is acknowledged that bias is always a challenge when conducting experiments. The main experiment survey has a participant pool of 500 married men from Riyadh. Since Riyadh is the capital and the largest city in Saudi Arabia, the sample size might be relatively small and potentially biased. Considering the economy in Saudi Arabia and Riyadh, the reward offered, typically a five-dollar or twenty-dollar gift card, could be another factor contributing to the weakness in both the original paper and our paper.

The paper focuses on married men aged 18 to 35 with some level of post-secondary education. It is noted that the enrolment rate among students aged 20-24 in secondary program is relatively high in Saudi Arabia (OECD), so setting the age range from 18 to 35 might be a weakness in the experiment. There is a potential correlation between individuals who did not participate in the follow-up and those who do not support Women Working Outside the Home, also introducing the possibility of bias.

4.5 Next steps

Although there is a customary practice of husbands' guardianship with decision-making authority in Saudi Arabia, gaining insights into the opinions of Saudi women regarding employment and working outside the home is essential for future study. The original paper mentioned that 'expanding the scale and observing how information spreads in networks, and how it affects a large set of outcomes is an important topic for future work' (Bursztyn, González, and Yanagizawa-Drott 2020). Considering the potential biases and the experiment result claiming that correcting misperceived beliefs increase husbands' support in WWOH, future research could greatly benefit from the extension of scale to enhance generalizability and actual effects on female employment in Saudi society.

Figure 9 in the original paper reveals that males who often engage in discussions about the WWOH have perceived proportion of support only four percent smaller than the actual proportion (Bursztyn, González, and Yanagizawa-Drott 2020). For those who rarely or very rarely discuss about the WWOH, their perceived proportion of support for WWOH is around forty percent smaller than the actual proportion. If the lack of communication facilitates misperceptions, one would expect a correlation between the frequency of communication and perceptions (Bursztyn, González, and Yanagizawa-Drott 2020). Consequently, future studies could delve into strategies in preventing misperceived opinions from negatively influencing social norms, and explore decision-making in the presence of collective misperceptions.

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