



# Essays on Gender and Decision Making in Political Economy

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## Essays on Gender and Decision Making in Political Economy

### **Abstract**

This dissertation contains three essays that address supply side, demand side and political factors that influence the attitudes and decisions that shape women's economic and political status. It demonstrates how self-expectations and beliefs about relative ability shaped women's decisions to lean out of competitive environments when representing others; how descriptive norm nudges that favored women and focused on their gains incited male reactance in hiring; and how in the aftermath of the Egyptian Revolution, Egyptian men updated their attitudes towards women's role in society.

Essay 1 tackles the supply side by investigating possible factors shaping women's willingness to "lean in" and compete when having to represent others. For women to advance in many male dominated sectors (e.g. business and political leadership), they need to compete with, and outperform men while representing their gender as minorities, and the interests of their constituents. This study examined the role that being a 'representative' plays in competition behavior of men and women through a laboratory experiment where self-representing and other-representing individuals had to decide whether to enter into a mix-gender tournament that involved performing in a male-typed task. While self-representing men and women exhibited very similar performance and competition behaviors, women 'representatives' leaned *out*.

Controlling for differences in performance, female ‘representatives’ were less likely to enter into tournaments than male ‘representatives’ and self-representing women. In addition, female ‘representatives’ did not significantly increase their performance, while male ‘representatives’ experienced a boost in their performance levels as compared to the self-representing men. The leaning out of female ‘representatives’ from competition entry is largely attributed to women setting a higher bar for themselves when charged with representing another individual as compared to self-representing women. Furthermore, compared to male ‘representatives’, female ‘representatives’ were significantly less confident in their abilities, explaining the gender gap in competition entry amongst other-representing individuals.

Essay 2 focuses on the demand side by studying whether descriptive norm information can nudge individuals to make more gender diverse hiring decisions. My co-authors and I conducted a series of laboratory experiments where ‘employers’ decided how many male and female ‘employees’ they wanted to hire for male- and female-typed tasks and examined whether employers were more likely to hire more of one gender when informed that others have done so as well. In this set-up, descriptive norms did not have prescriptive effects. In fact, descriptive norms did not affect female employers’ hiring decisions at all and led to norm reactance and backlash from male employers when informed that others have hired more women. This male reactance was particularly pronounced when the norm’s frame emphasized women’s gains.

Finally, Essay 3 utilizes the tumultuous aftermath of the Egyptian Revolution, to empirically examine changes in gender attitudes of men—individuals who hold the majority of leadership positions in Egypt and play a significant role in determining women’s access to economic and political opportunities. The results revealed that, all else equal, the political crisis in Egypt was highly correlated with men adopting more egalitarian gender attitudes. Support for

girls' university education (i.e. a mostly gender-neutral domain in Egypt) significantly increased only amongst men from financially struggling households and was highly associated with their amplified concerns regarding the availability of suitable employment for women. In contrast, men's greater confidence in women's political leadership and support for women's workforce entry (i.e. both traditionally male domains) was not associated with their increased political or economic grievances, but with the decreased credibility of religious leaders. At the same time, men's updated gender attitudes do not appear to be part of broader changes in their worldviews towards a more "modern" and "secular" outlook as a result of the failures of the post-Revolutionary religious government. Instead, changes in men's gender attitudes, particularly with regard to women's greater involvement in traditionally male domains, seems to reflect acceptance of more favorable treatment of women *within* Islam.

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*To Namaki and Pooran  
Your journeys and strength inspire me every day...*

## **Chapter 1:**

### **Executive Summary**



## 1.1. Introduction

All societies are made up of political and economic agents who behave according to their individual-level beliefs and decision-making processes, shaping the political economy. In addition, changing political and economic conditions also influence these agents to update their perspectives and make different decisions. This dissertation examines how these dynamics influence the status of women. Women continue to be drastically underrepresented in many domains, including politics, business, and science, technology engineering and math (STEM) fields. In fact, as of January 2016, only 22 percent of all national parliamentarians were women, which reflects a slow increase from 11.3 percent twenty years ago (Inter-Parliamentary Union, 2016). Many factors could be responsible for these persistent gender gaps, a few of which are examined in this dissertation.

Essay 1 focused on supply side constraints by investigating whether and why women would shy away from competing in male-dominated arenas (e.g. politics, corporate leadership). Essay 2 studied one of many demand side factors by testing whether descriptive norms can nudge individuals to make more gender diverse hiring decisions. Finally, Essay 3 utilized the dynamic aftermath of the Egyptian Revolution, which brought about rapid political and economic changes, to examine shifts in gender attitudes of men—individuals who hold the majority of leadership positions in Egypt and play a significant role in determining women's access to economic and political opportunities.

The essays in this dissertation demonstrate how self-expectations and beliefs about relative ability influenced women's decisions to shy away from competitive environments when serving as representatives; how descriptive norm nudges that favored women incited male

backlash in hiring; and how the political crisis in Egypt was associated with men updating their attitudes towards women's role in society.

Each essay will be reviewed in turn.

## **1.2. Essay 1: Competing on Behalf of Others: Women Lean Out**

Essay 1 examines the role that being a 'representative' plays in competitive behavior of men and women. In fact, a defining feature of many male dominated positions is that they require individuals to compete on behalf of others (e.g. voters, investors, stockholders and employees) in traditionally male domains. Based on competition research alone, women appear to be at a major disadvantage given that they are significantly more likely to opt out of mix-gender competitions that involve performing in stereotypical male tasks (Niederle & Vesterlund, 2007). At the same time, negotiation research finds that while women are more likely to opt out of negotiations when only representing their own interests, they become particularly "energized" in negotiations when representing others (Bowles, Babcock, & McGinn, 2005). Through a laboratory experiment, this study bridged the gap between the competition and negotiation research and examined how having to compete on behalf of others in male domains influences women's willingness to "lean in".

In the treatment condition, female and male 'representatives' were asked to decide whether they choose to enter into a tournament that involved performing in a male-typed task. These 'representatives' were responsible for the payoff of someone else, their 'constituents', in addition to their own. Whereas, in the control group, individuals faced the exact same tasks and decisions, but were only responsible for their own payoffs. With a significant majority of study participants being Harvard University students, unlike previous competition experiments, men and women in the control group exhibited very similar performance and competition behaviors.

This baseline places this study in a unique position to examine how the responsibility of representing another person's interests influenced the competitive behavior of similarly ambitious and qualified men and women, such as men and women in leadership positions. Comparing the treatment and control conditions, I found that not only were women not eager to enter into competitions when charged with representing others, but they *leaned out*: controlling for performance, female 'representatives' were significantly less likely to enter into tournaments than self-representing women. In addition, female 'representatives' did not significantly increase their performance, while male 'representatives' were the ones who were "particularly energized" and experienced a boost in their performance levels as compared to the self-representing men.

The leaning out of female 'representatives' from competition entry was largely attributed to women setting a higher bar for themselves when charged with representing another individual as compared to self-representing women. Also, compared to male 'representatives', female 'representatives' were significantly less confident in their abilities, which explained the gender gap in competition entry amongst other-representing individuals. These insights are in line with existing field research that has found highly qualified women to be setting high bars for themselves and have lower confidence in their abilities with regard to their political and entrepreneurial ambitions (Fox & Lawless, 2011; Lawless, 2012; Thebaud, 2010) – both, traditionally male domains where women's performance in their competitions with men would also have externalities on others.

These findings contradict the prevalent hypothesis that "just as women have been found to opt out of negotiations, and yet be willing to negotiate on behalf of others, it may be that they are more eager to compete when doing so benefits others" (Niederle & Vesterlund, 2011). It turns out that women had no problem entering into competitions when only representing their

own interests, but as ‘representatives’, they leaned back and shied away from competing with men. This behavior, driven by women’s decreased confidence and higher expectations for themselves when representing others, contributes to the understanding of why gender gaps in many competitive stereotypically male domains continue to persist. Therefore, for women to “lean in”, meaningful interventions need to be designed and implemented to enhance their likelihood of overcoming the factors that cause them to lean out.

### **1.3. Essay 2: Descriptive Norms and Gender Diversity: Reactance from Men**

In Essay 2, my coauthors and I examine the impact of descriptive norms on gender diversity in hiring by studying whether employers are more likely to hire more of one gender when informed that others have done so as well. We conducted a series of lab experiments to study how norms in hiring decisions that involve both male and female employees for stereotypical male and female tasks influence others’ identical hiring decisions. When we did not invoke any descriptive social norms and provided no information on what other employers have done, neither male nor female employers showed significant stereotypical hiring tendencies (even though directionally, male employers tended to choose employees stereotypically).

However, when describing what others have done, male employers tended to “correct” for others having chosen more women than men: they chose more male employees when others had chosen more women in both, the male-typed math and the female-typed verbal task. This male reactance was more pronounced when the gender diversity norm was framed with women being in the gain position. Conversely, male employers were not affected when others had chosen more men and did not “correct” for the prior behavior of others who had favored men.

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

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

On the other hand, reactance against women has been implied in many situations when women appear to be favored. For example, Dezso, Ross, and Uribe (2016) found that once a company hires a woman to a top-tier job, the probability of a second woman to land a top position at the same firm drops by about 50 percent – though, companies with female CEO's did slightly better in this regard. Gender quotas seem to also yield a backlash response. In a field experiment, in India Beaman et al. (2009) found that male villagers increase their relative

preference for male leaders (compared to female leaders) whenever their village council has experienced a gender quota. Moreover, Leibbrandt, Wang, and Foo (2015) found that subjects who have been advantaged by quota receive backlash from coworkers.

At the same time, our experiment differs in important dimensions from these interventions in the field. First, we use a norm nudge that does not impose any policy mandates such as a quota system. In addition, we did not start out with employers having very gender biased preferences in the control conditions. Thus, there was little to ‘correct’ to start with. In contrast, the fractions of female political and business leaders and male elementary school teachers rarely surpass 20 percent. By studying majority female (and majority male) groups, we might have created more male reactance than what we would have observed if the fraction of women was increased from, say about 10 to about 25 percent, as was done for corporate boards in the UK.

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

#### **1.4. Essay 3: Changes in Men’s Gender Attitudes: Evidence from Post-Revolutionary Egypt**

Essay 3 examines changes in men’s gender attitudes within the Middle Eastern cultural context. Garnering men’s support and cooperation is a key requirement for achieving gender equality. In fact, research has shown that attempting to even gently nudge men towards making more gender diverse decisions without shifts in their internalized gender attitudes could lead to

backlash against women (Paryavi et al., 2016). However, while the role and origins of gender attitudes have received much attention in recent years, little progress has been made in understanding *changes* in men's attitudes towards women's role in society, especially in the Middle East and North African context. This essay utilizes the disturbance of the status quo brought on by the 2011 Revolution and its tumultuous aftermath to study shifts in gender attitudes of Egyptian men—individuals who hold most leadership positions in Egypt and play a critical role in determining women's access to economic and political opportunities.

The results revealed that, all else equal, the political crisis in Egypt was highly correlated with men adopting more egalitarian gender attitudes. Egyptian men in the midst of the crisis were significantly more likely to have confidence in women's political leadership abilities, accept married women's employment and support girls' university education as opposed to their counterparts right after the Revolution. They also experienced the most significant positive changes in these gender attitudes than other Arab men in the region.

Further analysis reveals that support for girls' university education (i.e. a mostly gender-neutral domain in Egypt) significantly increased only amongst men from financially struggling households and was highly associated with their amplified concerns regarding the availability of suitable employment for women. In contrast, men's greater confidence in women's political leadership and support for women's workforce entry (i.e. both traditionally male domains) was not associated with their increased political or economic grievances, but with the decreased credibility of religious leaders.

At the same time, men's updated gender attitudes do not appear to be part of broader changes in their worldviews towards a more "modern" and "secular" outlook as a result of the failures of the post-Revolutionary religious government. While a greater share of men supported

a political system that is not influenced by religious leaders, both individuals with secular and non-secular political orientations significantly increased their backing of egalitarian gender attitudes. In addition, support for political role of Islam and for personal status laws of marriage and divorce to be in accordance with Islamic law remained high amongst both secular and non-secular individuals, with non-secular men gravitating towards more conservative interpretations of Islam.

These insights combined with the fact that both secular and non-secular men increased their backing for gender equality in the turbulent aftermath of the Egyptian Revolution, conforms to the idea that men may have updated their gender attitudes in order to allow for more favorable treatment of women within Egypt's Islamic cultural context. These changes in gender attitudes could be driven from the reduced credibility of religious leaders and their traditional messages, which promoted extreme masculine patriarchal ideologies that sought to limit women's involvement in the public sphere. Furthermore, the significant media coverage of many Arab women's unrelenting political involvement and the increased dialogue about the extreme marginalization and mistreatment of Egyptian women after the Revolution could have also encouraged men to update their attitudes towards women's participation in politics and the labor force.

These findings have important implications for gender equality policy design in the region. The results suggest that for interventions to be effective in garnering men's support in the cultural context of MENA, it would be important for them to make a case for women's empowerment that is in line with the teachings and understandings of Islam. This is especially important with regard to women's greater participation in traditionally male domains such as politics and the labor force. With respect to increasing support for girls' university education



amongst men from financially struggling households, emphasis needs to be made on the importance of university education in improving girls' chance of competitiveness and achieving financial security in the future.

Given men's influence in Egyptian society as in elsewhere in MENA, the observed changes in their gender attitudes in the aftermath of the Egyptian Revolution, in time, could lead to shifts in behaviors and social norms, which could improve women's status in the household and their access to opportunities in the public sphere. In fact, during the 2015 parliamentary elections, 75 women were elected, which was a record for Egypt and a significant increase from the 10 women who were elected 2012 (Inter-Parliamentary Union, 2016). Time and future research will have to tell whether the changes in men's gender attitudes in the aftermath of the Revolution will translate into more consistent efforts to encourage women's greater participation in the public sphere, leading to lasting changes in behaviors, norms and the status of women in Egypt.

## **Chapter 2:**

### **Competing on Behalf of Others:**

#### **Women Lean Out**

## 2.1. Introduction

Women continue to be drastically underrepresented in leadership positions, especially in politics and business. As of January 2016, only 22 percent of all national parliamentarians were women, which reflects a slow increase from 11.3 percent twenty years ago (Inter-Parliamentary Union, 2016). In the US, women hold only 20% of senate seats, are 4.8% of Fortune 500 CEOs, and serve on 16.9% of corporate boards (Catalyst Research, 2014a, 2014b; Curtis & Thornton, 2013-2014; Rutgers University, 2016). Women have been encouraged to “lean in” (Sandberg, 2013) to help close some of these gender gaps. However, a defining feature of these leadership positions is that they require individuals to compete on behalf of others (e.g. voters, investors, stockholders and employees) in traditionally male domains. The existing literature is unclear about how this feature could be influencing women’s advancement. Based on competition research alone, women appear to be at a major disadvantage given that they are significantly more likely to opt out of mix-gender competitions that involve performing in stereotypical male tasks (Niederle & Vesterlund, 2007). At the same time, negotiation research finds that while women are more likely to opt out of negotiations when only representing their own interests, they become particularly “energized” in negotiations when representing others (Bowles, Babcock, & McGinn, 2005). This paper aims to bridge the gap between the competition and negotiation research and examine how having to compete on behalf of others in male domains influences women’s willingness to “lean in”.

In the field, by surveying mutual-fund managers (another cohort in which women are underrepresented), Beckmann and Menkhoff (2008) found that female financial experts were more averse to competition and less likely to choose a strategy that could allow them to outperform the market. While mutual-fund managers are clearly responsible for the financial

interests of others in a male-dominated field, the role that being a representative plays in competition decisions of men and women remains uncertain. In negotiation experiments, given the social and face-to-face environment, there is possibility of backlash when women are assertive for their own benefit, which has been argued to be the main deterrent for women in negotiation settings (Amanatullah & Morris, 2010; Bowles, 2012). However, when negotiating on behalf of others women can be assertive without fearing backlash from their counterparts for taking an assertive “agentic” role (i.e. a stereotypical male behavior) given that they were required to negotiate for someone else’s benefit (Bowles et al., 2005). In contrast, in competition experiments, individuals are not in direct contact with one another, receive no feedback on others’ performance or choices, and thus, experience no possibility of backlash.

If individuals were required to represent another individual in a competition environment, many other factors besides fear of backlash could influence their behavior. For instance, gender differences in other-regarding preferences may determine if and under what conditions women would be willing to compete with men (Croson & Gneezy, 2009; Kamas & Preston, 2010; Niederle & Vesterlund, 2011). In addition, women’s confidence has been shown to shift with differing circumstances and tasks, with women holding less confident beliefs about their relative ability in high-pressure stereotypical male domains (Shurchkov, 2012). Combined with women consistently having lower confidence in their abilities as compared to men (Balafoutas & Sutter, 2010; Beyer & Bowden, 1997; Healy & Pate, 2011; Niederle & Vesterlund, 2007; Sutter & Rützler, 2010), the added pressure of representing another person in a male domain could decrease women’s confidence and deter them from entering competitions. At the same time, research suggests that women are more altruistic than men (Croson & Gneezy, 2009), and more likely to consider representations of others as part of the self (Cross & Madson, 1997), which

could shift women's attitudes towards performing in a competition, encouraging them to take on the additional pressure for the sake of increasing winnings for their constituent.

To examine whether women “lean in” and become more competitive when representing others in a male domain, I conducted laboratory experiments in a mix-gender competitive environment, as in Niederle and Vesterlund (2007). The experiment design allowed for careful examination of individual behaviors as well as the contributing factors—such as confidence, risk and feedback aversion, and attitudes towards competition. In the treatment condition, female and male ‘representatives’ were asked to decide whether they choose to enter into a tournament that involved performing in a male-typed task. Similar to Bowles et al. (2005), these ‘representatives’ were responsible for the interest of someone else, their ‘constituents’, in addition to their own. Whereas, in the control group, individuals faced the exact same tasks and decisions, but were only responsible for their own interests.

A significant majority of study participants were Harvard University students, with no significant differences in their levels of confidence when only representing themselves. Unlike previous competition experiments, men and women exhibited very similar performance and competition behaviors in the control group. This baseline comparison provides a unique opportunity to examine how the competitive behavior of similarly ambitious and qualified men and women—such as men and women in leadership positions—is influenced by the responsibility of representing another person's interests.

My results suggest that not only were women not eager to enter into competitions when charged with representing another, but that they leaned *out*. Controlling for differences in performance, female ‘representatives’ were less likely to enter into tournaments than male ‘representatives’ and self-representing women. In addition, female ‘representatives’ did not

significantly increase their performance, while male ‘representatives’ experienced a boost in their performance levels as compared to the self-representing men. The leaning out of female ‘representatives’ from competition entry is largely attributed to women setting a higher bar for themselves when charged with representing another individual as compared to self-representing women. Furthermore, compared to male ‘representatives’, female ‘representatives’ were significantly less confident in their abilities, explaining the gender gap in competition entry amongst other-representing individuals. These insights are helpful in understanding the persistence of gender gaps in leadership positions and many other areas that require men and women to compete in a traditionally male domains while representing the interests of others.

The following sections present the conceptual framework (Section 2.2), experimental design (Section 2.3), results (Section 2.4), explanations of the results (Section 2.5), and concluding remarks (Section 2.6).

## **2.2. Conceptual Framework**

Studies have shown that women are significantly more likely to opt out of mix-gender competitions and competitive negotiations when only representing their own interests (Bowles et al., 2005; Niederle & Vesterlund, 2007, 2011). However, in one negotiation study, women were found to become particularly energized when charged with representing the interest of another (Bowles et al., 2005). To understand how women may behave when they are also representing another individual in a competitive environment as in the Niederle and Vesterlund (2007) study, key differences between previous negotiation and competition settings need to be considered.

First, while representing another individual may reduce the effects of a constraint responsible for the gender gaps in negotiation experiments, that constraint may not be present or binding in competition experiments. In the negotiation literature, the possibility of backlash has

been identified as a significant deterrent for women in negotiations (Amanatullah & Morris, 2010; Bowles, 2012), which is expected to be greatest when women are assertive for their own benefit, contradicting communal prescriptions for female behavior (Rudman, 1998; Rudman & Glick, 1999). Hence, in negotiation settings, which are conducted face-to-face in a social environment, negotiating on behalf of others and someone else's benefit may give women a boost and energize them to negotiate assertively without fearing backlash from their counterparts for taking an "agentic" role (i.e. a stereotypical male behavior) (Bowles et al., 2005). However, participants in competition experiments experience no possibility of backlash given that they remain anonymous, have no direct contact with their multiple competitors, and receive no feedback on others' performance or choices. They also do not experience a possibility of social approval given that no one will know (besides the experimenter, of course) how well they performed. This suggests that women would not be expected to experience a boost in their performance or competition entry from the reduced threat of backlash brought on by representing another person in a competition experiment.

Secondly, a fundamental feature of the Niederle and Vesterlund (2007) experiment was that individual choices imposed no externality on the payoffs of others, therefore reducing the effect of other-regarding preferences (Niederle & Vesterlund, 2011). However, while individual incentives would remain constant, if individuals are also in charge of representing the interest of another person, the size of the pie would be doubled and their choices would impose an externality on the payoff of another person. Individuals may respond to either the ability to help another person, the larger pie, or both, which could shape their competition behavior. Numerous studies reveal that men are more likely to be social-surplus maximizers and women are more inequality averse and altruistic (Croson & Gneezy, 2009; Kamas & Preston, 2010; Niederle &

Vesterlund, 2011). Furthermore, Kamas and Preston (2010) find that even in a no-externality environment similar to the Niederle and Vesterlund (2007) experiment, individuals who were social-surplus maximizers were more likely to enter into the tournament as compared to inequity averse individuals. Therefore, if individual choices imposed externalities for the payoff of another individual, given women's tendencies to be altruistic and more concerned with equalizing earnings, they may prefer that their constituent earn at least some payoff rather than none. As a result, women would be less likely to enter into a tournament that could have a zero payoff outcome when representing another individual than if they were only representing themselves.

Furthermore, throughout the competition literature, gender differences in beliefs about relative ability (i.e. confidence) and attitudes towards performing in a competition are identified as the main reasons for the gender gap in competitiveness (Niederle & Vesterlund, 2011). These could also interact with individuals' other regarding preferences when serving as representatives. In addition, risk and feedback aversion may also be activated although they have been found to play a negligible role in competition experiments. These factors will be discussed in the Section 2.2.1 to examine how representing another individual in a competition environment is expected to shape competition entry decisions. Subsequently, Section 2.2.2 discusses possible changes in competitive performance, another measure of competitiveness, as a result of the representation role.

### **2.2.1. Differences in Competition Entry under Representation**

#### *2.2.1.A. Role of differences in confidence*

Women have been shown to be less confident than men regarding their relative abilities (Beyer, 1990; Beyer & Bowden, 1997; Pulford & Colman, 1997; Soll & Klayman, 2004),



especially in stereotypical male domains (Grosse & Riener, 2010; Kamas & Preston, 2010; Lundeberg, Fox, & Punčohaf, 1994). In fact, Niederle and Vesterlund (2007) and others (Balafoutas & Sutter, 2010; Dargnies, 2011; Healy & Pate, 2011; Niederle & Vesterlund, 2010; Shurchkov, 2012; Sutter & Rützler, 2010) directly measure the impact of beliefs about relative ability. They find that women are less confident than men and that these beliefs help explain some of the gender gap in tournament entry. Cason, Masters, and Sheremeta (2010), Wozniak, Harbaugh, and Mayr (2009), Ertac and Szentes (2010) also assess the role of beliefs about relative ability by manipulating beliefs directly and providing feedback about the performance of others before the decision to enter a tournament was made. They all find that the gender gap in tournament entry is reduced or completely eliminated when information about the performance of others is provided.

Moreover, men's confidence seems to be derailed less by tasks or circumstances that may shift women's confidence. Wozniak et al. (2009) found no gender difference in confidence in a stereotypically female word task (with men being just as confident as women in this female-typed task), and that men were significantly more confident than women in the math task – the difference being due to women being less confident in math (a stereotypical male task). In fact, Lundeberg et al. (1994) argue that gender differences in beliefs about relative ability exist mostly in masculine domains. Fox and Lawless (2011) also hold that the lower confidence of eligible female electoral candidates can be linked to women's perceptions of the political environment as being sexist and masculinized. In the laboratory as well, the gender gap in confidence and entry is larger in tasks that are stereotypically male (e.g. math tasks vs. word tasks; see Kamas and Preston (2010), Grosse and Riener (2010)) when subjects believe that women are better at the verbal tasks and men better in the math task.

Additionally, Shurchkov (2012) varies the time limit allowed for completing tasks to create high-pressure and low-pressure environments. She found that women were more likely to enter a tournament for a low-pressure verbal task, possibly suggesting that they were more confident in their abilities in low-pressure familiar environments. Women have also been shown to raise their expectations of themselves in traditional male domains and when the stakes are high. For example, when assessing their readiness to pursue elective office, women set an extremely high bar for themselves (Fox & Lawless, 2011; Lawless, 2012). Thebaud (2010) also found that when compared to similarly situated men, women hold themselves “to a stricter standard of competence” and are considerably less likely to view themselves as able to be an entrepreneur. Moreover, in studying gender differences in willingness to guess on tests, Baldiga (2013) finds that women are significantly less likely to guess and answered fewer questions than men when facing a penalty for wrong answers, whereas they answered all questions when there was no imposed penalty.

Therefore, given the gender differences in other regarding preferences, the higher stakes involved when representing another individuals’ interests could lead women to set a higher bar for themselves, encouraging them to only compete if they are confident that they will win and increase their payoff and those of their constituent. Additionally, stereotype threat may be implicitly activated for women in high-pressure stereotypically masculine domains (e.g. representing someone else while performing a math task). While stereotype literature (Spencer & Steele, 1999; Steele & Aronson, 1995) focuses on performance evaluation in non-competitive environments, stereotype threat may be contributing to gender differences in beliefs about relative ability in a competition involving a stereotypically male math task. If stereotype threat is

activated, women may expect to not perform as well as men, which could also shift their beliefs about their relative performance.

Overall, the exact mechanism behind shifts in women's confidence is unclear. However, given the additional pressure and responsibility of representing someone else, women are expected to experience lower confidence levels when serving as 'representatives' in a stereotypically male domain than if they were to only represent themselves. In contrast, men's confidence is expected to remain constant across different settings. Furthermore, all else equal, women's lower level of confidence as 'representatives' is projected to deter them from entering into competition, leading to a significant increase in the gender and treatment gap in competition entry.

#### *2.2.1.B. Role of differences in attitudes toward performing in a competition*

The competition literature contends that men and women hold significantly different preferences for entering competitions that require them to subsequently perform in a task. Women are considered to be more likely to elect out of situations that require them to perform in a competition (Niederle & Vesterlund, 2007), while men may even be drawn to them. It has been theorized, "while the prospect of engaging in a future competition may cause women to anticipate a psychic cost and deter them from tournaments, men may anticipate a psychic benefit" (Niederle & Vesterlund, 2007, pg. 1070). This could be a result of girls and boys experiencing different upbringings, where typically girls are encouraged to show empathy, be fair and considerate of others, and boys are encouraged to be assertive (Ruble, Martin, & Berenbaum, 2006). Evolutionary psychology also lends support to this theory by using reproductive strategies of each gender to argue that men have "evolved" to enjoy competition (Campbell, 2002; Daly & Wilson, 1983). Following from their analysis, Niederle and

Vesterlund (2007) argue that gender differences in attitudes toward performing in competition explain a significant portion of the gender differences in tournament entry.

Despite these established differences in attitudes towards performing in a competition, the theory is unclear on whether women would be encouraged to be assertive or to lean out of entering a competition when representing the interest of another individual. Given the added requirement of representing another and the larger stakes, female ‘representatives’ may become even less drawn to the pressure of performing in a competitive setting and as a result, shy away from entering competitions that require them to perform. In contrast, the added pressure may excite men even more and increase their likelihood of competition entry.

At the same time, considering the fact that women are found to be more altruistic than men (Croson & Gneezy, 2009), they could be encouraged to take on the additional pressure for the sake of increasing winnings for their constituent, and choose to perform in a competitive setting. This is also supported by the literature on gender and interdependent self-construal. While men are thought to consider representations of others as separate from themselves, women are thought to construct interdependent self-construal, where they consider others as part of themselves (Cross & Madson, 1997). This may serve to shift women’s attitudes towards competition, energizing them to compete if they felt a personal responsibility to represent the interests of another person (Bowles et al., 2005). It is even likely for both of these forces to be at play with some women being encouraged to compete by the representation role, and others being discouraged by the added pressure. While the exact mechanisms behind shifts in attitudes towards performing in a competition are not under examination here, the experiment under consideration allows for specifically identifying the impact of differences in attitudes towards competition when representing another individual.

### 2.2.1.C. Role of differences in risk attitudes and feedback responses

When considering gender differences in risk attitudes, the economics literature generally finds that women are more risk averse than men both in the lab with low stakes and the field where higher stakes are involved (Croson & Gneezy, 2009; Eckel & Grossman, 2008). In terms of whether gender differences in risk attitudes affect competitiveness, a series of studies show that it plays a limited role in explaining gender differences in tournament entry. Niederle and Vesterlund (2007) and Healy and Pate (2011) provided participants with a choice that mimics the risk of the tournament-entry decision, and found risk aversion to be an insignificant factor. Cason et al. (2010), Wozniak et al. (2009), Sutter and Rützler (2010) control for risk aversion by directly asking participants to make a series of choices over incentivized lotteries, and also find that their measures do not explain the gender differences in entry. Similarly, studies in the psychology literature suggest that women tend to internalize negative feedback more than men (Dweck, 2000; Roberts & Nolen-Hoeksema, 1989), and thus, would be more averse to environments where they would receive feedback on their relative performance. However, in their analysis Niederle and Vesterlund (2007) find that feedback aversion also plays a negligible role in explaining gender differences in the choice to enter the tournament.

Given that the literature does not support strong *within* gender variations, it is not likely for the representation role to noticeably shift women's risk and feedback preferences. In other words, it is not expected for other-representing women to have significantly different risk and feedback preferences from self-representing women and, for these preferences to be shaping competition entry decisions.

In summary, based on the outlined conceptual framework so far, the effects of risk and feedback aversion on competition entry when representing another individual in a stereotypically male domain are expected to be minimal. In addition, differences in attitudes towards performing in a competition could energize male ‘representative’ competition entry, while the impact on women could be mixed. However, women ‘representatives’ are expected to hold significantly less confident beliefs about their relative ability, which would discourage them from entering into competitions. In contrast, men are expected to remain relatively more confident regardless of the setting, with confidence not being a determining factor for male ‘representative’s’ choice to enter into competition. In addition, as likely social-surplus maximizers, men may be more likely than women to enter into competitions when representing another individual in their effort to maximize payoffs for both participants. Whereas, women’s tendency towards altruism and equalizing earnings could discourage them from entering into a tournament that could have a zero payoff outcome for the individual they are representing. Combined with gender differences in beliefs about relative ability, this lends support to the expectation that women may set the bar high for themselves to be amongst the top performers in order to enter into competitions when representing another individual.

Therefore, given the strong expected shift in confidence, coupled with women’s other-regarding preferences, controlling for differences in performance (discussed below), it is expected for female ‘representatives’ to experience lower rates of competition entry as compared to self-representing women (*Hypothesis 1.A*). In addition, a significant representation effect on men’s likelihood to enter into competition is not expected (*Hypothesis 1.B*).

### **2.2.2. Differences in Performance under Representation**

Niederle and Vesterlund (2007) found no significant gender differences in performance in mix-gender competitive and non-competitive environments. Performance in the male-typed math task was also not very responsive to the small differences in the incentive schemes. However, when individuals are required to perform on behalf of others, their individual incentives remains constant, but the size of the pie is doubled as it involves the payoffs of another individual. Therefore, being charged with the responsibility of earning for someone else increases the financial stakes and places added pressure on the ‘representatives’.

Laboratory and field studies seem to suggest that the gender performance gap increases with competitive pressure, with men’s performance improving and women’s performance not improving or diminishing (Niederle & Vesterlund, 2011). Shurchkov (2012) compares gender differences in performance in math (i.e. stereotypically male) and verbal (i.e. stereotypically female) tasks. She finds that in a mix-gender high-pressure treatment where subjects are allowed less time to solve each problem, the gender difference in the math task increased, with women reducing their performance in the tournament, and there was no gender difference in the verbal task. In addition, when representing others in a male domain, not only is the task at hand stereotypically male, but also perhaps, even the role of the individual as a ‘representative’. This suggests the possibility of stereotype threat being activated for women ‘representatives’ in this high-pressure environment that involves a male-typed task and role, and thus, hindering women’s performance (Kiefer & Sekaquaptewa, 2007; Nosek, Banaji, & Greenwald, 2002; Spencer & Steele, 1999; Steele & Aronson, 1995).

Furthermore, Paserman (2007) found that when evaluating point-by-point data from Grand Slam tennis tournaments, women were more likely to make unforced errors when the

stakes were higher at crucial junctures of the match. In addition, in examining responses to a competitive fellowship program that awards graduate students who make quick advance to candidacy, J. Price (2008) found that this competition on speed had no effect on the time to candidacy for female students, while leading to substantial and significant decrease in time to candidacy for eligible male students. Moreover, Attali, Neeman, and Schlosser (2011) document a greater gender gap in performance on the GRE in a real and competitive setting than in an experimental and low-stakes environment. They attribute this to men responding more strongly to decreased incentives in the experimental GRE and performing better in a high stakes environment.

Following these insights, it is reasonable to expect shifts in the performance of men and women given the higher stakes involved when individuals are required to represent another individual in a mix-gender competitive environment involving a male-typed task and role. Specifically, either no change or a decrease in female ‘representative’ performance as compared to self-representing women (*Hypothesis II.A*), and either no change or a boost in male ‘representative’ performance as compared to self-representing men is expected (*Hypothesis II.B*).

The following section presents the experiment where I tested the impact of being a ‘representative’ on tournament entry and performance and identified the specific reasons behind any observed gender and treatment differences.

### **2.3. Experimental Design**

I examined the effect of representing others on competitive behavior and performance of men and women using a laboratory environment with a between-subject experiment design. Individuals were randomly assigned to either a control or treatment condition (Table 2.1). The



‘self-representation’ control condition aimed to establish a baseline for competitive performance and behavior when individuals only represent their own interests. The control condition was then compared to the ‘other-representation’ treatment condition, where individuals faced the same tasks and decisions as in the control condition, but they were also responsible for the payoffs of another study participant. The individual treatment conditions and experimental procedures are explained in turn.

Table 2.1: Experiment treatment and control groups

Condition	Number of Female Participants	Number of Male Participants	Number of Constituents
Self-Representation Control	40	40	None
Other-Representation Treatment	40	40	40 Men & 40 Women

### 2.3.1. Self-Representation Control Condition

The self-representation control (SRC) condition followed the Niederle and Vesterlund (2007) mix-gender competition design and was computerized using Z-tree software program (Fischbacher, 2007).<sup>1</sup> Study participants were seated in groups of four in the laboratory, consisting of two men and two women in each row of cubicles. As in the Niederle and Vesterlund (2007) design, gender was not explicitly mentioned in the experiment, but the participants were able to see their competitors who were seated in the cubicles next to them. At the same time, each participant had their own computer terminal that was separated by partition walls so they could not see each other’s computer screens, performance or decision information.

Individuals were asked to participate in a real math task, which involved adding up a row of five two-digit numbers. Previous studies that measure explicit gender attitudes (C. R. Price, 2012) and utilize implicit association tests (Nosek et al., 2002) show that math is generally

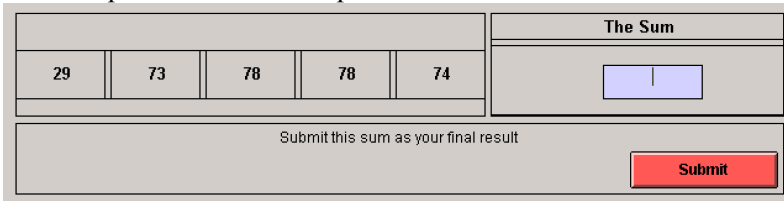
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<sup>1</sup> I thank Muriel Niederle and Lise Vesterlund for sharing their Z-tree code.

perceived to be a stereotypically male domain. Therefore, the math task fits the study’s objective to understand how women and men behave in stereotypically male domains.

The numbers were randomly drawn and participants were asked to fill in the sum of these numbers in the blank box and press “Submit” for a new problem to appear (Figure 2.1). Subjects were given five minutes to complete the task under four different compensation schemes. Each of the five-minute trials was referred to as a “Task” and performance was defined as “number of correctly solved problems” on a task. Participants received details on each task individually, right before they were asked to perform the specific task. They were also informed of their own performance during each task (number of problems solved correctly and incorrectly), but did not receive any information on the performance of other participants until the end of the study.

Figure 2.1: Computer screen of sample math task



Task 1 allowed participants to gain practice with the task without needing to make any decisions with regard to the compensation scheme and competition. Subjects performed the math task under a noncompetitive piece-rate, earning \$0.50 per correctly solved problem. Task 2 allowed individuals to gain experience with the task in a competitive environment, but again, without needing to make any decisions about competition entry. All subjects were asked to perform the math task in a tournament amongst their four-person group. The person with the highest score received \$2 per correct problem and the others received nothing. In case of a tie, the computer program chose the winner randomly. The outcome of this tournament was announced at the end of the experiment.

After participating in the piece-rate and tournament-compensation schemes, individuals were asked to choose which payment scheme (piece-rate or tournament) they preferred for the third Task. Therefore, Task 3 was the competition entry environment. If participants selected the tournament-compensation, their performance in this task was compared to the performance of the three other group members from the previous tournament (Task 2). Hence, their choice would not influence their team members' payoffs, which eliminated concerns about other-regarding preferences. Once the decision for Task 3 was made, they proceeded to perform the math task for five minutes.

To control for beliefs about relative ability, risk and feedback aversion, while eliminating factors such as competitive attitudes that shape preferences for performing in a competitive environment, participants were required to perform an additional task. Task 4 mimicked the competition-entry choice in Task 3, but did not require individuals to perform in a tournament. Participants were asked to choose between a piece-rate and tournament-compensation scheme for an already completed task: their Task 1 performance. After the Task 4 decision was made, to assess beliefs about relative ability, participants were asked to rank their performance in Task 1, Task 2 and Task 3 relative to that of other group members. Individuals could earn an extra \$3 as those who correctly ranked their performance on each task received \$1 for each correct ranking.<sup>2</sup> At the end of the experiment, one of the four tasks was randomly chosen for payment. Hence, controlling for performance, beliefs about relative ability and the decision in Task 4, any gender gap in the Task 3 choice to enter into the tournament can be attributed to differing attitudes towards having to compete against others.

The self-representation control (SRC) condition was conducted in twelve sessions of either one or two, four-member competition groups at the Harvard Decision Science Laboratory

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<sup>2</sup> In the event of a tie, participants were compensated for any guessed ranking that could be correct.

in Cambridge, MA with a total of 80 study participants (40 men and 40 women). This totaled twenty competition groups. Participants were provided with four sheets of blank white paper and a pen, as calculators were not allowed. Standard recruiting procedures were used and only students were allowed to sign up for the study, majority of which were Harvard University students. This was to generate a homogenous sample of generally equally ambitious and qualified individuals to tackle this experiment. This was also in response to pilot sessions that did not include the student restriction on the subject pool and yielded sessions with mostly female Harvard students and significantly older male seniors competing against each other.

The experiment lasted approximately forty-five minutes. All participants remained anonymous throughout the study, and were only identified by their randomly assigned code numbers. The instructions were read out loud and can be found in Appendix A. The math task was described to the participants and for each task, their decision and the procedure to determine their earnings was explained. Participants were informed of their earnings at the end of the study. Subsequently, they were asked to answer a demographic questionnaire and were paid in cash (their study earnings plus a \$5 show-up fee and a \$7 participation fee) at the end of their session. Average earning per participant was \$22.49.

### **2.3.2. Other-Representation Treatment Condition**

To test the impact of representing others on competitive performance and behavior, the other-representation treatment (ORT) replicated the design of the self-representation control condition with only one difference: the participants who performed Tasks 1 through Task 4 were also required to represent the interests of another study participant in addition to their own (i.e. their payoffs also determined the payoffs of another individual). Therefore, the only difference

between the self- and other-representation conditions in terms of monetary payoff was that ‘representatives’ in other-representation treatment worked for a higher payoff for another randomly assigned study participant who remained anonymous, but was physically present in the room. As in Bowles et al. (2005) where individuals represented the interests of someone else in a negotiation setting, the individual economic incentives were held constant across the control and treatment conditions but the amount of earnings was added to the constituent’s earnings in the treatment condition. Hence, while individual incentives remained constant across the two conditions, the size of the pie was increased in the other-representation treatment.

Representatives may thus respond to both features of this treatment: the ability to help someone else and the larger pie, which increases the stakes and pressure.

The other-representation treatment consisted of twenty sessions that were conducted in the Harvard Decision Science Laboratory in Cambridge, MA. As in the self-representation control condition, standard recruiting procedures were used and registration for the study was restricted to students only, which included majority Harvard University students. Each session included eight individuals (total of 160 subjects) who were randomly assigned into two groups of four. Four of the individuals (two men and two women) were the ‘representatives’ who participated in the study and were paid based on their own decisions and performance (as in the control). The remaining four individuals (two men and two women) were the ‘constituents’. They did not participate in the study. Instead, ‘constituents’ performed an alternative coding task for which they were not monetarily compensated and the earnings of a randomly assigned ‘representative’ determined their study payoffs. Previous research in negotiation environments has shown that negotiation behavior of the representative was impacted by the gender of their

constituent (Pruitt, Carnevale, Forcey, & Van Slyck, 1986).<sup>3</sup> To make sure that ‘representatives’ in the other-representation treatment do not know the gender of their ‘constituent’, an equal mix of female and male ‘constituents’ was recruited for each session and they were randomly assigned to each ‘representative’.

Hence, the other-representative treatment consisted of twenty competition groups (as in the control) with eighty ‘representatives’ and eighty ‘constituents’ (40 men and 40 women of each). The terms ‘representatives’ and ‘constituents’ were not used in the experiment. Instead, ‘representatives’ were identified as “yellow-labeled participants” and ‘constituents’ were identified as “green-labeled participants.” Individuals were randomly assigned to either the green- or yellow-labeled cubicles by selecting an index card from a cup when they arrived at the lab and signed in for the study. The cup consisted of randomly ordered and folded white index cards with “green” or “yellow” written inside. At the start of the experiment, individuals with cards that read “green” were asked to sit in the row of cubicles labeled with green sticky notes and those with cards that read “yellow” were asked to sit in the row of cubicles labeled with yellow sticky notes.

All participants were paid a \$5 show-up fee, a \$7 participation fee and additional earnings from the study, which was based on either the individual’s own performance (in the case of ‘representatives’) or a randomly selected individual’s performance (in the case of ‘constituents’). The average earning per participant was \$23.30. As in the self-representation control condition, the experiment was computerized using Z-tree software program, lasted approximately forty-five minutes, all participants remained anonymous throughout the study and the instructions were read out loud and can be found in Appendix A. ‘Constituents’ followed along as the math task was described to the ‘representatives’ and for each task, their decision and

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<sup>3</sup> In Bowles et al. (2005)

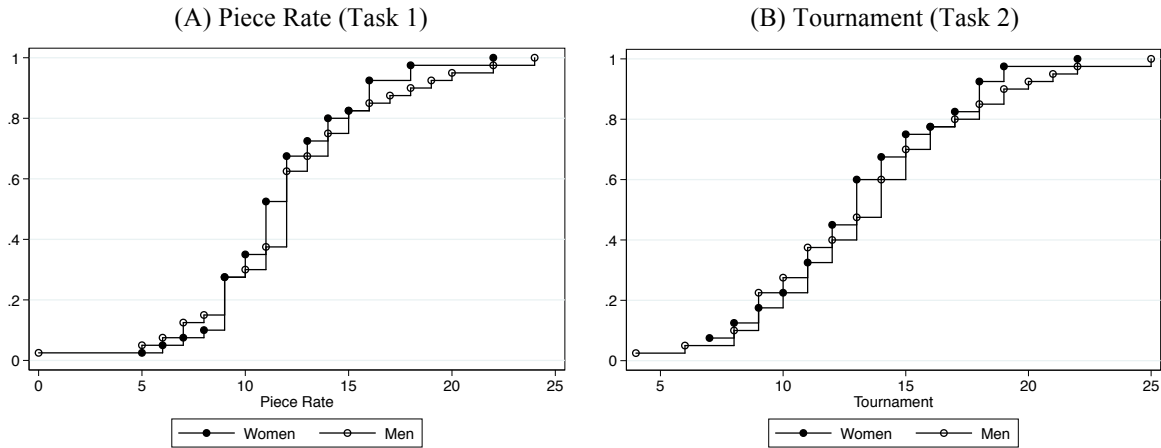
the procedure to determine the ‘representative’s’ earnings and the earnings of their ‘constituent’ were explained. At the end of their session, all participants were informed of their earnings, asked to answer a demographic questionnaire and were paid in cash. The next section discusses the experimental results.

## **2.4. Results**

First, I present individual competitive behaviors in the control condition (i.e. Self-Representation Condition) where the Niederle and Vesterlund (2007) experiment was replicated. I find that female and male participants behaved very similarly, with the likelihood of choosing the tournament compensation scheme (instead of the piece-rate) in Task 3 being 65 percent for women and 67.5 percent for men. Therefore, there is no significant gender difference in the choice to enter into a tournament in the self-representation control condition (a Fisher’s exact test yields  $p$ -value = 0.81). This is in contrast to Niederle and Vesterlund’s (2007) results, which found a significant difference between men and women’s choice of compensation in Task 3 with 73 percent of men and only 35 percent of women selecting the tournament (a Fisher’s exact test yields  $p$ -value = 0.002). This could be due to differences in subject pools. This study was restricted to a student subject pool with 84 percent of participants being Harvard University students, which unlike Niederle and Vesterlund (2007), yielded no significant gender differences in confidence in this control condition (see Section 5). C. R. Price (2010) did not replicate Niederle and Vesterlund’s results either. They also used a student-only subject pool and Niederle and Vesterlund (2011) explain that the C. R. Price (2010) findings were due to lack of

gender differences in confidence levels, perhaps as a result of having a more homogenous student sample.<sup>4</sup>

Figure 2.2: CDF of Number of Correctly Solved Problems, Self-Representation Control Condition



In addition, as shown in Figure 2.2, women and men had very similar performances in both the piece rate round (Task 1) and the tournament round (Task 2). In the piece rate (Task 1), women and men correctly solved an average of 11.8 and 12.3 problems, respectively, with this difference being insignificant using a two-sided t-test ( $p$ -value = 0.65). Similarly, in the Task 2 tournament, women solved an average of 13.2 problems correctly and men solved 13.6 problems. This difference is also statistically insignificant ( $p$ -value = 0.65). Men did demonstrate a larger variance in their piece-rate and tournament performances than women, but only the difference in piece-rate score variances is significant (Variance ratio test,  $p$ -value = 0.08). There is also a strong correlation between performances in the piece-rate and tournament rounds (Spearman rank correlations of 0.67 for women and 0.84 for men); however, both men and women performed significantly better in the tournament than in the piece-rate round (one-sided  $p < 0.01$  for each gender separately). This suggests that both men and women became

<sup>4</sup> Moreover, C. R. Price (2010) found no significant gender differences in competition entry when limiting the scope to only undergraduate students across Niederle and Vesterlund's study and his subject pool.



equally competitive in terms of performance in a competitive environment in the self-representation condition. Though, as Niederle and Vesterlund suggest, this increase in performance could also be due to learning and the different incentives across the two tasks.

Consequently, there were no gender differences in the probability of winning the Task 2 tournament given the similar performances by men and women. In fact, of the twenty Task-2 tournaments, women won 50 percent and men won 50 percent. To evaluate the probability of winning the tournament, I created random four-person groups from the observed performance distributions, following Niederle and Vesterlund (2007). Conditioning only on gender, the probability of winning the tournament was 27.5 percent for a man and 22.5 percent for a woman and this difference is not significant using a Fisher's exact test ( $p$ -value = 0.80). Conditioning on performance, in a sample of those who scored 13 or greater,<sup>5</sup> the probability of winning the tournament is 45.83 percent for a man and 36.36 percent for a woman ( $p$ -value = 0.56). The probability of winning the tournament increases to 52.38 percent for a man and 50 percent for a woman among those who scored 14 or greater ( $p$ -value = 1.00). Therefore, there were no significant gender differences in performance in the Task 2 tournament or in the probability of winning the tournament in the self-representation control condition.

Hence, in the self-representation treatment, men and women behaved very similarly; both in terms of performance in non-competitive (Task 1) and competitive (Task 2) environments and in terms of their choice to enter a competitive environment where they needed to subsequently perform (Task 3). In addition, men and women behaved similarly in their choice to enter into a tournament when they did not need to perform in a competition (Task 4). In fact, 55 percent of men chose to submit their Task 1 piece-rate performance to a tournament (Task 4) and 47.5

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<sup>5</sup> In expected value terms, if individuals solved 12 correct answers, then risk-neutral rational decision makers would be indifferent between choosing the piece rate ( $EV = 12 \times \$0.50 = \$6$ ) or the tournament ( $EV = 12 \times \$2 \times 0.25 = \$6$ ) compensation scheme.

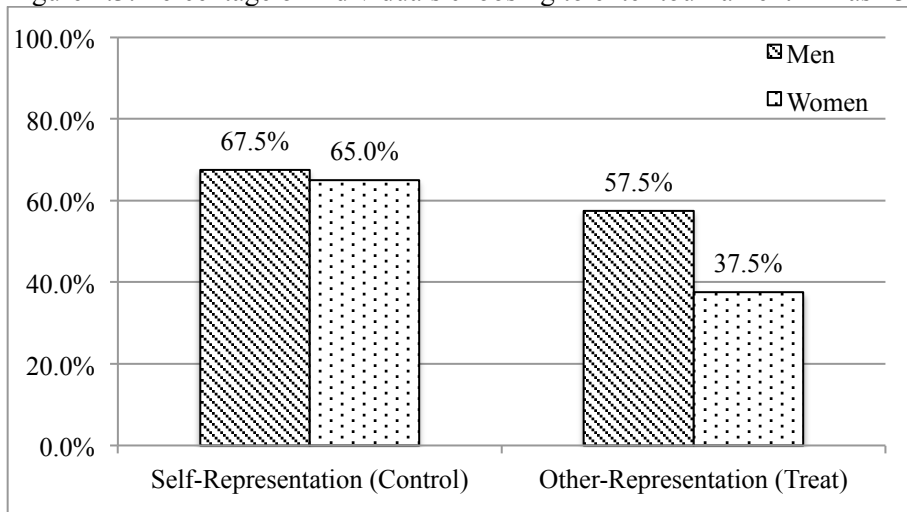
percent of women made the same decision, with no significant gender differences ( $p$ -value = 0.51). Thus, men and women in the self-representation control condition exhibited very similar behaviors across all four tasks and compensation schemes.

This result places this study in a unique position to examine how the competitive behavior of similarly ambitious and qualified men and women, such as men and women in leadership positions, is effected by the added responsibility of representing another person's interests. Accordingly, I present the results of the other-representation treatment next, where individuals faced the same tasks and decisions as in the control condition, but they were also responsible for the interest of another study participant who was randomly assigned to them. Overall, I did not find any evidence in support of the Bowles et al. (2005) competitive negotiation findings being transferred to this competitive environment. Bowles et al (2005) find that women were "particularly energized" when they were responsible for representing the interests of another person, negotiating significantly higher compensations as compared to women who only represented themselves. In contrast, in this competitive environment, I found that not only were female 'representatives' not "particularly energized", but that they *leaned out* when compared to self-representing women. Instead, male 'representatives' were the ones who were "particularly energized" in terms of performance when representing the interests of someone else in a competition. The following sections expand on these results by first presenting a comparison among women across treatment conditions in Section 4.1, then a comparison among men across treatment conditions in Section 4.2, and finally, combining the entire subject pool and presenting the key experimental results in Section 4.3.

### 2.4.1. Self-Representing Women vs. Other-Representing Women

In negotiation contexts, women have been found to negotiate less than men when negotiating on their own behalf, but when representing someone else, women became more competitive and negotiated more strongly. Whereas, in this competitive environment, I started with a different reference point as women showed the same competitive behavior as men when representing themselves (both in terms of tournament entry and performance). However, when women had to represent someone else, they became less likely to enter into a tournament (*Hypothesis I.A*), despite experiencing similar performance across the two conditions (*Hypothesis II.A*).

Figure 2.3: Percentage of individuals choosing to enter tournament in Task 3

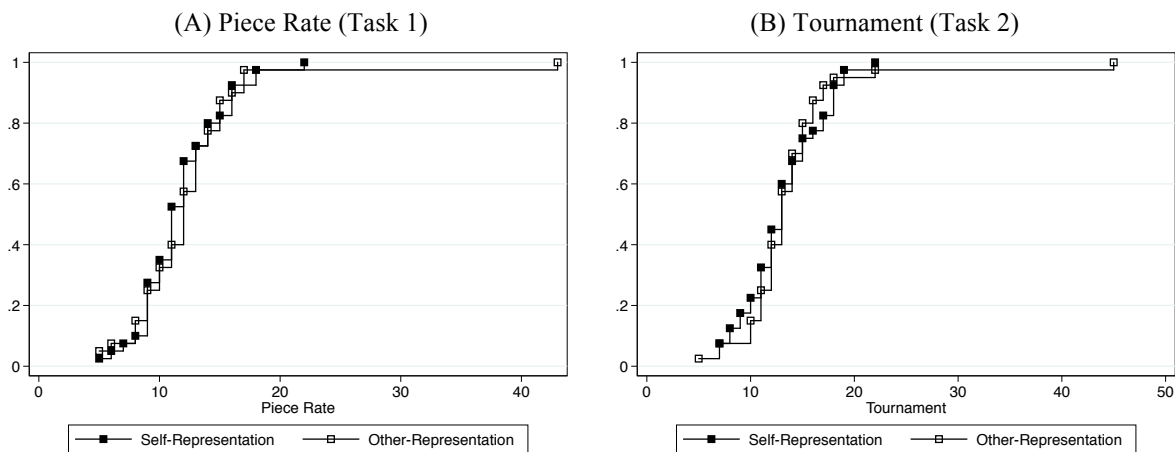


As shown in Figure 2.3, compared to the self-representation control condition where 65 percent of women chose to compete in Task 3, the likelihood of competing significantly declined by 0.28 percentage points to 38 percent for female ‘representatives’ who also represented the interest of another individual (two-tailed Fisher’s exact test,  $p$ -value = 0.025). This was also significantly lower than the 58 percent of male ‘representatives’ who selected to compete in the other-representation condition (one-tail Fisher’s Exact Test,  $p$ -value = 0.058). Hence, not only

were female ‘representatives’ not “particularly energized” in this competitive environment, but they *leaned out* and shied away from entering into competitions.

This is despite the fact that women exhibited similar performance patterns across treatment conditions, with no significant differences in their average performance in the first two tasks (Figure 2.4).<sup>6</sup> Women’s level of performance in the first two tasks was very similar regardless of whether or not they were just representing their own interests or the interest of another individual in addition to their own. Therefore, when representing another individual, there was no significant increase in women’s performance.

Figure 2.4: CDF of Number of Correctly Solved Problems by Women Across Treatments



Moreover, in the other-representation condition, women who competed in Task 3 performed significantly better than those who did not, both in the piece-rate ( $p$ -value = 0.04) and tournament ( $p$ -value = 0.06), and this significance is similar to the women in the self-representation condition (Table 2.2). Although the average female performance of those who competed was higher in the other-representation treatment than the self-representation condition,

<sup>6</sup> In the piece rate, the average number of problems solved by women is 11.8 in the control condition and 12.5 when representing others’ interests. This difference is not significant using a two-sided t-test ( $p = 0.55$ ) or a one-sided t-test ( $p = 0.27$ ). In addition, in the tournament, the average number of problems solved by women is 13.2 in the control condition and 13.8 when representing others’ interests. This difference is not significant using a two-sided t-test ( $p = 0.54$ ) or a one-sided t-test ( $p = 0.27$ ).

this difference was not significant for either task ( $p$ -value = 0.22 and  $p$ -value = 0.30 for piece rate and tournament, respectively).

Table 2.2: Average Female Performance in piece rate (Task 1) and tournament (Task 2) by tournament entry decision (Task 3)

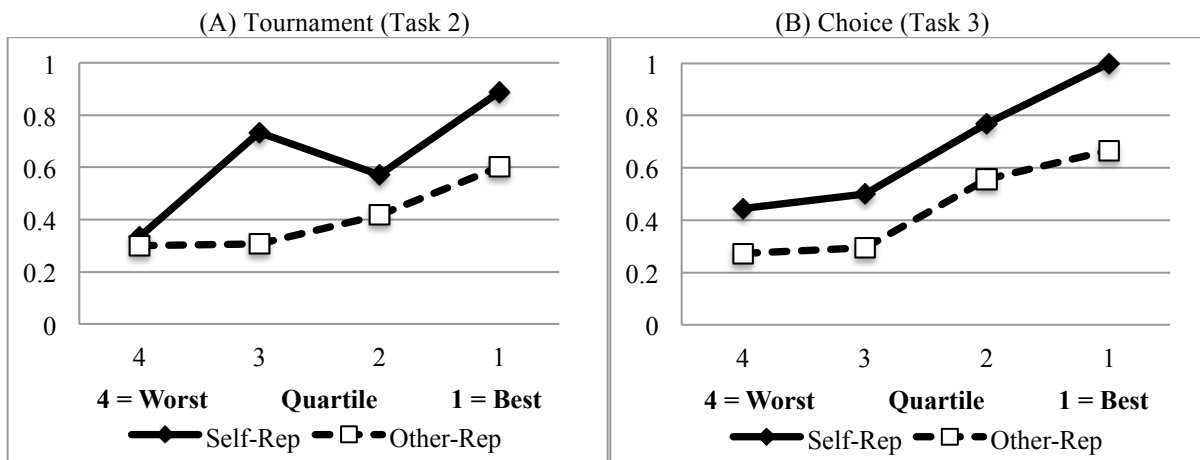
Piece Rate (Task 1)			
Performance	Compete	Don't Compete	$p$ -value
Self-Representation	12.58	10.43	0.06
Other-Representation	14.87	11.04	0.04
$p$ -value	0.22	0.57	
Tournament (Task 2)			
Performance	Compete	Don't Compete	$p$ -value
Self-Representation	14.08	11.43	0.03
Other-Representation	16.07	12.48	0.06
$p$ -value	0.30	0.34	

Note:  $p$ -values represent two-sample t-test of means.

In addition, the results from Task 3 performance were very similar to those of Task 2 across treatments. The participants who entered the tournament in the other-representation treatment did not have a significantly different increase in performance in the choice task (Task 3) relative to the former (Task 2) tournament than those who entered the tournament in the control condition ( $p$ -value = 0.48 overall,  $p$ -value = 0.61 for women and  $p$ -value = 0.21 for men). Comparing women who entered the tournament in the other-representation treatment and self-representation control condition, there were no significant increases in performance in the choice task (Task 3) relative to the former (Task 2) tournament ( $p$ -value = 0.61). In addition, women experienced the same difference in Task 3 performance across treatments between those who competed ( $p$ -value = 0.39) and those who did not ( $p$ -value = 0.57). However, in the self-representation control condition, women who chose the tournament performed significantly better than those who chose the piece-rate (one-tail t-test,  $p$ -value = 0.01), and the same is true for women in the other-representation treatment (one-tail t-test,  $p$ -value = 0.02).

Additionally, based on their performance on Task 2 and Task 3, women in the other-representative treatment entered the tournament less than those in the control condition (a one-sided Fisher’ exact test yields  $p$ -value = 0.099 and 0.039 for Tasks 2 and 3, respectively). In fact, Figure 2.5 shows that the proportion of women in the self-representation condition who selected tournament for Task 3 is higher for every performance quartile of Task 2 and Task 3 than women in the other-representation treatment.<sup>7</sup> Hence, despite similarities in performance across the two conditions, when compared to their self-representing counterparts, female ‘representatives’ shied away from entering into tournaments.

Figure 2.5: Proportion of Women Selecting Tournament for Task 3 Conditional on Task 2 performance Quartile (A) and Task 3 Performance Quartile (B)



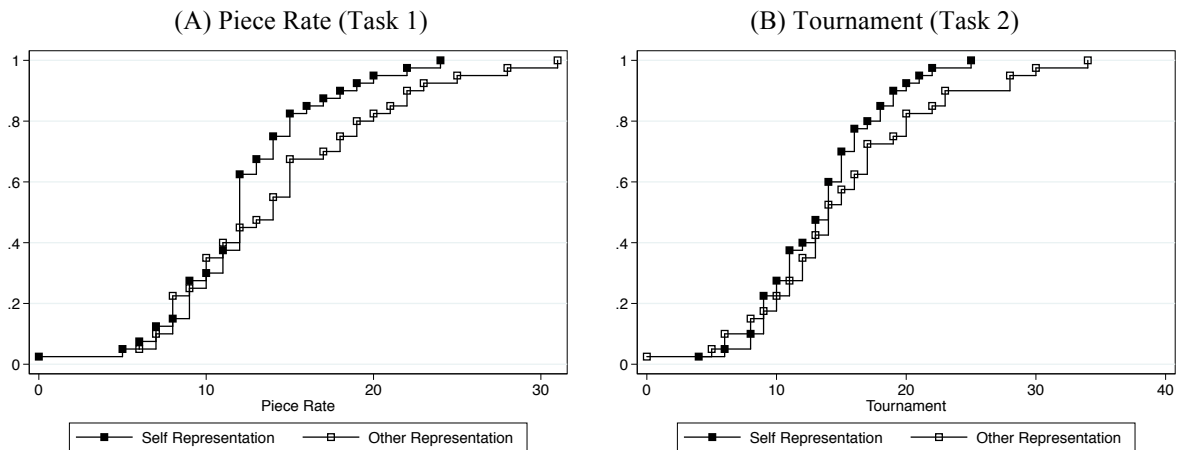
### 2.4.2. Self-Representing Men vs. Other-Representing Men

In this competitive environment, male ‘representatives’ were the ones who were “particularly energized” in terms of experiencing enhanced performance (*Hypothesis II.B*). In fact, the average number of problems solved in the Task 1 piece-rate by male ‘representatives’

<sup>7</sup> Among women whose expected earnings are lower in the tournament, those in the self-representation condition are more likely to enter a tournament than those in the other-representation condition (a one-sided Fisher’ exact test yields  $p$  = .072 and .085 for Tasks 2 and 3, respectively). Thus, from a profit-maximizing perspective, low-performing women enter the tournament too often in the self-representation condition, and high-performing women enter it too rarely in the other-representation condition.

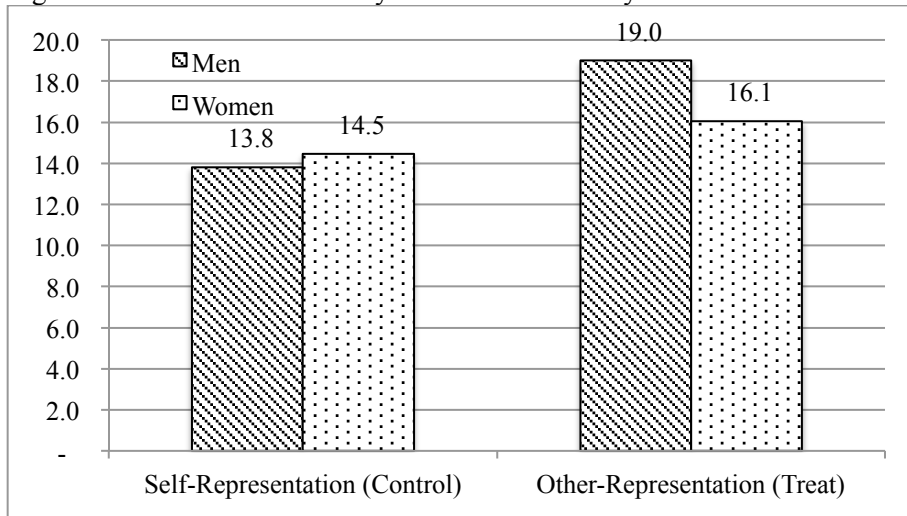
was 14.4, which was significantly higher than the 12.3 average male performance in the control condition (one-sided t-test,  $p$ -value = 0.045), and the 12.5 average female ‘representative’ performance (one-sided t-test,  $p$ -value = 0.08). In addition, as shown in Figure 2.6, in the Task 2 tournament, the average number of problems solved by male ‘representatives’ was 15.3, which was marginally higher than the 13.6 male average of correctly solved problems in the control condition (one-sided t-test,  $p$ -value = 0.099); and while higher than the 13.8 average female ‘representative’ performance, the difference was not significant (one-sided t-test,  $p$ -value = 0.16).

Figure 2.6: CDF of Number of Correctly Solved Problems By Men Across Treatments



Additionally, other-representing men were more competitive and aggressive in their performance following the choice task (Task 3). While men who chose the piece-rate did not experience a significant difference in Task 3 performance across treatments ( $p$ -value = 0.79), men who chose the tournament experienced a significantly higher Task 3 performance when representing others (Figure 2.7). In Task 3, the men who chose to compete in the other-representation treatment solved an average 19 correct answers on the task, compared to an average performance of 13.8 by the men who selected the tournament in the self-representation treatment (two-sided t-test yields  $p$ -value = 0.007).

Figure 2.7: Number of Correctly Solved Problems By Those Who Chose to Compete (Task 3)



Given this enhanced performance by male ‘representatives’, it could be expected that they also experienced higher rates of tournament entry as compared to their self-representative male counterparts (*Hypothesis 1.B*). This was not the case however. In the self-representation condition 68 percent of the men entered into the tournament in Task 3, which was not significantly different from the 58 percent of men who chose to compete in the other-representation treatment (two-tailed Fisher’s exact test,  $p$ -value = 0.49). Therefore, there was no significant increase in the share of men who entered the tournament in the other-representative treatment as compared to men in the self-representative control group.

### 2.4.3. Self-Representing Control vs. Other-Representing Treatment

Overall, the most significant difference across the self-representation control condition and the other-representation treatment was that despite having similar performance scores, female ‘representatives’ leaned out and shied away from entering into a tournament as compared to women who only represented themselves. Table 2.3, Column (1) presents the regression analysis that confirms this result: controlling for past performance, women were much less likely



to select a competitive-compensation scheme when charged with representing the interest of another individual.

Table 2.3: Probit Regression of Tournament Choice in Task 3, Marginal Effects

	(1)	(2)	(3)	(4)	(5)
	Women	Men	Self-Representatives	Representatives	All Participants
Piece-Rate	0.006 (0.025)	-0.006 (0.021)	0.012 (0.024)	-0.023 (0.028)	0.002 (0.015)
Tournament	0.061** (0.027)	0.040* (0.021)	0.026 (0.022)	0.079*** (0.030)	0.035** (0.016)
Represent	-0.365*** (0.120)	-0.170 (0.114)			-0.180 (0.117)
Female			-0.052 (0.112)	-0.264* (0.145)	-0.072 (0.109)
Represent*Female					-0.396*** (0.116)
Observations	79	76	80	75	155
PseudoR2	0.310	0.168	0.111	0.401	0.208

Notes: The table presents Probit regression results with marginal effects reported in percentage points. The dependent variable is Task-3 choice of compensation scheme (1-tournament and 0-piece rate). Piece-rate refers to Task-1 performance and Tournament refers to Task-2 performance. Represent refers to the treatment condition (1-Other-representation Treatment and 0-Self-Representation Control condition). Demographic variables such as age, race and household income level as well as the month the experiment was conducted are also controlled for. Column (1) presents marginal effects evaluated at means for a woman in the self-representation treatment. Column (2) presents marginal effects evaluated at means for a man in the self-representation treatment. Similarly, columns (3) and (4) presents marginal effects evaluated at means for a man. Column (5) presents marginal effects evaluated at means for a man in the self-representation treatment. Ranking guesses of 4, were excluded from the analysis. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

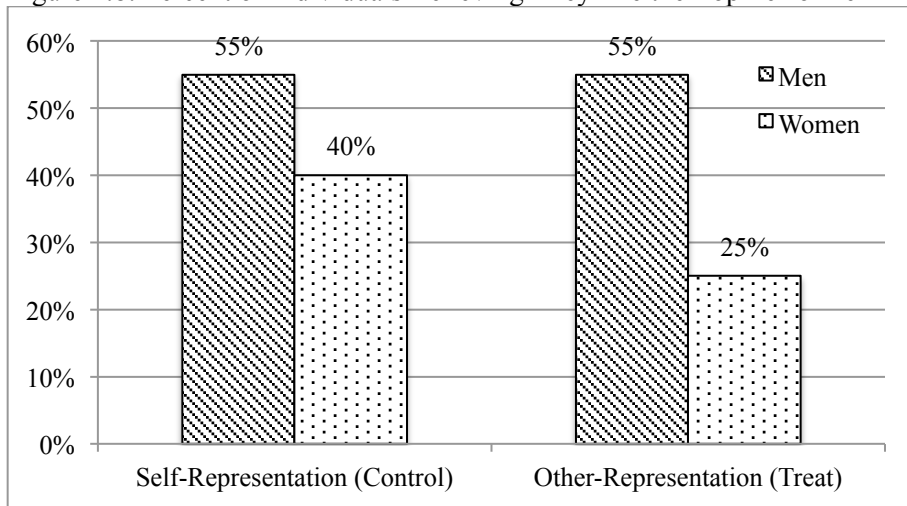
In fact, for an average female study participant, there was a significant representation effect: being a representative significantly reduced her likelihood of entering the tournament by 37 percentage points. When comparing with an average male ‘representative’ in the other-representation condition (Table 2.3, Column (4)), female ‘representatives’ were 26 percentage points less likely to enter into a tournament, though this effect is marginally significant. In contrast, women’s decisions in the self-representation condition did not differ significantly from men (Column (3)), and there was not a significant representation effect on men’s decisions as compared to the men in the control (Column (2)). All in all, controlling for past performance, female ‘representatives’ leaned out and were significantly less likely to compete in Task 3 as

compared to everyone else. The following section discusses the possible explanations for this finding.

## 2.5. Why do Female ‘Representatives’ Lean Out?

The results seem to suggest that female ‘representatives’ leaned out because they set the bar high for themselves when charged with representing another individual in this competitive environment. To evaluate participants’ beliefs on their relative tournament performance they were asked at the end of the experiment to guess how their performance in Task 2 ranked relative to the other members of their group. Participants received \$1 if their guess was correct, and in the event of a tie they were compensated for any guess that could be correct.

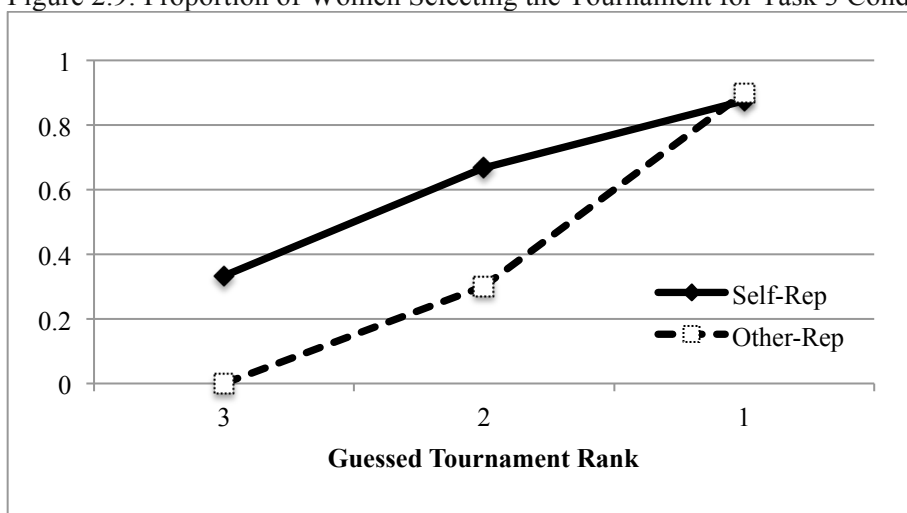
Figure 2.8: Percent of Individuals Believing They Are the Top Performer in the Task 2 Tournament



In the other-representation condition, the guesses of women and men differed significantly from one another (Fisher’s exact test of independence  $p$ -value = 0.005). In particular, men were more confident about their relative performance than women in the other-representation treatment (Figure 2.8). While 55 percent of the men in both the self- and other-representation conditions believed that they were the best in their group of four, only 25 percent

of the women in the other-representation treatment held this belief (Fisher's exact test  $p$ -value = 0.01). This was also less than the 40 percent of the women in the self-representation condition who believed that their performance ranked the highest, though this difference is not significant (Fisher's exact test  $p$ -value = 0.23).<sup>8</sup> Therefore, the lower confidence of women in the other-representation treatment cannot fully explain why, conditional on performance, they entered the tournament less frequently than women in the self-representation condition.

Figure 2.9: Proportion of Women Selecting the Tournament for Task 3 Conditional on Gussed Rank<sup>9</sup>



Nonetheless, the fact that women set a high bar for themselves does. Figure 2.9 shows the proportion of women who entered the tournament across treatments for each guessed rank.

Looking at the women who believed that they were the top performer in their group, there was absolutely no treatment gap in tournament entry (Fisher's exact test  $p$ -value = 1.00). However, these women only accounted for 25 percent of other-representing women and 40 percent of self-representing women (Fisher's exact test  $p$ -value = 0.23). In contrast, amongst the women who

<sup>8</sup> Relative to their actual rank, both men and women were overconfident in the self-representation condition. Overall, the guesses of women and men did not differ significantly from one another and a Fisher's exact test of independence of the distributions for men and women delivered  $p$ -value = 0.445. In addition, the guesses of women across these two treatments did not differ significantly from one another; a Fisher's exact test of independence of the distributions delivered  $p$ -value = 0.383.

<sup>9</sup> None of the women who ranked themselves as fourth chose to the tournament compensation scheme for Task 3.

believed that they were the second best in their group there was a significant treatment gap in tournament entry of about 36 percentage points (Fisher's exact test  $p$ -value = 0.04).<sup>10</sup>

As compared to women in the self-representation condition, it appears that women who were responsible for the interest of someone else needed to be extremely confident about their relative performance in order to select the tournament in Task 3. In fact, when female 'representatives' believed that they were the top performer, 90 percent chose the tournament, however, when they believed that they were the second best performer, that number declined to 37.5 percent. This suggests that women's other-regarding preferences may be at play, with women being concerned about their 'constituent' ending up with earnings of zero if they were not the top performer. However, when they believed that they ranked first, they proceeded with the goal of maximizing the size of the pie for themselves and their 'constituent' and therefore, chose to compete.

This is confirmed by the regression analysis in Table 2.4. When the guessed tournament ranking of one and two are controlled for, both binary variables are statistically significant, while the representation effect is nearly eliminated and is no longer significant. As also shown in Figure 5.2, the representation effect was mostly driven by differences amongst women who guessed their performance to be less than the best. When women believed that they were the top performer in both the self-representing and other-representing conditions, they are just as likely to enter into competitions. However, when women believed that they performed less than the best in their group, women in the other-representing condition were significantly less likely to join the tournament in Task 3. This suggests that when representing another individual, women set the bar high for themselves as compared to women who only represented themselves.

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<sup>10</sup> There were no significant differences across treatments among men. Seventy-three percent of men who ranked themselves as first or second in the self-representation condition competed and 70 percent competed in the other-representation condition (two-tailed t-test,  $p$ -value= 0.75).

Table 2.4: Probit Regression of Tournament Choice in Task 3, Marginal Effects

	(1)	(2)	(3)	(4)
	Women	Women	Representatives	Representatives
Piece-Rate	0.006 (0.025)	0.032 (0.027)	-0.023 (0.028)	-0.009 (0.040)
Tournament	0.061** (0.027)	-0.004 (0.014)	0.079*** (0.030)	0.064 (0.047)
Represent	-0.365*** (0.120)	-0.075 (0.075)		
Female			-0.264* (0.145)	-0.073 (0.163)
Gussed 1 as Tournament Rank		0.904*** (0.084)		0.446** (0.220)
Gussed 2 as Tournament Rank		0.681*** (0.134)		-0.157 (0.226)
Observations	79	79	75	75
PsuedoR2	0.310	0.526	0.401	0.533

Notes: The table presents Probit regression results with marginal effects reported in percentage points. The dependent variable is Task-3 choice of compensation scheme (1-tournament and 0-piece rate). Piece-rate refers to Task-1 performance and Tournament refers to Task-2 performance. Represent refers to the treatment condition (1-Other-representation Treatment and 0-Self-Representation Control condition). Gussed 1 Tournament Rank equals 1 if individual ranked their performance as the best in their group, and 0 otherwise. Gussed 2 Tournament Rank equals 1 if individual ranked their performance as the second best in their group, and 0 otherwise. Demographic variables such as age, race and household income level as well as the month the experiment was conducted are also controlled for. Column 1 presents marginal effects evaluated at means for a woman in the self-representation treatment. Column 2 presents marginal effects evaluated at means for a woman in the self-representation treatment who believed that she ranked third in Task 2 performance. Column 3 presents marginal effects evaluated at means for a man in the other-representation treatment. Column 4 presents marginal effects evaluated at means for a man in the other-representation treatment who believed that he ranked third in Task 2 performance. Ranking guesses of 4, were excluded from the analysis. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

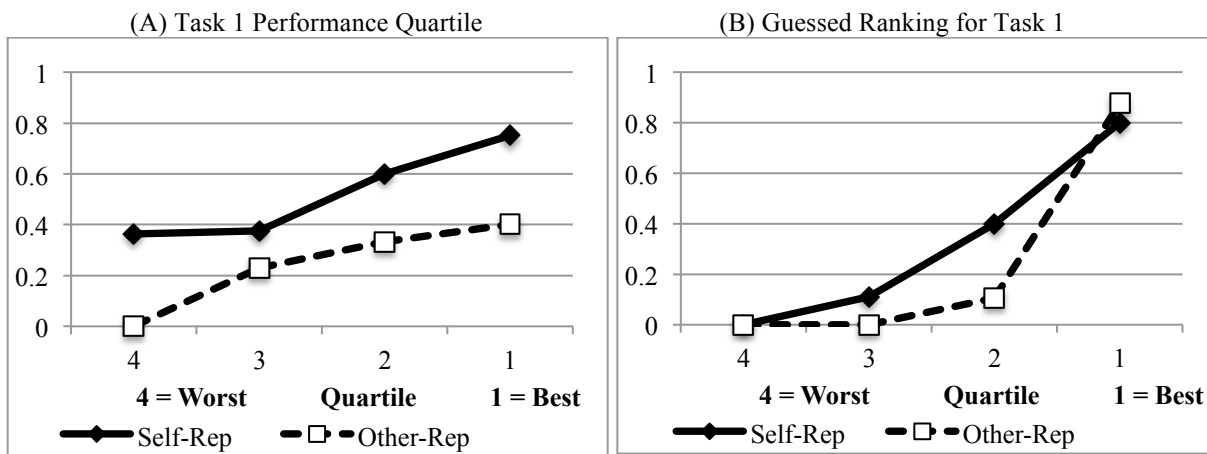
Moreover, differences in confidence levels appear to be driving the gender differences in tournament entry in the other-representing condition. When the gussed tournament rankings are controlled for (Column (4)), the representation effect is nearly eliminated and is no longer significant. Contrary to the comparison with women in the control condition, gussed ranking of two is not statistically significant. This suggests that what is driving the gender difference in tournament entry is the significantly lower share of women who believe that they are the top performer as compared to the majority of men who hold the same belief in the other-representative condition.

To rule out other factors such as risk and feedback aversion, I also examined differences in individual tournament entry decisions in Task 4. Recall that in Task 4 participants were asked to select one of two compensation schemes for their Task 1 piece-rate performance, either a piece-rate or a tournament. If they chose the piece-rate, they earned \$0.50 for each correctly solved problem in Task 1. If they selected the tournament compensation, their Task 1 performance was submitted into a competition against the Task 1 performances of the other participants in their group (independent of the other group members' choice of compensation scheme). If the individual's performance was higher than the other three players, they would win the tournament and earn \$2 for every correctly solved problem. However, if they lost the tournament, they earned nothing in Task 4.

In the self-representation control condition, 47.5 percent of women and 55 percent of men submitted their Task 1 piece-rate performance to the tournament in Task 4, yielding no significant gender differences (Fisher's exact test,  $p$ -value = 0.655). However, in the other-representation condition, significantly fewer women (22.5 percent) submitted their Task 1 piece-rate performance to the tournament as compared to men (45 percent), (Fisher's one-tail exact test,  $p$ -value = 0.029). Across the treatments, there were no significant differences in men's Task 4 decisions (Fisher's exact test,  $p$ -value = 0.503). Conversely, women in the other-representation treatment were significantly less likely to submit their Task 1 piece-rate performance to the tournament than women in the self-representation treatment (Fisher's one-tail exact test,  $p$ -value = 0.017). Thus, women in the other- and self-representation treatments differed in their compensation scheme choices even when the decision did not require them to perform in a competition.

Performance on Task 1 appears to be a significant factor in individual decisions to choose the tournament compensation scheme in Task 4. In the self-representation condition, both men and women who submitted to the tournament solved significantly more problems (13.1 for women and 13.8 for men) than those who did not submit to the tournament (10.7 for women and 10.3 for men;  $p$ -value = 0.03 for women,  $p$ -value = 0.047 for men). These differences were even more pronounced in the other-representation treatment. Women who competed, solved 16.7 problems, and women who did not, solved 11.2 problems correctly ( $p$ -value = 0.01). In addition, men who competed, solved 18.9 problems, and men who did not compete, solved 10.6 problems ( $p$ -value = 0.00).

Figure 2.10: Proportion of Women Selecting Tournament for Task 4 Conditional on Task 1 performance Quartile (A) and Gussed Task 1 Rank (B)



As shown in Figure 2.10 (Panel A), across all performance quartiles, women in the self-representation treatment were more likely than those in the other-representation treatment to submit their Task 1 piece-rate performance to a tournament in Task 4. The regression analysis in Column (1) of Table 2.5 shows that when controlling for absolute performance, women in the other-representation were significantly less likely to submit their Task 1 piece rate into a

tournament in Task 4 than women in the self-representing condition. However, when absolute performance is controlled for, there are no significant gender differences in the Task 4 choice of ‘representatives’.

Table 2.5: Probit Regression of Task 4 Choice, Marginal Effects

	(1) Women	(2) Women	(3) Representatives	(4) Representatives
Piece-Rate	0.0680*** (0.022)	0.005 (0.008)	0.0770*** (0.018)	0.000 (0.000)
Represent	-0.270** (0.119)	-0.050 (0.048)		
Female			-0.078 (0.134)	0.000 (0.000)
Guessed 1 as Piece-Rate Rank		0.763*** (0.121)		0.980*** (0.031)
Guessed 2 as Piece-rate Rank		0.187 (0.119)		0.125* (0.075)
Observations	77	77	76	76
PsuedoR2	0.246	0.382	0.428	0.757

Notes: The table presents Probit regression results with marginal effects reported in percentage points. The dependent variable is Task-4 choice of compensation scheme (1-tournament and 0-piece rate). Piece-rate refers to Task-1 performance. Represent refers to the treatment condition (1-Other-representation Treatment and 0-Self-Representation Control condition). Guessed 1 for Task1 equals 1 if individual ranked their performance as the best in their group in Task 1, and 0 otherwise. Guessed 2 for Task1 equals 1 if individual ranked their performance as the second best in their group in Task 1, and 0 otherwise. Demographic variables such as age, race and household income level as well as the month the experiment was conducted are also controlled for. Column 1 presents marginal effects evaluated at means for a woman in the self-representation treatment. Column 2 presents marginal effects evaluated at means for a woman in the self-representation treatment who believed that she ranked third in Task 1 performance. Column 3 presents marginal effects evaluated at means for a man in the other-representation treatment. Column 4 presents marginal effects evaluated at means for a man in the other-representation treatment who believed that he ranked third in Task 1 performance. Ranking guesses of 4, were excluded from the analysis. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level

In addition to performance in Task 1, individual beliefs about their relative ability appear to have played a significant role in Task 4 choices. As shown in Figure 2.10 (Panel B), when female ‘representatives’ believed that they were the top performer, they were even slightly more likely to submit their piece-rate to the tournament than the women in the self-representation condition. However, only 20 percent of female ‘representatives’ believed that they were the top performer in Task 1, as compared to 37.5 percent of women in the self-representing condition,



and this difference is marginally significant (one-tailed Fisher's exact test,  $p$ -value = 0.07). The regression analysis in Column (2) of Table 2.5 confirms this result. Including controls for guessed piece-rate rank eliminates the significance of the representation effect on women in Task 4, with individuals who guessed their rank to be one being significantly more likely to submit their Task 1 performance into a tournament. Given that when women ranked themselves as the top performer, they were just as likely to choose the tournament compensation scheme across treatments, this suggests that treatment differences in women's confidence levels explains the representation effect. This also suggests that conditioning on beliefs, factors such as risk and feedback aversion had an insignificant effect on the Task 4 decision, where there was no risk of performing in a competition.<sup>11</sup>

The only difference between the Task 3 and Task 4 decisions was that individuals faced the prospect of performing in Task 3, while in Task 4, they only decided if they wanted to submit their previous performance to a tournament. Additionally, given that women's significant representation effect in Task 4 became insignificant when beliefs about relative ability (i.e. confidence) are controlled for, the Task 4 decision to submit the piece-rate can be considered as

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<sup>11</sup> Following Niederle and Vesterlund (2007), to further confirm that risk aversion did not play significant a role, I compared women across treatments with fourteen or more correct answers in the Task-2 tournament that had a 35 percent or higher chance of winning the tournament. The decision to enter the tournament can be evaluated as a gamble of receiving, per correct answer, either \$2 with a probability of 35 percent (or more), or receiving \$0.50 for sure. For participants who had fifteen correct answers, that means a gamble of a 35 percent chance of \$30 (i.e., an expected value of \$10.50) versus a sure gain of \$7.50. Of the participants who solved fourteen problems or more, a greater percentage of women in the other-representation treatment (nine out of seventeen, 53%) did not take this or a better gamble than the women in the self-representation condition (four out of sixteen, 25%). This difference is significant with a one-sided Fisher's exact test ( $p$ -value = 0.099). Similarly, for participants who have thirteen or fewer correct answers, the chance of winning the tournament is five percent or less. Thus, entering the tournament means receiving \$2 per correct answer with a probability of five percent (or less) versus receiving \$0.50 for sure. For participants who solve twelve correct answers, this was a choice between a five percent chance of winning \$24 (i.e., an expected value of \$1.20) compared to receiving \$6 for sure. Of the participants, who solved twelve problems or less, ten out of eighteen (55.6%) of the women in the self-representation condition and four out of sixteen (25%) of the women in the other-representation condition took this or a worse gamble. This difference is significant with a two-sided Fisher's exact test ( $p$ -value = 0.09;  $p$ -value = 0.07 one-sided test). To explain these choices, women would have to be exceptionally risk-averse in the other-representation treatment and exceptionally risk seeking in the self-representation condition. However, such a significant difference in risk preferences amongst women is highly unusual, suggesting that other factors besides risk aversion may be playing a role.

an additional indication of the individual's confidence. Accordingly, when this new measure of confidence (i.e. Task 4 decision) is added to the Task 3 tournament-entry decision analysis (Table 2.6, Column (3)), it is not significant for women (i.e. confidence cannot explain the significant representation effect on women). This backs the finding that the representation effect is explained by women setting a stricter standard of competence for themselves when charged with the added responsibility of representing another individuals' interests. Moreover, it further supports that differences in confidence levels explain the gender differences in tournament entry in the other-representing condition (Table 2.6, Column (6)).

Table 2.6: Probit Regression of Tournament Choice in Task 3, Marginal Effects

	(1) Women	(2) Women	(3) Women	(4) Representatives	(5) Representatives	(6) Representatives
Piece-Rate	0.006 (0.025)	0.032 (0.027)	0.044 (0.027)	-0.023 (0.028)	-0.009 (0.040)	-0.033 (0.027)
Tournament	0.061** (0.027)	-0.004 (0.014)	0.001 (0.025)	0.0785*** (0.030)	0.064 (0.047)	0.061 (0.039)
Represent	-0.365*** (0.120)	-0.075 (0.075)	-0.155 (0.138)			
Female				-0.264* (0.145)	-0.073 (0.163)	-0.055 (0.112)
Guessed 1 as Tournament Rank		0.904*** (0.084)	0.818*** (0.155)		0.446** (0.220)	0.135 (0.210)
Guessed 2 as Tournament Rank		0.681*** (0.134)	0.690*** (0.147)		-0.157 (0.226)	-0.136 (0.183)
Submitted the Piece Rate			0.120 (0.128)			0.429* (0.224)
Observations	79	79	79	75	75	75
PseudoR2	0.310	0.526	0.542	0.401	0.533	0.560

Notes: The table presents Probit regression results with marginal effects reported in percentage points. The dependent variable is Task-3 choice of compensation scheme (1-tournament and 0-piece rate). Piece-rate refers to Task-1 performance and Tournament refers to Task-2 performance. Represent refers to the treatment condition (1-Other-representation Treatment and 0-Self-Representation Control condition). Guessed 1 Tournament Rank equals 1 if individual ranked their performance as the best in their group, and 0 otherwise. Guessed 2 Tournament Rank equals 1 if individual ranked their performance as the second best in their group, and 0 otherwise. Demographic variables such as age, race and household income level as well as the month the experiment was conducted are also controlled for. Column 1 presents marginal effects evaluated at means for a woman in the self-representation treatment. Column 2 presents marginal effects evaluated at means for a woman in the self-representation treatment who believed that she ranked third in Task 2 performance. Column 3 presents marginal effects at means for a woman who submits to the tournament in the self-representation treatment.

Table 2.6 (Continued)

Column 4 presents marginal effects evaluated at means for a man in the other-representation treatment. Column 5 presents marginal effects evaluated at means for a man in the other-representation treatment who believed that he ranked third in Task 2 performance. Column 6 presents marginal effects at means for a man who submits to the tournament in the other-representation treatment. Ranking guesses of 4, were excluded from the analysis. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

Were women ‘representatives’ correct in setting a higher bar for their performance and having lower confidence in their abilities as compared to men? As already discussed, male ‘representatives’ were particularly energized in their performance. As a result, there was in fact a gender difference in the probability of winning the Task 2 tournament in the other-representative treatment condition. Of the twenty Task-2 tournaments, men and women won the same number of tournaments in the self-representation condition, while in the other-representation treatment, men won six more tournaments than women (men won 13 and women won 7). This difference is marginally significant (one-sided Fisher’s exact test,  $p$ -value = 0.098). As in the self-representation condition (Section 4), to assess the probability of winning the tournament in the other-representation condition I randomly created four-person groups from the observed performance distributions. Conditioning only on gender, the probability of winning the tournament is 32.50 percent for a man and 17.5 percent for a woman; in a sample of forty men and forty women, this difference is marginally significant in a Fisher’s one-tail test ( $p$ -value = 0.098). Conditioning on performance, in a sample of those who scored 13 or greater, the probability of winning the tournament was 50 percent for a man and 29.2 percent for a woman (Fisher’s one-tail test,  $p$  = 0.11), in contrast to 36.4 percent for women in the self-representation condition. The probability of winning the tournament increased to 52.2 percent for a man and 35.3 percent for a woman among those who scored 14 or greater (Fisher’s one-tail test,  $p$ -value = 0.23). Whereas, for a woman in the self-representation condition who scored 14 or greater, she would have had a 50 percent chance of winning the tournament. Moreover, the probability of

winning the tournament increased to 63.2 percent for a man and 50 percent for a woman among those who scored 15 or greater; this difference is not significant (Fisher's one-tail test,  $p$ -value = 0.36). In contrast, for a woman in the self-representation condition who scored 15 or greater, she would have had a 62 percent probability of winning the tournament.

Therefore, given the higher performance of men under the other-representation condition, for every level of performance, women in the other-representation condition faced lower odds of winning the Task 2 tournament than women in the self-representation condition. Women in the other-representative condition may have expected the male 'representatives' to be more energized, which would have led them to only participate in the tournament if they believed that they were the top performer in the group. This could have been motivated by stereotype threat given the stereotypically male math task involved, possibly reducing women's overall confidence and leading them to not become as energized as men in their performance. However, given that risk and feedback aversion do not appear to have played a role, it may be more likely that women's concerns for their 'constituent' was driving their behavior.

The next section summarizes the key findings and concludes.

## **2.6. Conclusion**

For women to advance in many male dominated sectors, they need to compete with, and outperform men in these traditionally male domains while representing their gender as minorities, and the interests of their constituents. This study examined the role that being a 'representative' plays in competition behavior of men and women through a laboratory experiment. In the treatment condition, female and male 'representatives' were asked to decide whether they choose to enter into a tournament that involved performing in a male-typed task.

These ‘representatives’ were responsible for the payoff of someone else, their ‘constituents’, in addition to their own. Whereas, in the control group, individuals faced the exact same tasks and decisions, but were only responsible for their own payoffs.

With a significant majority of study participants being Harvard University students, unlike previous competition experiments, men and women in the control group exhibited very similar performance and competition behaviors. This baseline places this study in a unique position to examine how the responsibility of representing another person’s interests influenced the competitive behavior of similarly ambitious and qualified men and women, such as men and women in leadership positions. Comparing the treatment and control conditions, I found that not only were women not eager to enter into competitions when charged with representing others, but they *leaned out*: controlling for performance, female ‘representatives’ were significantly less likely to enter into tournaments than self-representing women. In addition, female ‘representatives’ did not significantly increase their performance, while male ‘representatives’ were the ones who were “particularly energized” and experienced a boost in their performance levels as compared to the self-representing men.

The leaning out of female ‘representatives’ from competition entry was largely attributed to women setting a higher bar for themselves when charged with representing another individual as compared to self-representing women. Also, compared to male ‘representatives’, female ‘representatives’ were significantly less confident in their abilities, which explained the gender gap in competition entry amongst other-representing individuals. These insights are in line with existing field research that has found highly qualified women to be setting high bars for themselves and have lower confidence in their abilities with regard to their political and entrepreneurial ambitions (Fox & Lawless, 2011; Lawless, 2012; Thebaud, 2010) – both,

traditionally male domains where women's performance in their competitions with men would also have externalities on others.

These findings contradict the prevalent hypothesis that “just as women have been found to opt out of negotiations, and yet be willing to negotiate on behalf of others, it may be that they are more eager to compete when doing so benefits others” (Niederle & Vesterlund, 2011). It turns out that women had no problem entering into competitions when only representing their own interests, but as ‘representatives’, they leaned back and shied away from competing with men. This behavior, driven by women's decreased confidence and higher expectations for themselves when representing others, contributes to the understanding of why gender gaps in many competitive stereotypically male domains continue to persist. Therefore, for women to “lean in”, meaningful interventions need to be designed and implemented to enhance their likelihood of overcoming the factors that cause them to lean out.

## 2.7. References

- Amanatullah, E. T., & Morris, M. W. (2010). Negotiating Gender Roles: Gender Differences in Assertive Negotiating Are Mediated by Women's Fear of Backlash and Attenuated When Negotiating on Behalf of Others. *J Pers Soc Psychol*, 98(2), 256-267.
- Attali, Y., Neeman, Z., & Schlosser, A. (2011). Rise to the challenge or not give a damn: Differential performance in high vs. low stakes tests *Discussion paper series // Forschungsinstitut zur Zukunft der Arbeit*.
- Balafoutas, L., & Sutter, M. (2010). Gender, competition and the efficiency of policy interventions *Working Papers in Economics and Statistics, No. 2010-12*.
- Baldiga, K. (2013). Gender differences in willingness to guess. *Management Science*, 60(2), 434-448.
- Beckmann, D., & Menkhoff, L. (2008). Will women be women?: analyzing the gender difference among financial experts *Discussion papers // School of Economics and Management of the Hanover Leibniz University, No. 391*.
- Beyer, S. (1990). Gender Differences in the Accuracy of Self-Evaluations of Performance. *J Pers Soc Psychol*, 59(5), 960-970.
- Beyer, S., & Bowden, E. M. (1997). Gender Differences in Self-Perceptions: Convergent Evidence from Three Measures of Accuracy and Bias. *Personality and Social Psychology Bulletin*, 23(2), 157-172.
- Bowles, H. R. (2012). Psychological Perspectives on Gender in Negotiation *HKS Faculty Research Working Paper Series RWP12-046*: John F. Kennedy School of Government, Harvard University.
- Bowles, H. R., Babcock, L., & McGinn, K. L. (2005). Constraints and Triggers: Situational Mechanics of Gender in Negotiation. *J Pers Soc Psychol*, 89, 951-965.

- Campbell, A. (2002). *A Mind of Her Own: The Evolutionary Psychology of Women*. Oxford, UK: Oxford University Press.
- Cason, T. N., Masters, W. A., & Sheremeta, R. M. (2010). Entry into winner-take-all and proportional-prize contests: An experimental study. *Journal of Public Economics*, 94(9), 604-611.
- Catalyst Research. (2014a). Fortune 500 CEO Positions Held By Women. 2014, from <http://www.catalyst.org/knowledge/fortune-500-ceo-positions-held-women>
- Catalyst Research. (2014b). Women On Boards. 2014, from <http://www.catalyst.org/knowledge/women-boards>
- Croson, R., & Gneezy, U. (2009). Gender Differences in Preferences. *Journal of Economic Literature*, 47(2), 448-474.
- Cross, S. E., & Madson, L. (1997). Models of the self: self-construals and gender. *Psychological Bulletin*, 122(1), 5-37.
- Daly, M., & Wilson, M. (1983). *Sex, Evolution, and Behavior* (2nd ed.). Belmont, CA: Wadsworth Publishing Company.
- Dargnies, M.-P. (2011). Social identity and competitiveness *WZB Discussion Paper, No. SP II 2011-202*.
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*: Psychology Press.
- Eckel, C. C., & Grossman, P. J. (2008). Men, women and risk aversion: Experimental evidence. *Handbook of Experimental Economics*, 1061-1073.
- Ertac, S., & Szentes, B. (2010). The effect of performance feedback on gender differences in competitiveness: experimental evidence *Working Paper, Koc University, Turkey*.



- Fischbacher, U. (2007). z-Tree: Zurich Toolbox for Ready-made Economic Experiments. *Experimental Economics*, 10(2), 171-178.
- Fox, R. L., & Lawless, J. L. (2011). Gendered Perceptions and Political Candidacies: A Central Barrier to Women's Equality in Electoral Politics. *American Journal of Political Science*, 55(1), 59-73.
- Grosse, N. D., & Riener, G. (2010). Explaining gender differences in competitiveness: Gender-task stereotypes *Jena economic research papers*, No. 2010.017.
- Healy, A., & Pate, J. (2011). Can Teams Help to Close the Gender Competition Gap? *The Economic Journal*, 121(555), 1192-1204.
- Inter-Parliamentary Union. (2016). *Women in national parliaments, as of January 1, 2016*.
- Kamas, L., & Preston, A. (2010). *Social preferences, competitiveness and compensation: Are there gender differences?*
- Kiefer, A. K., & Sekaquaptewa, D. (2007). Implicit stereotypes and women's math performance: How implicit gender-math stereotypes influence women's susceptibility to stereotype threat. *Journal of Experimental Social Psychology*, 43(5), 825-832.
- Lawless, J. L. (2012). *Becoming a Candidate: Political Ambition and the Decision to Run for Office*: Cambridge University Press.
- Lundeberg, M. A., Fox, P. W., & Punčohaf, J. (1994). Highly confident but wrong: Gender differences and similarities in confidence judgments. *Journal of Educational Psychology*, 86(1), 114.
- Niederle, M., & Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *The Quarterly Journal of Economics*(122), 1067-1101.

- Niederle, M., & Vesterlund, L. (2010). Explaining the Gender Gap in Math Test Scores: The Role of Competition. *Journal of Economic Perspectives*, 24(2), 129-144.
- Niederle, M., & Vesterlund, L. (2011). Gender and Competition. *Annual Review of Economics*, 3(1), 601-630. doi: 10.1146/annurev-economics-111809-125122
- Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Math = Male, Me = Female, Therefore Math (not equal to) Me. *J Pers Soc Psychol*, 83(1), 44-59.
- Paserman, M. D. (2007). Gender differences in performance in competitive environments: evidence from professional tennis players *IZA Discussion Papers*.
- Price, C. R. (2010). Do Women Shy Away From Competition? Do Men Compete Too Much? : A (Failed) Replication *Working Paper, University of Southern Indiana*.
- Price, C. R. (2012). Gender, Competition and Managerial Decisions. *Management Science*, 58(1), 114-122.
- Price, J. (2008). Gender Differences in the Response to Competition. *Industrial and Labor Relations Review*, 61(3), 320-333.
- Pruitt, D. G., Carnevale, P. J. D., Forcey, B., & Van Slyck, M. (1986). Gender Effects in Negotiation: Constituent Surveillance and Contentious Behavior. *Journal of Experimental Social Psychology*, 22(264-275).
- Pulford, B. D., & Colman, A. M. (1997). Overconfidence: Feedback and item difficulty effects. *Personality and Individual Differences*, 23, 125-133.
- Roberts, T.-A., & Nolen-Hoeksema, S. (1989). Sex differences in reactions to evaluative feedback. *Sex Roles*, 21(11/12).

- Ruble, D. N., Martin, C. L., & Berenbaum, S. A. (2006). Gender Development. In W. Damon & R. M. Lerner (Eds.), *Handbook of Child Psychology* (6th ed., Vol. 3, pp. 858–932). New York: Wiley.
- Rudman, L. A. (1998). Self-Promotion as a Risk Factor for Women: The Costs and Benefits of Counterstereotypical Impression Management. *J Pers Soc Psychol*, 74(3), 629-645.
- Rudman, L. A., & Glick, P. (1999). Feminized Management and Backlash Toward Agentic Women: Hidden Costs to Women of a Kinder, Gentler Image of Middle Managers. *J Pers Soc Psychol*, 77(5), 1004-1010.
- Rutgers University. (2016). History of Women in the U.S. Congress. Retrieved 2016, from <http://www.cawp.rutgers.edu/history-women-us-congress>
- Sandberg, S. (2013). *Lean In: Women, Work, and the Will to Lead*. New York: Alfred A. Knopf.
- Shurchkov, O. (2012). Under Pressure: Gender Differences in Output Quality and Quantity under Competition and Time Constraints. *Journal of the European Economic Association*, 10(5), 1189-1213.
- Soll, J. B., & Klayman, J. (2004). Overconfidence in interval estimates. *Journal of Experimental Psychology: Learning Memory, and Cognition*, 30(2), 299-314.
- Spencer, S. J., & Steele, C. M. (1999). Stereotype Threat and Women's Math Performance. *Journal of Experimental Social Psychology*, 35, 4-28.
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *J Pers Soc Psychol*, 69(5), 797-811.
- Sutter, M., & Rützler, D. (2010). Gender differences in competition emerge early in life *Working Papers in Economics and Statistics*, No. 2010-14.

Thebaud, S. (2010). Gender and Entrepreneurship as a Career Choice: Do Self-assessments of Ability Matter? *Social Psychology Quarterly*, 73(3), 288–304.

Wozniak, D., Harbaugh, W. T., & Mayr, U. (2009). Choices about competition: Differences by gender and hormonal fluctuations, and the role of relative performance feedback  
*Available at SSRN 1564895*.

## **Chapter 3:**

### **Descriptive Norms and Gender Diversity:**

#### **Reactance from Men<sup>12</sup>**

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<sup>12</sup> Co-authored work by: Maliheh Paryavi, Iris Bohnet and Alexandra van Geen

### 3.1. Introduction

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

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

In contrast to the norm nudges applied in other domains, most discussions concerning gender diversity focus peoples' attention on the *lack* of women in traditionally male-dominated (and to a lesser extent, lack of men in traditionally female-dominated) fields. For example, the

Economist (2014) reports, “Almost everywhere women are in a minority in government cabinets.” The UN Women’s (2015) website also states, “Women are underrepresented as voters, as well as in leading positions, whether in elected office, the civil service, the private sector or academia.” In the US, low percentages of women senators (20%), Fortune 500 CEOs (4.8%), women serving on boards (16.9%) and tenured faculty (21.2%) are often cited examples (Catalyst Research, 2014a, 2014b; Curtis & Thornton, 2013-2014; Rutgers University, 2016). The fact that only 21.8 percent of members of parliament across the world are women remains the focus of discussion regarding underrepresentation of women in political leadership (Inter-Parliamentary Union, 2014).

Similarly, while not discussed quite as much as the “missing women” in leadership positions, the “missing men” in elementary school education (with, for example, only 10.2 percent male elementary school teachers in the US) has garnered attention in academia and the popular press (Antecol, Eren, & Ozbeklik, 2012; Dee, 2007; Goldring, Gray, & Bitterman, 2013). According to the available research on social norms, the focus on the under-representation of a particular group could potentially be turning descriptive statistics into prescriptive norms that suggest the fraction of the underrepresented gender in these settings to be kept small. This paper aims to determine if this is in fact the case and whether different information, focusing on majority behavior, would have similar prescriptive effects as in other domains. For example, in contrast to focusing on the absence of women in leadership or men in teaching, one could focus on the majority of companies with gender diverse boards or the majority of schools with teachers from diverse backgrounds.

What impacts descriptive norms have on the gender composition of a group is truly an empirical question given that the gender domain is quite different from the other areas in which

descriptive norms have been studied thus far. A handful of earlier studies suggest that descriptive norms are not effective in nudging behavior in every domain and may even lead to increases in undesirable behaviors. For example, peer social norm information has had negative effects on the academic performance of the lowest ability students (Carrell, Sacerdote, & West, 2011) and savings of certain employees (Beshears, Choi, Laibson, Madrian, & Milkman, 2011). In addition, Costa and Kahn (2013) find that unlike Democrats, when Republicans were made aware of their relatively low electricity usage, they turned up their thermostat and switched off the light less often.<sup>13</sup> The authors propose that this “boomerang effect” may be the result of Republicans not believing that reducing energy saves the planet and thus, not having internalized the norm that considers the reduction of energy usage to be a good thing. This suggests that for a descriptive norm to have prescriptive effects, the recipients may need to have internalized the norm to some extent.

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

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<sup>13</sup> See also Perkins, Haines, & Rice, 2005; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007; Wechsler et al., 2003; and Werch et al., 2000.



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

This paper attempts to address this by running a series of laboratory experiments to study how descriptive norms affect the gender diversity of hiring decisions. Specifically, we had ‘employers’ decide how many male and female ‘employees’ they want to hire for male- and female-typed tasks and examined whether employers were more likely to hire more of one gender when informed that others have done so as well. In our experiments, descriptive norms did not have prescriptive effects on gender diversity. In fact, descriptive norms did not affect

female employers' hiring decisions at all and led to male reactance when the descriptive norm information favored female candidates. When informed that others had hired more women, male employers hired fewer female candidates than when no norm information was given. Reactance was particularly pronounced when the way the norm was framed emphasized women's gains.

The paper is organized as follows: Section 3.2 discusses the conceptual frameworks, Section 3.3 introduces the experimental design, Section 3.4 presents our results, and Section 3.5 concludes and discusses the implications of this research.

### **3.2. Conceptual Framework: Norm Conformity and Norm Reactance**

The existing literature on descriptive norm nudges hinges on the theory that individual decision makers like to conform to social norms. *Norm conformity* is supported by numerous studies where descriptive norms have led to norm-consistent behavior (Cialdini et al., 2006). However, gender-based descriptive norm nudges may not necessarily have prescriptive effects, and instead, result in norm reactance. Some of the possible reactance channels apply to all employers, independent of their own gender. Others are particularly relevant for one sex only and may interact with the sex of the employee. Our experiments allowed us to distinguish among norm conformity and the two possible reactance channels.

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

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

*Reactance from the disfavored gender:* In many of the domains studied so far (e.g., voting or energy conservation), norm-conformity may be individually costly but makes everyone else better off. Conforming to the norm means contributing to a public good. In contrast, the gender domain raises distributive concerns and can lead to intergroup threat: an increase in gender diversity requires the overrepresented gender to become less represented, reducing the group's relative numbers and potentially, its status (Tajfel, 1982; Tajfel & Turner, 1986). If the norm information threatens the representation and status of the members of specific groups, this can motivate them to take actions that improve their group's social identity (Fiske, Cuddy, Glick, & Xu, 2002; Jetten et al., 2004; Roccas & Schwartz, 1993; Schmitt et al., 2007; Tajfel, 1982). Therefore, this zero-sum environment may lead to resistance, instead of conformity, by the group being disfavored by the norm information.

*Reactance from men:* High-status group members may be more likely than the low-status group to view increases in intergroup equality negatively, namely, as a loss to their higher status (Eibach & Keegan, 2006; Sidanius & Pratto, 1999). As a result, when descriptive norms provide unfavorable information about their gender group's status, norm-reactance might be particularly

pronounced amongst the traditionally higher-status group: men. Indeed, while evidence on the strength of typical group identification by men and women is mixed (Rudman & Goodwin, 2004; Schmader, 2002; Spoor & Schmitt, 2011), studies suggest that men respond more strongly to intergroup threat than women (Hong & Bohnet, 2007; Van Vugt, De Cremer, & Janssen, 2007). This could be due to increased male gender identification in the face of intergroup comparisons. For example, Spoor and Schmitt (2011) found that when made aware of women's progress over the past few decades, young men reported high levels of anxiety and a strong sense of solidarity and protectiveness towards their own gender, whereas women reported weaker group identification in response to intergroup comparisons.

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

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

### **3.3. Experimental Design**

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

#### **3.3.1. Stage 1: Creating Gender Norms**

In the first stage of our experiment, we asked a set of employers to decide which employees they want to hire for both a stereotypical male-typed task (a math task) and a stereotypical female-typed task (a word task).<sup>14</sup> The set of candidates that were described to the employers were preselected from an existing pool of study participants that had previously participated in three rounds of the tasks (Bohnet, van Geen, & Bazerman, 2016).<sup>15</sup> These candidates were preselected so that their characteristics and performance distribution were as comparable as possible across genders.

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<sup>14</sup> See Bohnet et al (2016) for a discussion on the stereotypical perception of both tasks.

<sup>15</sup> The incentivized math task they performed consisted of adding as many rows of five two-digit numbers, and the incentivized word task involved finding words in a matrix during a given time period. The participants performed each task at least three times.

Our employers were presented with 10 male and 10 female candidates to choose from for both, the math and the verbal task. To prevent potential framing effects, the candidates were (truthfully) referred to as “pervious participants” to the employers and their individual information was presented to the employers on randomly ordered index cards that displayed (i) participant number, (ii) gender, and (iii) performance scores for two rounds on the task under consideration. In order to reduce the salience of gender, information on participant race, nationality, and whether they were a Boston area resident was also included.<sup>16</sup> The stack of twenty candidates for each task had similar mean and variance in their scores although this information was not provided to the subjects. Table 3.1 presents an overview of candidate characteristics.

Table 3.1: Descriptive Statistics of Candidates

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

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

<sup>16</sup> We made sure that the profiles of the two fifth best candidates were identical in all these additional characteristics so that ‘employers’ could base their decision between those two candidates only on the performance scores and gender.

candidates.<sup>17</sup> The profit-maximizing employer should use the performance information from the first two rounds (score 1 and score 2) and the other candidate information to select those five candidates that in expectation would have the highest round 3 performance score.

In each set of candidates, the top six scoring individuals (in each task) were three women and three men.<sup>18</sup> The top four scoring individuals were two men and two women, where each gender pair had the exact same scores. The two next-best candidates (one male and one female) in each group did not have the same exact scores, but had the same *average* scores in the two rounds: (13, 15) and (14, 14) in the math task, and (11, 15) and (13, 13) in the verbal task (i.e. one individual had a low variance, identical score set, and one individual had a high variance score set).<sup>19</sup> Since the employer had to choose five employees, and the first four best employees were “no-brainers”, the unbiased, profit-maximizing employer’s fifth decision was between those two remaining individuals, i.e. the fifth-place contenders. A risk averse employer would prefer the low variance fifth-choice contender. Accordingly, we varied whether that candidate was male or female.

To test for the impact of different norms in Stage 2 but still report Stage 1 outcomes truthfully, we aimed to enhance variation in the choices the Stage 1 employers made. Our goal was to observe at least one session where most Stage 1 employers chose a group of majority female employees and at least one session where most Stage 1 employers chose a group of majority male employees. We sought to do this without fundamentally changing the experimental design so that the identical design could be replicated in Stage 2. Thus, we varied

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<sup>17</sup> For example, in the math task, if the five chosen employees added up 50 rows of numbers correctly in the third round, they would score a total of 50 points and the employer would receive \$10 (50 x \$0.20).

<sup>18</sup> Besides gender and performance scores all attributes of the top six performing candidates were identical.

<sup>19</sup> The scores were not presented in any particular sequence and this was mentioned to the study participants. The scores presented are two of the three performance round scores, not the first two of three performance round scores. Therefore, the high variance profiles would not necessarily suggest learning.

the order in which employers were confronted with the two tasks, with the math task presented either before or after the verbal task in an experimental session.<sup>20</sup>

### *Stage 1 Experimental Procedures*

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

### *Identifying Gender Norms*

Table 3.2 displays the outcome of Stage 1-employers' hiring decisions. In session 1, when the math task was presented first, we observed slightly stereotype-contradicting hiring behavior with 62% of employers in the math task and 46% of employers in the verbal task selecting majority female employee groups. In contrast, when the verbal task was presented to

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<sup>20</sup> We had no view on how order would affect behavior, other than possibly creating variation in at least some of the sessions.



the employers first (Session 2), we observed stereotypical hiring behavior with only 29% of individuals choosing more female employees for the math task and 71% choosing more women for the verbal task. Sessions 3 and 4 did not yield any variation in hiring behavior, with most employers choosing majority female groups for both tasks.

Table 3.2: Stage 1 Hiring Norms, Percentage of Employers Hiring Majority Female Groups

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

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

### 3.3.2. Stage 2: Testing the Impact of Norm Information on Hiring

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

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

Hence, this part of the study consisted of two control conditions and four treatment conditions, summarized in Table 3.3 below.

Table 3.3: Descriptive Norm Information Used in Stage 2

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

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

### *Stage 2 Experimental Procedures*

The experimental sessions for Stage 2 included 192 participants (i.e. employers) and were conducted in twenty-five sessions using the student subject pool at the Harvard Decision Science Laboratory in Cambridge, MA. The two control and four experimental treatment conditions consisted of equal proportions of female (18 out of 32 participants) and male participants (14 out

of 32 participants), with a total of 108 female subjects and 84 male subjects. As in Stage 1, all Stage 2 participants remained anonymous throughout the study and were only identified with code numbers, the experiment was programmed using Z-tree (Fischbacher, 2007), and the instructions were read out loud and can be found in Appendix B.2. Stage 2 results are discussed in the next section.

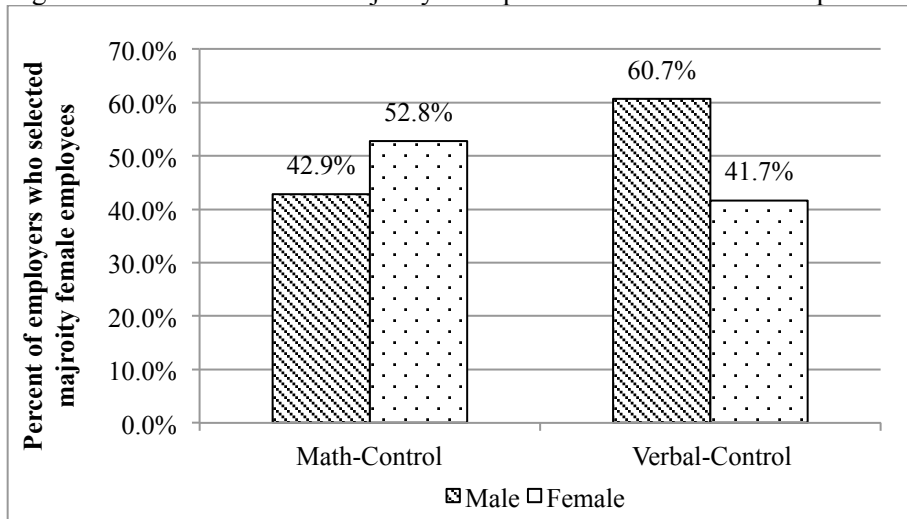
### **3.4. Results: The Effects of Descriptive Norm Information**

In Stage 2 we studied the impact of descriptive norms on gender diversity in hiring decisions. First, we present our control treatment results with Figure 3.1 depicting employers preferences where no information on previous employer choices was provided (Control Conditions 1 and 2, N=64). The likelihood that male employers chose majority female groups of employees (i.e. more than two female employees in the group of five) was 42.9% in the math task and 60.7% in the verbal task. While directionally suggestive of stereotypical hiring, these differences are not significant compared to an equal split (math task:  $z = -0.76$ ,  $p = 0.22$ ; verbal task:  $z = 1.14$ ,  $p = 0.13$ ). Among female employers, 52.8% chose majority female employees in the math task and 41.7% chose majority female employees in the verbal task; also not significant compared to an equal split (math task:  $z = 0.33$ ,  $p = 0.74$ ; verbal task:  $z = -1.00$ ,  $p = 0.16$ ). Therefore, neither male nor female employers showed significant stereotypical hiring tendencies and we found no evidence of gender specific discrimination in the control treatments.<sup>21</sup>

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<sup>21</sup> Men were no more likely to stereotypically choose majority female ‘employees’ in the verbal task than women (t-test yields  $p = 0.13$ ), and there was an insignificant gender difference in ‘employee’ selection for the math task ( $p = 0.44$ ).

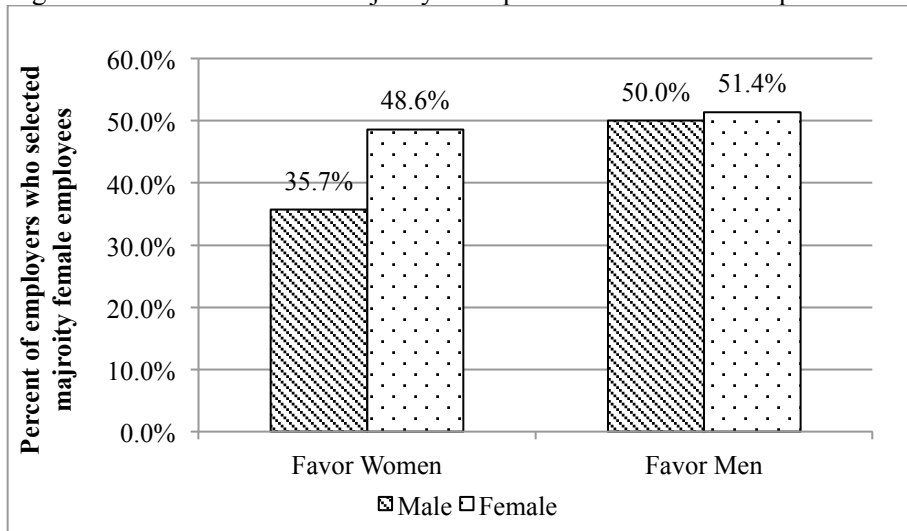
Figure 3.1: Percent Female Majority Groups Selected without Descriptive Norm Information



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

Figure 3.2 presents our results. When Stage 2-employers learned that previous employers in Stage 1 had chosen mostly women, 35.7 percent of second-stage male employers chose female majority groups, which is significantly below an equal split ( $z = -2.14, p = 0.01$ ). Specifically, compared to an equal split, when previous employers had favored women, the likelihood that men chose female majority groups was 39 percent in the math task ( $z = -1.13, p = 0.13$ ) and 32 percent in the verbal task ( $z = -1.89, p < 0.05$ ).

Figure 3.2: Percent Female Majority Groups Selected with Descriptive Norm Information



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

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

Table 3.4 presents a regression analysis where we compare employers' choices in situations where the norm information favored women or men with our control treatments where no norm information was provided. Column 1 shows that Stage 2 male employers were

significantly less likely to choose female majority groups when the information favored women as compared to treatments where no information on norms was provided. In fact, the average male employer was 20 percentage points more likely to select a group of mostly women when no norm information was provided than when the norm favored women ( $p < 0.05$ ). Column 3 also shows that this effect is significant: male employers confronted with norms that favor women were the only individuals reacting to this information by choosing significantly fewer female majority groups than everyone else.

Table 3.4: The Effect of Descriptive Norm Information on the Percent of Female Majority Groups Selected, Marginal Effects at Mean

	(1)	(2)	(3)
	Male Subjects	Female Subjects	Male & Female Subjects
FemaleFavoringNorm	-0.197** (0.093)	0.009 (0.087)	-0.073 (0.064)
MaleFavoringNorm	-0.049 (0.100)	0.037 (0.088)	0.007 (0.065)
Math	-0.034 (0.078)	0.077 (0.069)	0.027 (0.051)
Male			-0.026 (0.052)
FemaleFavoringNorm*Male			-0.140* (0.083)
MaleFavoringNorm*Male			-0.036 (0.086)
Control Variables Included	YES	YES	YES
Observations	168	216	384
Pseudo-R2	0.0424	0.0295	0.0190

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

Therefore, our results do not support reactance based on concerns for equality nor reactance by the disfavored group, as women did not show any reactance to earlier employers

favoring men. Rather, our results suggest that only the high-status group, men, showed reactance when confronted with earlier employers favoring the low-status group: women.

Further analysis of our results provides insights into the mechanisms behind this male reactance. In our treatment conditions, the information on previous employers' choices was provided to study participants with different gender frames. The frame either focused on men being in the gain position as compared to women (i.e. the male frame) or women being in the gain position as compared to men (i.e. the female frame). While the gender frame of the norm information seems to have no effect on female employers, the results show that male employers were sensitive to the frame in which the norm information was expressed: men showed reactance to norm information that focused on women being in a position of gain as compared to men.<sup>22</sup>

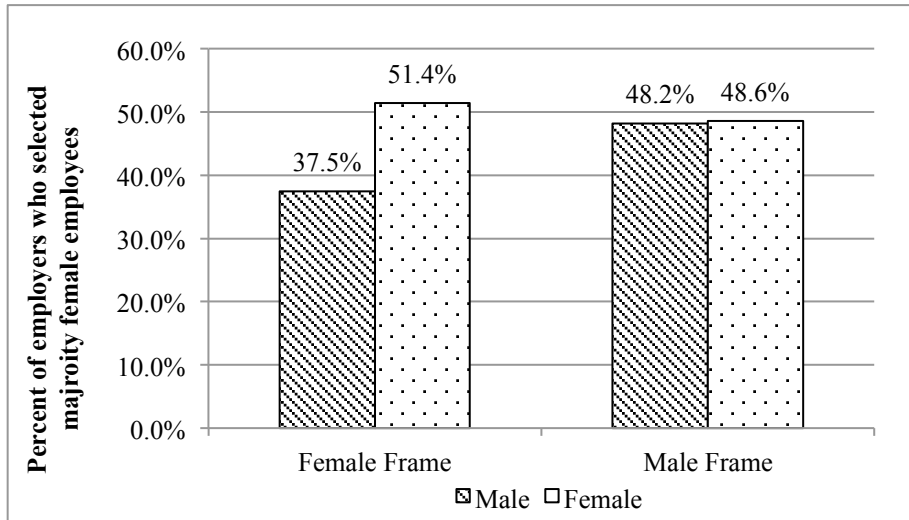
Figure 3.3 presents this result. When the norm information was presented with a female frame, 37.5 percent of male employers chose majority women employees, which is significantly below an equal split ( $z = -1.87, p < 0.05$ ). More specifically, when norm information was presented in a female frame, men chose majority women employees with 39.3 percent likelihood in the math task ( $z = -1.13, p = 0.13$ ) and 35.7 percent in the verbal task ( $z = -1.51, p < 0.10$ ). When the male frame was used, this effect disappeared and male employers were equally likely to choose men and women in the math and the verbal tasks.

Figure 3.3: Percent of Majority Female Employee Groups Selected with Framing

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<sup>22</sup> When female frame is used, the likelihood that women select majority women employees was 52.8 percent in the math task and 50 percent in the verbal task. When the male frame is used, the likelihood that women select majority women employees was 52.8 percent in the math task and 44.4 percent in the verbal task. None of these likelihoods significantly differ from an equal split.

Figure 3.3 (Continued)



Moreover, when descriptive norms favored women and were described using a female frame, male employers exhibited particularly pronounced reactance (Figure 3.4). When a female frame was used and the norm favored women (e.g. “71% chose more women than men”), only 21 percent of the male employers chose female majority groups, which is significantly below an equal split ( $z = -3.0237, p < 0.01$ ). This also significantly differs from the same descriptive norm information provided with a male frame (namely, that “29% chose more men than women”), where 50 percent of the male employers chose majority female employees.

Figure 3.4: Percent Majority Female Groups Selected with Descriptive Norm Information and Framing

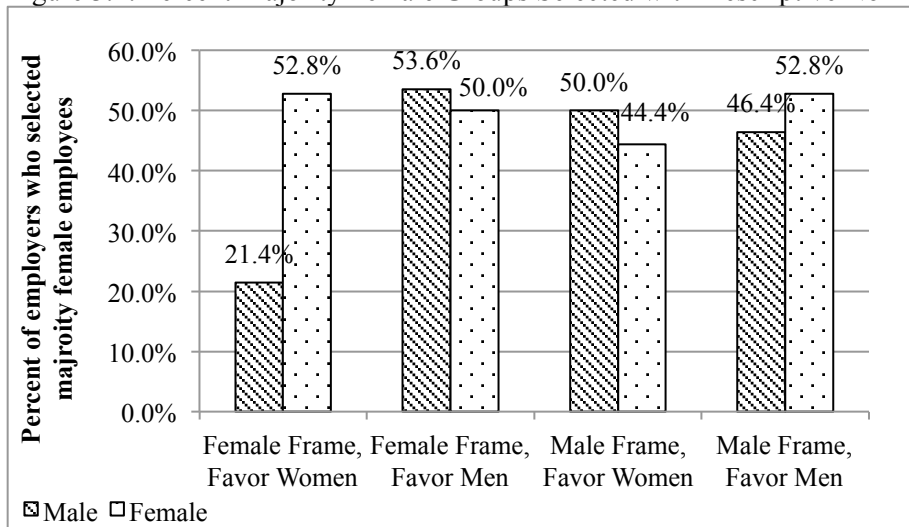




Table 3.5 presents a regression analysis that confirms these results, with the control conditions as our baseline comparison. Column (1) shows that male employers were 33 percentage points less likely to choose female majority groups when exposed to a female favoring norm with a female frame as compared to treatments with no norm and frame. This effect is highly significant. In addition, in column (3) we observe the average male employer is 29 percentage points less likely to hire majority female groups than the average female employer when provided with norm information that favors women and places women in the position of gain by using a female frame ( $p < 0.01$ ).

Table 3.5: The Effect of Descriptive Norm Information & Framing on the Percent of Majority Female Groups Selected, Marginal Effects at Mean

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

Table 3.5 (Continued)

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

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

### **3.5. Discussion and Conclusions**

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

However, when describing what others have done, male employers tended to “correct” for others having chosen more women than men: they chose more male employees when others had chosen more women in both, the male-typed math and the female-typed verbal task. This male reactance was more pronounced when the gender diversity norm was framed with women being in the gain position. Conversely, male employers were not affected when others had chosen more men and did not “correct” for the prior behavior of others who had favored men.

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

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

On the other hand, reactance against women has been implied in many situations when women appear to be favored. For example, Dezsó, Ross, and Uribe (2016) found that once a company hires a woman to a top-tier job, the probability of a second woman to land a top position at the same firm drops by about 50 percent – though, companies with female CEO's did slightly better in this regard. Gender quotas seem to also yield a backlash response. In a field experiment, in India Beaman et al. (2009) found that male villagers increase their relative

preference for male leaders (compared to female leaders) whenever their village council has experienced a gender quota. Moreover, Leibbrandt, Wang, and Foo (2015) found that subjects who have been advantaged by quota receive backlash from coworkers.

At the same time, our experiment differs in important dimensions from these interventions in the field. First, we use a norm nudge that does not impose any policy mandates such as a quota system. In addition, we did not start out with employers having very gender biased preferences in the control conditions. Thus, there was little to ‘correct’ to start with. In contrast, the fractions of female political and business leaders and male elementary school teachers rarely surpass 20 percent. By studying majority female (and majority male) groups, we might have created more male reactance than what we would have observed if the fraction of women was increased from, say about 10 to about 25 percent, as was done for corporate boards in the UK.

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

### 3.6. References

- Adler, A. ([1910] 1956). Inferiority Feeling and Masculine Protest. In H. L. Ansbacher & R. R. Ansbacher (Eds.), *The Individual Psychology of Alfred Adler: A Systematic Presentation in Selections from His Writings* (pp. 45-52). New York: Basic Books.
- Ahern, K. R., & Dittmar, A. K. (2012). The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation. *The Quarterly Journal of Economics*, 127(1), 137-197.
- Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics*, 95(9), 1082-1095.
- Allcott, H., & Rogers, T. (2012). The Short-run and Long-run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation. Working Paper. NBER.
- Antecol, H., Eren, O., & Ozbeklik, S. (2012). The effect of teacher gender on student achievement in primary school: Evidence from a randomized experiment. Discussion Paper Series. Institute for the Study of Labor (IZA).
- Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R., & Topalova, P. (2009). Powerful Women: Does Exposure Reduce Bias? *The Quarterly Journal of Economics*, 142(4), 1497-1540.
- Beshears, J., Choi, J. J., Laibson, D., Madrian, B. C., & Milkman, K. L. (2011). The Effect of Providing Peer Information on Retirement Savings Decisions. Working Paper. NBER.
- Bohnet, I. (2016). *What Works: Gender Equality by Design*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.
- Bohnet, I., van Geen, A., & Bazerman, M. (2016). When Performance Trumps Gender Bias: Joint Versus Separate Evaluation. *Management Science*, 62(5), 1225–1234.
- Carrell, S. E., Sacerdote, B. I., & West, J. E. (2011). From Natural Variation to Optimal Policy? The Lucas Critique Meets Peer Effects. Working Paper. NBER.
- Catalyst Research. (2014a). Fortune 500 CEO Positions Held By Women. 2014, from <http://www.catalyst.org/knowledge/fortune-500-ceo-positions-held-women>

- Catalyst Research. (2014b). Women On Boards. 2014, from <http://www.catalyst.org/knowledge/women-boards>
- Chattopadhyay, R., & Duflo, E. (2004). Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica*, 72(5), 1409-1443.
- Cialdini, R. B. (2003). Crafting Normative Messages to Protect the Environment. *Current Directions in Psychological Science*, 12(4), 105-109.
- Cialdini, R. B., Demaine, L. J., Sagarin, B. J., Barrett, D. W., Rhoads, K., & Winter, P. L. (2006). Managing social norms for persuasive impact. *Social Influence*, 1(1), 3-15.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places. *J Pers Soc Psychol*, 58(6), 1015–1026.
- Coffman, L. C., Featherstone, C. R., & Kessle, J. B. (2014). Can Subtle Provision of Social Information Affect What Job You Choose and Keep? Working Paper.
- Costa, D. L., & Kahn, M. E. (2013). Energy Conservation “Nudges” and Environmentalist Ideology: Evidence from a Randomized Residential Electricity Field Experiment. *Journal of the European Economic Association*, 11(3), 680–702.
- Croson, R., & Shang, J. (2008). The impact of downward social information on contribution decisions. *Experimental Economics*, 11(3), 221-233. doi: 10.1007/s10683-007-9191-z
- Curtis, J. W., & Thornton, S. (2013-2014). *Losing Focus: The Annual Report on the Economic Status of the Profession Annual Report: American Association of University Professors*.
- Davies, L. (2011). *Women on Boards Davies Report*. UK: Department for Business, Innovation & Skills.
- Davies, L. (2014). *Women on Boards Davies Review Annual Report*. UK: Department for Business, Innovation & Skills.
- Dee, T. (2007). Teachers and the gender gaps in student achievement. *Journal of Human Resources*, 42(3), 528-554.

- Dezso, C. L., Ross, D. G., & Uribe, J. (2016). Is there an implicit quota on women in top management? A large-sample statistical analysis. *Strategic Management Journal*, 37(1), 98-115.
- Eibach, R. P., & Keegan, T. (2006). Free at last? Social dominance, loss aversion, and white and black Americans' differing assessments of racial progress. *J Pers Soc Psychol*, 90(3), 453-467.
- Fischbacher, U. (2007). z-Tree: Zurich Toolbox for Ready-made Economic Experiments. *Experimental Economics*, 10(2), 171-178.
- Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A Model of (Often Mixed) Stereotype Content: Competence and Warmth Respectively Follow From Perceived Status and Competition. *J Pers Soc Psychol*, 82(6), 878–902.
- Frey, B. S., & Meier, S. (2004). Social Comparisons and Pro-Social Behavior: Testing "Conditional Cooperation" in a Field Experiment. *The American Economic Review*, 94(5), 1717-1722.
- Gerber, A. S., & Rogers, T. (2009). Descriptive Social Norms and Motivation to Vote: Everybody's Voting and so Should You. *The Journal of Politics*, 71(01), 178.
- Goldring, R., Gray, L., & Bitterman, A. (2013). Characteristics of Public and Private Elementary and Secondary School Teachers in the United States: Results From the 2011–12 Schools and Staffing Survey (NCES 2013-314). Washington, DC: National Center for Education Statistics.
- Goldstein, Noah J., Cialdini, Robert B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research*, 35(3), 472-482.
- Holt, C. A., & Laury, S. K. (2002). Risk Aversion and Incentive Effects. *American Economic Review*, 92(5), 1644-1655.
- Hong, K., & Bohnet, I. (2007). Status and distrust: The relevance of inequality and betrayal aversion. *Journal of Economic Psychology*, 28(2), 197-213.
- Inter-Parliamentary Union. (2014). Women in Politics.

- Jetten, J., Spears, R., & Postmes, T. (2004). Intergroup Distinctiveness and Differentiation: A Meta-Analytic Integration. *J Pers Soc Psychol*, 86(6), 862-879.
- Koenig, M. A., Ahmed, S., Hossain, M. B., & Mozumder, A. B. M. K. A. (2003). Women's Status and Domestic Violence in Rural Bangladesh: Individual- and Community-level Effects. *Demography*, 40(2), 269–288.
- Krook, M. L. (2009). *Quotas for Women in Politics: Gender and Candidate Selection Reform Worldwide*. New York: Oxford University Press.
- Leibbrandt, A., Wang, L. C., & Foo, C. (2015). Gender Quotas, Competitions, and Peer Review: Experimental Evidence on the Backlash Against Women. CESIFO Working Paper Series. CESifo Group Munich.
- Luke, N., & Munshi, K. (2011). Women as agents of change: Female income and mobility in India. *Journal of Development Economics*, 94(1), 1-17.
- Martin, R., & Randal, J. (2008). How is donation behaviour affected by the donations of others? *Journal of Economic Behavior & Organization*, 67, 228–238.
- Perkins, H. W., Haines, M. P., & Rice, R. (2005). Misperceiving the College Drinking Norm and Related Problems: A Nationwide Study of Exposure to Prevention Information, Perceived Norms and Student Alcohol Misuse. *Journal of Studies on Alcohol*, 66(4).
- Roccas, S., & Schwartz, S. H. (1993). Effects of intergroup similarity on intergroup relations. *European Journal of Social Psychology*, 23(6), 581–595.
- Rudman, L. A., & Goodwin, S. A. (2004). Gender Differences in Automatic In-Group Bias: Why Do Women Like Women More Than Men Like Men? *J Pers Soc Psychol*, 87(4), 494-509.
- Rutgers University. (2016). History of Women in the U.S. Congress. Retrieved 2016, from <http://www.cawp.rutgers.edu/history-women-us-congress>
- Schmader, T. (2002). Group Identification Moderates Stereotype Threat Effects on Women's Math Performance. *Journal of Experimental Social Psychology*, 38, 194-201.



- Schmitt, M. T., Lehmiller, J. J., & Walsh, A. L. (2007). The Role of Heterosexual Identity Threat in Differential Support for Same-Sex 'Civil Unions' versus 'Marriages'. *Group Processes & Intergroup Relations*, 10(4), 443-455.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. *Psychological Science*, 18(5), 429-434.
- Sidanius, J., & Pratto, F. (1999). *Social Dominance: An Intergroup Theory of Social Hierarchy and Oppression*. Cambridge, United Kingdom: Cambridge University Press.
- Spoor, J. R., & Schmitt, M. T. (2011). "Things Are Getting Better" Isn't Always Better: Considering Women's Progress Affects Perceptions of and Reactions to Contemporary Gender Inequality. *Basic and Applied Social Psychology*, 33(1), 24-36.
- Stout, J. G., Dasgupta, N., Hunsinger, M., & McManus, M. A. (2011). STEMing the tide: Using ingroup experts to inoculate women's self-concept in science, technology, engineering, and mathematics (STEM). *J Pers Soc Psychol*, 100(2), 255-270.
- Tajfel, H. (1982). Social Psychology of Intergroup Relations. *Annual Review of Psychology*, 33, 1-39.
- Tajfel, H., & Turner, J. C. (1986). The Social Identity Theory of Intergroup Behavior. In J. T. Jost & J. Sidanius (Eds.), *Political psychology: Key readings in social psychology* (pp. 276-293). New York, NY, US: Psychology Press.
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness*: Yale University Press.
- Treating the fair sex fairly. (August 9, 2014). *The Economist*.
- UK Government. (2011). *Women on Boards. 2013*, from <https://www.gov.uk/government/news/women-on-boards>
- UK Government. (2013). *Women on Boards: two years on. 2013*, from <https://http://www.gov.uk/government/news/women-on-boards-two-years-on>

- UN Women. (2015). Women's leadership and political participation. Retrieved May 2015, from <http://www.unwomen.org/en/what-we-do/leadership-and-political-participation>
- Van Vugt, M., De Cremer, D., & Janssen, D. P. (2007). Gender Differences in Cooperation and Competition: The Male-Warrior Hypothesis. *Psychological Science*, 18(1), 19-23.
- Wechsler, H., Nelson, T. F., Lee, J. E., Seibring, M., Lewis, C., & Keeling, R. P. (2003). Perception and Reality: A National Evaluation of Social Norms Marketing Interventions to Reduce College Students' Heavy Alcohol Use. *Journal of Studies on Alcohol*, 64, 484-494.
- Werch, C. E., Pappas, D. M., Carlson, J. M., DiClemente, C. C., Chally, P. S., & Sinder, J. A. (2000). Results of a Social Norm Intervention to Prevent Binge Drinking Among First-year Residential College Students. *Journal of American College Health*, 49(2), 85-92.
- Willer, R., Rogalin, C. L., Conlon, B., & Wojnowicz, M. T. (2013). Overdoing Gender: A Test of the Masculine Overcompensation Thesis. *American Journal of Sociology*, 118(4), 980-1022.

## **Chapter 4:**

### **Changes in Men's Gender Attitudes: Evidence from Post-Revolutionary Egypt**

#### 4.1. Introduction

For decades now, international agencies and academics have deemed women's economic and political empowerment as important components in determining a region's development prospects (Duflo, 2011; World Bank, 2004, 2013). However, engaging men and garnering their support and cooperation is necessary to successfully achieve gender equality (UN Women). Men's gender role attitudes have widely been associated with, if not instrumental in shaping, women's status in the household, labor force, and political leadership (Bertrand, Kamenica, & Pan, 2015; Duflo & Topalova, 2004; Fortin, 2005). For example, in Ethiopia, female entrepreneurs who had the support and encouragement of their husbands were significantly more likely to enter into traditionally male-dominated sectors that are more profitable than traditional female sectors (Pierotti, Alibhai, Buehren, & Campos, 2016).

Economic efficiency and bargaining power (Iversen & Rosenbluth, 2010), traditional agricultural practices (Alesina, Giuliano, & Nunn, 2013), and religious roots (Inglehart & Norris, 2003; Norris, 2009) may have served as origins for the social norms that influence anti-egalitarian gender attitudes. However, while the role and origins of gender attitudes have garnered much attention in recent years, there is still much to be learned about *changes* in men's gender attitudes. Research has shown that attempting to even gently nudge men towards making more gender diverse decisions without updating their internalized gender attitudes could lead to backlash against women (Paryavi, Bohnet, & van Geen, 2016). Therefore, it is imperative to increase our understanding of how changes in men's support for women's greater empowerment could be possible. This paper aims to aid in this quest by studying men's gender attitudes during the tumultuous aftermath of the 2013 Egyptian Revolution.

Egypt is in a region known for its persistent gender inequality and perhaps in the greatest need for gender attitudes to shift than anywhere else in the world. Compared to all other regions, fewer women hold public office (Appendix C Figure C.1) and work outside of the home (Appendix C Figure C.2) in the Middle East and North Africa (MENA). This makes it more likely for men to be in positions of power in the labor force and the political sphere than anywhere else in the world. Men's level of influence could allow them the ability to shape general attitudes towards women and their access to opportunities. In fact, Ross (2008) argues that it is men's increased political influence (as a result of oil reducing women's role in the work force and their political influence), which perpetuates strong pre-existing patriarchal norms, laws and institutions in the Middle East. Moreover, as key actors within the household, men can also impact their wives and daughters' education, marriage and career decisions. Therefore, the MENA region's men can play a significant role in changing or perpetuating gender norms and how they influence women's opportunities, decisions, and their empowerment within the home and the public sphere.

Understanding if and why men shift their gender attitudes could inform the design of many policy and development programs that cannot successfully achieve their objectives of closing gender gaps without addressing the issues of "the other half" and bringing men on board (World Bank, 2006). A long-term study of electoral quotas in India has found that men's attitudes towards women's participation in public and household decision-making improve if they had previous exposure to female village leaders (Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2009). At the same time, a two-year development program mandating women's local governance participation in rural Afghanistan villages did not produce any changes in gender attitudes (Beath, Christia, & Enikolopov, 2013). Clingingsmith, Khwaja, and Kremer (2009)

found that the Hajj experience, which only lasts a few days, increased positive attitudes towards women that support their fairer treatment within Islam. Still, little is known about how these gender attitudes can change, especially in the Middle Eastern cultural context, without significant shifts in the deeply entrenched patterns and codes of behavior (i.e. social norms), and what factors could promote these changes.

This paper uses the unique experiences of the Egyptian people in the aftermath of the 2011 Revolution to examine changes in men's attitudes towards women's role in society. It does so by exploiting the forceful disturbance of the status quo in Egypt brought on by the people overthrowing a long-standing dictatorship and subsequently experiencing political crisis and turmoil that resulted in many social, political and economic grievances. These boisterous political shocks were heard around the world and could be associated with Egyptians updating many of their perspectives, with attitudes towards women's role in society possibly being amongst them. To examine if this was the case, survey responses from the summer of 2011, immediately after the events of the Egyptian Revolution, was compared to responses in the midst of the Egyptian crisis in 2013. To assess Egyptian men's gender attitudes, responses to questions regarding women's competence as political leaders, and support for employment of married women and university education for girls were carefully examined.

The first level results revealed that, the Egyptian political crisis was highly correlated with men holding more egalitarian gender attitudes. All else equal, compared to Egyptian men in 2011, those in 2013 were significantly more likely to believe in female political leadership competence, and support employment of married women and university education of girls. In addition, Egyptian men experienced the most significant positive changes in these gender attitudes than other Arab men covered in the survey. Given men's influence in Egyptian society

as in elsewhere in MENA, these changes in their gender attitudes could, in time, lead to shifts in behaviors and social norms, which could improve women's status in the household and their access to opportunities in the public sphere.

Further analysis suggests that decreased credibility of religious leaders was significantly associated with men's higher confidence in women's political leadership ability and support for women's entry into the workforce (i.e. both traditionally male domains). In contrast, men's increased support for women in a more gender-neutral domain (higher education) was not correlated with their attitudes towards religious leaders. Instead, support for girls' university education was experienced amongst men from financially struggling households and was highly associated with their increased concerns regarding the availability of suitable employment for women.

Moreover, men's updated gender attitudes do not appear to be part of broader changes in their worldviews as a result of the aftermath of the Revolution. While a greater share of men supported a political system that is not influenced by religious leaders, both individuals with secular and non-secular political orientations significantly improved their gender attitudes. In addition, support for Islamic law remained high amongst both secular and non-secular individuals, with non-secular men gravitating towards more conservative interpretations of Islam. This suggests that changes in men's gender attitudes between 2011 and 2013 may be reflecting their desires for better treatment of women within Islam, especially amongst men who supported a government that is influenced by religious leaders. This could be as a result of significant media coverage of Egyptian women's significant and continuous political involvement and the increased dialogue about the extreme marginalization and mistreatment of Egyptian women after the Revolution. These insights can significantly inform the understanding

of how men's attitudes towards women's roles in society could be changed in the Middle Eastern cultural context.

This paper is organized as follows: Section 4.2 reviews the Egyptian context; Section 4.3 lays out the theoretical framework; Section 4.4 outlines the data sources and empirical strategy; Section 4.5 presents the results; and Section 4.6, discusses the results and concludes.

## **4.2. The Egyptian Context**

The traditional gender norms that define women as homemakers and the public sphere (i.e. politics and labor market) as the men's domain are deeply engrained in Middle Eastern and North African countries, including Egypt (World Bank, 2004, 2013). Before the Egyptian revolution and political crisis, Egypt adopted a gender quota in 2009, reserving 64 parliamentary seats for women (QuotaProject, 2014), with women holding 12.7 percent of seats after the 2010 elections (Inter-Parliamentary Union, 2016). This was still amongst the lowest rates of female political representation in the world (Appendix C Figure C.1). Additionally, despite benefiting from healthy rates of economic growth between 2000 and 2010 (World Development Indicators, 2015), Egyptian women did not experience much improvement in their labor force participation rates, even across industries (World Bank, 2013). This is a similar story to the rest of MENA, where the region has not experienced significant increases in female political representation and labor force participation rates, which are amongst the lowest globally (Appendix Figures A.1 and A.2).

When it comes to education, however, the enrollment rates in MENA countries are similar between men and women below tertiary level, and women even have the edge in tertiary education enrollment (Salehi-Isfahani, 2013; World Bank, 2013). In 2012, total tertiary enrollment was 28 percent for men and women followed closely at 27 percent (World



Development Indicators, 2015). Support for girls' university education could still be motivated by the gendered division of spheres given the perceptions that higher education levels improve young women's chances in the marriage market. Nevertheless, Egyptian children from lower income backgrounds tend to be at a disadvantage by not having the resources to invest in education beyond primary or secondary level as compared to the more educated youth who tend to be more financially well-off (Salehi-Isfahani, 2013). This is further supported by the fact that access to tertiary education in Egypt is heavily rationed and highly unequal given the influence of family resources (Assaad, 2010). Despite free education at all levels, given poor school qualities and excessive reliance on costly private tutoring in order to pass college entrance exams, many children from poor households face large drop-out rates during earlier stages of schooling (Rizk & Abou-Ali, 2016). Female children from lower income households could be at a particular disadvantage given the gender bias in schooling investments, with preference given to boys' education (Dancer & Rammohan, 2007).

Hope for greater women's empowerment came in 2011, during the Egyptian Revolution, which was part of a region-wide uprising, called the "Arab Spring" that profoundly disturbed the region's complacency with the status quo and brought with itself significant hope for change. Arguably the Arab Spring was inspired by the events in Tunisia, where on December 17, 2010, Mohammed Bouazizi, a young grocery vendor, set himself on fire after his products were confiscated by the police (Ansani & Daniele, 2012). In the days that followed, an uprising spread across the country and before long, across the Arab world, with protests breaking out in Egypt, Morocco, Algeria, Bahrain, Yemen, Jordan, Oman and Syria.

By February 2011, Egyptians succeeded in overthrowing Hosni Mubarak, who had been in power since 1981, and were filled with an increased sense of optimism (Abdel Gawad Soltan,

Nagui Qamha, & ‘Asilah, 2011). During the revolution, women from all ages and social groups served as “agents of change” from protesting alongside men, leading marches, to mobilizing demonstrations through their blogs and online social networks (Naber, 2011). When the unifying goal of overthrowing a dictatorship was accomplished and the transition began, women continued to ask for a voice in building Egypt’s future. However, they were quickly marginalized and even started experiencing violent attacks and backlash (AlJazeera, 2011; Chick, 2011). In fact, by July 2011, the previous quota for women was abolished in the new electoral law—while each political party was required to include one woman amongst their candidates, women lost their 64 reserved seats in the parliament (Inter-Parliamentary Union, 2016).

In large part, the extreme marginalization of women after Arab Spring has been blamed on the resurgence of masculine patriarchal ideologies as a result of the religious-based political manipulations of the time (Coleman, 2012). This rise of religious political discourse succeeded in gaining momentum, perhaps as a strategic reaction amongst secular individuals to the previous secular regime (Tessler, 2015), and an ideological one for non-secular individuals.

Consequently, the Muslim Brotherhood swept Egypt’s parliamentary elections. Only two percent of 508 elected parliamentarians were women, which was a significant decline from the previous 12 percent (Bachelet, 2012; Inter-Parliamentary Union, 2016).

Moreover, while still under military rule, only ten months after the Revolution, on December 15, 2011, video of a young Egyptian female protestor being disrobed and beaten by army soldiers went viral (known as the “Blue bra girl”), sparking uproar and fueling anger around the world and within Egypt. It dominated Egyptian TV shows, “hogged the front page of newspapers and became a hot topic in the streets” and as expressed by one commentator, “This

picture has become an international scandal that puts any Egyptian to shame” (Zayed, December 21, 2011). It incited a new wave of protests with male and female protestors returning to Tahrir square to show their support for Egyptian women (Higgins, December 20, 2011).

Finally, in July 2012, the Muslim Brotherhood backed Mohamed Morsi was sworn in as President. Not long after, political turmoil ensued and continued to escalate. By the start of 2013, protestors returned to Tahrir Square on the second anniversary of the uprising that overthrew Mubarak, as Egyptians reacted to President Morsi granting himself more power through a constitutional decree (Blair, Taylor, & Perry, 2013). While the revolution started with an air of change and optimism, by 2013, Egypt was in the midst of unrelenting political turmoil with heightened distrust in the leadership and increasing political and economic concerns. Although GDP growth was healthy and positive for years until the end of 2010, which was at 5.1%, it declined significantly to 1.8 percent right after the revolution in 2011, and was at 2.2 percent in 2012, on the cusp of the crisis. There were shortages of diesel, power cuts, Egyptian currency depreciation, and rising inflation that hit 9.75 percent in June 2013, with many Egyptians blaming government incompetence (Blair et al., 2013). In addition, women’s rights continued to be a significant part of the ongoing conflict in Egypt. Revolutionaries were fighting for equality, but reactionary forces, including the Brotherhood and Mubarak’s regime, were fighting to impose and secure men’s authority over women (Al Aswany, December 8, 2013).

Therefore, the aftermath of the Egyptian Revolution was a period of rising social and economic grievances, continuous protests and revolts that ultimately led to the failure of the Muslim Brotherhood and removal of Morsi by the Egyptian military in July of 2013. These boisterous events would be expected to catalyze those who have experienced them to reevaluate

many of their attitudes and perspectives, which could also include their attitudes towards women's role in society.

The next section presents the theoretical framework as to how the events in post-Revolutionary Egypt could be associated with shifts in men's gender attitudes.

### **4.3. Theoretical Framework**

This paper aims to study how men's gender attitudes are associated with the tumultuous aftermath of the Egyptian Revolution. The Egyptian political crisis may be associated with men changing their attitudes towards women's role in society as a result of possible shifts in social norms, information availability and exposure to women's presence in the public sphere, opinions and worldviews, and economic and political concerns. Each is discussed in turn.

As stressed in much of the literature on gender norms, changes in deeply engrained social norms and religious and cultural traditions take considerable time (Iversen & Rosenbluth, 2010). Given their stickiness, rapid changes in social norms and traditions would not be expected even in the midst of a political crisis, and therefore, not likely associated with changes in men's gender attitudes. Furthermore, research has shown that a one-time informational intervention in the gender domain, in the form of a descriptive norm nudge, does not impact men's decisions when the information favors men, and leads to backlash against women when the information favors women (Paryavi et al., 2016). This is supported by evidence from immediately after the Revolution, when women received public backlash (AlJazeera, 2011; Chick, 2011) as their role in the Revolution was receiving more focused attention in the media with messages such as: "Arab women lead the charge for political change" (Mekay, 2011). At the same time, Jensen and Oster (2009) found that introduction of Cable TV improved the status of women in India, with women reporting lower fertility, son preference, more autonomy and more disapproval of

spousal abuse. Combined, these insights and studies suggest that short-term informational interventions may not be associated with shifts men's internalized gender attitudes (and may even be associated with backlash based on their existing attitudes). However, more long-term informational interventions may be associated with changes in gender attitudes.

Along the same lines, increases in men's exposure to women's greater participation in the public sphere (e.g. voting in elections, participating in protests) in the aftermath of the Revolution could be associated with men updating their beliefs about women's role in society. However, in a study of electoral quotas in India (Beaman et al., 2009), exposure to female village leaders has been shown to improve men's attitudes towards women's participation in public and household decision-making in the long-term. In addition, a two-year development program mandating women's local governance participation in rural Afghanistan villages did not produce any changes in gender attitudes (Beath, Christia, & Enikolopov, 2013). The authors attributed this result to two possible factors: strict household restrictions faced by women in rural Afghanistan and the short duration of exposure under the program.

Despite similar religious backgrounds shared by Afghanistan and Egypt, culturally, women's household restrictions in rural Afghanistan may not be comparable to those faced by all Egyptian women, especially during revolutionary times. Without a program mandating their political participation, Egyptian women were "agents of change" and a notable part of the efforts that brought down Mubarak's regime (Naber, 2011). Moreover, after the Arab Spring, Arab women's public sphere participation received global attention when the first Arab woman, Yemen's Tawakkul Karman, was awarded the Nobel Peace Prize for her "non-violent struggle for the safety of women and for women's rights to full participation in peace-building work" (2011). She has been called the "Mother of the Revolution" by Yemenis and was globally

recognized for her work as a female Arab politician, journalist, and activist who also happened to be a mother (Al-Shamahi, October 9, 2011). Additionally, in studying the impact of the Hajj pilgrimage, which exposes individuals to men and women from around the world, Clingingsmith, Khwaja, and Kremer (2009) found that the Hajj experience increased positive attitudes towards women and their abilities (i.e. regarding women's spirituality, concerns for their safety and quality of life, girls' education and women's participation in the workforce). Together, the increased exposure to women's participation in the public sphere and heightened televised and media coverage of their participation and struggles for equality in post-Revolutionary Egypt, may be associated with men shifting towards adopting more egalitarian gender attitudes.

Additionally, given the increased political awareness, and the fact that women's rights continued to be a significant part of the ongoing conflict in Egypt, men's gender attitudes could be associated with public opinion changes in response to elite-driven communications (Zaller, 1992). The continuous failures of the religious regime and their marginalization and mistreatment of women could have discredited their messages that promoted extreme masculine patriarchal ideologies with regard to women's role in society (Coleman, 2012), and shifted opinions towards those who were fighting for gender equality (Al Aswany, December 8, 2013). Moreover, the widespread discontent with the performance of the Islamist government could have encouraged more secular worldviews that could also include more egalitarian gender attitudes (Norris & Inglehart, 2004). However, changes in gender attitudes and changes secular views may not necessarily move in the same direction in an Islamic cultural context, such as the one in Egypt. Clingingsmith et al. (2009) found that Hajj improved positive attitudes towards women, but Hajjis did not experience a change in their attitudes towards Islamic doctrines that

determine women's inheritance and personal status in the family (i.e. marriage and divorce rights). The authors concluded that this reflects Hajjis' "movement away from local prejudices against women and toward fairer treatment within Islam, rather than a more general trend toward feminism."

Moreover, the development literature has long argued that gender is "relational," with men and women's relationships being negotiable (Cleaver, 2003; World Bank, 2006). Therefore, the increased economic grievances after the Revolution may be associated with more men being accepting of women entering the labor force to supplement their family's income. In addition, in the face of increased job market concerns in the aftermath of the Revolution, men from low-income households may be more likely to negotiate the importance of girls' university education in order to improve their competitiveness in the labor and/or marriage market. Also, the disappointments of a male-dominated government and leadership may be correlated with men being more open to female political leaders.

Overall, the Egyptian political crisis was a time of heightened attention to women's participation and mistreatment, continuous debates about the role of women in society, disappointment with religious elites, and significant economic and political grievances. All of these elements could have encouraged men to reevaluate their worldviews and attitudes towards women. As a result, compared to men immediately after the Revolution, those in the midst of the Egyptian political crisis and turmoil would be expected to hold more egalitarian gender attitudes.

The following section presents the data and empirical strategy used to test this hypothesis and examine the possible factors associated with men's gender attitude changes.

#### 4.4. Data and Empirical Strategy

To study changes in men’s gender attitudes in post-revolutionary Egypt, the analysis relied on individual level data from the second and third waves of the Arab Barometer (AB) survey (Jamal et al., 2014; Tessler et al., 2015).<sup>23</sup> The second wave survey was conducted in the summer of 2011, immediately after the events of the Egyptian Revolution, and the third wave survey data was gathered in 2013, in the midst of the crisis that followed (Table 4.1). Appendix C Table C.1 presents the key demographics of the respondents for each survey. Given the similar sampling techniques and methods used across the two waves (Appendix C Table C.2), the minor differences in demographic variables were easily controlled for in the analysis in order to closely examine changes in men’s gender attitudes in the aftermath of the Revolution.

Table 4.1: The Egyptian Revolution, Aftermath and Survey Timeline

January 25, 2011	“Day of Anger”, First major protests break out across Egypt
February 11, 2011	Mubarak steps down
March 2011	Women attacked during a rally on International Women’s Day
<b>Arab Barometer Survey (June 16 – July 3, 2011)</b>	
October 2011	The first Arab woman, Yemen’s Tawakkul Karman, was awarded the 2011 Nobel Peace Prize
November 2011	Egypt holds parliamentary elections, with Muslim Brotherhood Sweeping elections in November 28, 2011
December 2011	Protests break out in response to the “Blue Bra girl” incident
June 30, 2012	Morsi sworn in as President
November 21, 2012	Morsi grants himself more power
November 29, 2012	Islamists finish draft constitution
December 4, 2012	Egyptians march on presidential palace to protest the draft constitution and Morsi’s new powers
January 25, 2013	Protesters return to Tahrir Square
February-March 2013	Protests spread across Egypt
<b>Arab Barometer Survey (March 31 – April 7, 2013)</b>	
June 30, 2013	Protests ignite with millions of Egyptians pouring into the streets and calling for Morsi to step down
July 3, 2013	Military removes Morsi from office
July 4, 2013	A new interim president steps in
September 12, 2013	Egypt extends state of emergency

Source: Childress (2013), Reuters (2011), The Nobel Foundation (2011)

<sup>23</sup> Egypt was not covered in the first wave of the survey.



The surveys included three questions that assessed individual gender attitudes. First, to evaluate men’s attitudes towards women in political leadership (i.e. a traditionally male domain), participant’s responses to the following statement were used: *“In general, men are better at political leadership than women.”* A binary variable, *womenpoliticians*, was created with responses being coded as, 1, if individuals stated that they “Strongly disagree” or “Disagree” and, 0, if individuals “Strongly agree” or “Agree” with the statement. Secondly, to assess men’s attitudes towards women in the labor force (i.e. another traditionally male domain), and their perceptions women as homemakers, *womancanwork*, variable was created. It equaled, 1, if the respondent “Strongly agreed” or “Agreed” and, 0, if the respondent “Disagreed” or “Strongly disagreed” with the following statement: *“A married woman can work outside the home.”* Given that it is expected for married women to be financially supported by their husbands in MENA’s society, any shifts in responses to this variable could capture men’s attitude towards women in the labor force (i.e. are women welcome in the labor market even if they are assumed to have financial backing?). Lastly, to evaluate attitudes towards girls’ university education, a binary variable, *uni4girls*, was coded as, 1, if the respondent “Strongly disagreed” or “Disagreed” and, 0, if the respondent “Agreed” or “Strongly agreed” with the following statement: *“University education for males is more important than university education for females.”* These dependent variables are summarized in Table 4.2.

Table 4.2: Binary dependent variables: Gender Attitudes

<b>Dependent Variables (Gender Attitudes)</b>			
<b>Gender Attitude Under Study</b>	<b>Variable</b>	<b>Corresponding Survey Question</b>	<b>Data Coding</b>
Women as political leaders	<i>womenpoliticians</i>	“In general, men are better at political leadership than women.”	1 if strongly disagree or disagree; 0 if strongly agree or agree
Women in the labor force	<i>womancanwork</i>	“A married woman can work outside the home.”	1 if strongly agree or agree; 0 if strongly disagree or disagree
Importance of girls’ university education	<i>uni4girls</i>	“University education for males is more important than university education for females.”	1 if strongly disagree or disagree; 0 if strongly agree or agree

To examine the changes in men’s gender attitudes in post-Revolutionary Egypt, the following probit regression specifications were evaluated for each of the gender attitude measures:

$$P(\text{womenpolitians} = 1 | \text{year2013}, X_{ic}) = \Phi(\beta_0 + \beta_1 \text{year2013} + \beta_{ic} X_{ic}) \quad (1)$$

$$P(\text{womencanwork} = 1 | \text{year2013}, X_{ic}) = \Phi(\beta_0 + \beta_1 \text{year2013} + \beta_{ic} X_{ic}) \quad (2)$$

$$P(\text{uni4girls} = 1 | \text{year2013}, X_{ic}) = \Phi(\beta_0 + \beta_1 \text{year2013} + \beta_{ic} X_{ic}) \quad (3)$$

where *year2013* , is a binary year variable that equals, 1, if the survey year is 2013 and, 0, if the survey year is 2011, and vector,  $X_{ic}$  , represents individual and household characteristics for each respondent.<sup>24</sup> Evaluated at means, the estimated coefficient of the *year2013* variable,  $\beta_1$  , yields the probably that an average Egyptian man will have an egalitarian gender attitude in the midst of the crisis in 2013 as compared to an average Egyptian man in 2011.

To further confirm that changes in Egyptian men’s gender attitudes were correlated with the Egyptian political crisis, and not as part of a regional trend, any observed changes were also compared with shifts in gender attitudes of other men in the region during the same time period. These include men from Tunisia and Yemen, who also experienced revolutions in the wake of the Arab Spring, and men from other Arab nations in the survey (Algeria, Iraq, Jordan, Sudan, Palestine, and Lebanon). Appendix C Table C.3 presents detail descriptions of political events for each country and their corresponding survey timelines. Comparisons regarding men’s attitudes towards female political leadership were also made using 2008 data (latest available

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<sup>24</sup> These include the individuals’ employment status, marital status, education level, and whether they reside in an urban area: Age, employment status (1 if employed, 0 if not employed, housewife, student or retired), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), whether individual is bilingual, and urban vs. rural (1 if urban, 0 if rural) are also controlled for. Variables regarding the financial status of the household (1 if household has sufficient income to cover expenses, 0, otherwise), whether their home is owned vs. rented are also included.

data from before the Egyptian revolution) from the World Value Survey<sup>25</sup> as an additional check on whether the 2011 revolution itself was immediately associated with changes in men’s attitudes.

The next stage of the empirical analysis focused on examining whether men’s increased political and economic concerns are associated with any observed changes in their gender attitudes (Table 4.3). To assess if men’s disappointment with the government and political leadership were correlated with greater confidence in female political leadership a number of government satisfaction and leadership trust variables were individually added to Model (1). To examine if increased economic worries were correlated with men’s attitudes towards women’s employment, men’s assessments of the current economic situation (*bad\_economy*) and outlook on the future of Egypt’s economy (*poor\_ec\_outlook*) were added to Model (2). Each was also evaluated separately for men who were from financially secure and those from financially struggling households.<sup>26</sup>

Table 4.3: Government Satisfaction, Leadership Trust and Economic Concern Variables

Relevant Gender Attitude	Possible Association	Variable	Corresponding Survey Question	Data Coding
<b>Government Performance evaluation variables</b>				
Women as political leaders	Satisfaction in the government’s performance of tasks and duties	<i>gov_satisfaction</i>	Suppose that there was a scale from 1-10 to measure the extent of your satisfaction with the government now, in which 1 means that you were absolutely unsatisfied with its performance and 10 means that you were very satisfied, to what extent are you satisfied with the government’s performance?	1 if individuals rate their satisfaction with the government at 7,8,9, or 10, and 0, otherwise.

<sup>25</sup> The World Value Survey only included one of the gender attitude questions under study in this paper. The question was framed as: “Do you strongly agree, agree, disagree, or strongly disagree? On the whole, men make better political leaders than women do.” 1: Strongly Agree, 2: Agree, 3: Disagree, 4: Strongly Disagree” Responses were coded as 1, if individuals “disagreed” or “strongly disagreed”, and 0, if individuals “strongly agreed” or “agreed” with the statement.

<sup>26</sup> Financially secure households were defined as those in which individuals stated that their household income covers their expenses “well and we are able to save” or “without notable difficulties.” Individuals who responded that their household income does not cover their expenses and they face “significant difficulties” or “some difficulties” in meeting their needs were categorized as being from households that are financially struggling.

Table 4.3 (Continued)

Women as political leaders	Perception of government corruption	<i>gov_corruption</i>	Do you think that there is corruption within the state's institutions and agencies?	1 if "yes", 0 if "no"
Women as political leaders	Satisfaction with democratic transition management	<i>gov_demtransition</i>	How would you evaluate the current government's performance on Managing the democratic transition process?	1 if very good or good and 0, otherwise
<b>Political leadership credibility variables</b>				
Women as political leaders	Distrust in government	<i>gov_distrust</i>	To what extent do you trust: The government (the cabinet)	1 if trust to a limited extent or absolutely do not trust; 0 if trust to a great or medium extent
Women as political leaders	Distrust in Muslim Brotherhood	<i>MB_distrust</i>	To what extent do you trust: The Muslim Brotherhood	1 if trust to a limited extent or absolutely do not trust; 0 if trust to a great or medium extent
<b>Economic concern variables</b>				
Women in the labor force	Poor evaluation of Egypt's current economy	<i>bad_economy</i>	How would you evaluate the current economic situation in your country?	1 if very bad or bad; 0 if very good or good
Women in the labor force	Poor outlook on Egypt's economic prospects	<i>poor_ec_outlook</i>	What do you think will be the economic situation in Egypt during the next few years (3-5 years) compared to the current situation?	1 if much worse or somewhat worse; 0 if almost the same as current situation, somewhat better or much better
<b>Job Market concern variables</b>				
Importance of girls' university education	Reduction in suitable government jobs	<i>fewer_jobs</i>	Generally speaking, how would you evaluate the performance of the government in carrying out its tasks and duties?	1 if very bad or bad; 0 if neither good or bad, good or very good
Importance of girls' university education	Difficult job market entry	<i>tough_market_entry</i>	Some people say that nowadays it is impossible to obtain a job without connections, while others say that jobs are only available to qualified candidates. Based on a recent experience (or experiences) you are personally aware of, do you think that...?	1 if "Obtaining employment through connections is extremely widespread"; 0 if "Employment is sometimes obtained through connections." or "Employment is obtained without connections."

Lastly, to study if men's increased job market concerns are associated with their attitudes towards girls' university education, evaluations of availability of jobs (*fewer\_jobs*) and job market entry challenges (*tough\_market\_entry*) were added to Model (3) regressions, and

evaluated by financial status of the individual's household. In Egypt, the government is the most common and preferred employer of women given the work conditions and shorter hours that allow for balance with their domestic duties, especially after marriage (Barsoum, 2014; Hendy, 2015). Given financial support from their families, young women from higher income households can afford to increase their educational attainment and delay work (and marriage) until they find suitable employment (or spouse) (Salehi-Isfahani, 2013). However, the instability brought on by the political crisis and government's continued failures could be correlated with men's increased concerns regarding ease of finding suitable employment for women in the public or private sector, especially among financially struggling households.

Additionally, to assess if discontent with religious leaders and credibility of their conservative patriarchal messages are correlated with men having more egalitarian gender attitudes, individuals' trust in religious leaders were also analyzed with respect to all three gender attitude measures. The religious distrust variable, *religlead\_distrust*, was coded to equal 1, if individuals stated that they "absolutely do not trust" their religious leaders or "trust [them] to a limited extent," and 0, if they trust them "to a medium" or "great extent".

It could also be that as individuals react to the failings of the Islamist government in the aftermath of the Revolution, changes in attitudes towards religious leaders and women are part of a broader shift in their worldviews from a more traditional mindset, to a more "modern" one. Therefore, the next level of analysis sought to examine if this was the case by analyzing differences in men's attitudes on a range of issues from 2011 to 2013 that included their views on leadership trust and credibility, government's performance, gender equality, democracy, political role of Islam, and different interpretations of Islamic tenets. These changes were evaluated separately for individuals with secular and non-secular political orientations given that

their worldviews could respond differently to the failings of the Islamic government. Following Jamal and Tessler (2008)<sup>27</sup> individuals were identified as supporting a secular political system if they “Strongly Disagreed” or “Disagreed” with the following statement: “*Religious leaders (imams, preachers, priests) should have influence over government decisions.*” Individuals who “Agreed” or “Strongly Agreed” with this statement were identified as supporting a political system where Islam plays a significant role. Respondents were labeled as “Secular” and “Non-Secular,” respectively.

The next section proceeds with presenting the key results from the outlined analysis.

#### **4.5. Results**

The following sections present the results on changes in Egyptian men’s gender attitudes (Section 5.1), whether these changes are associated with their political and economic concerns (Section 5.2), and part of changes in men’s worldviews in the aftermath of the Revolution (Section 5.3). Each will be discussed in turn.

##### **4.5.1. Changes in Men’s Gender Attitudes**

The Egyptian crisis that followed the Revolution seems to be associated with men significantly updating their gender attitudes (Figure 4.1). With regard to confidence in female political leadership, compared to World Value Survey data from before the Egyptian revolution, only 5.6 and 6.8 percent of men disagreed with men being better political leaders than women in 2008 and 2011, respectively ( $p = 0.346$ ).<sup>28</sup> This suggests that the revolution itself did not significantly “treat” men’s gender attitudes and 2011 data can be used as a baseline comparison

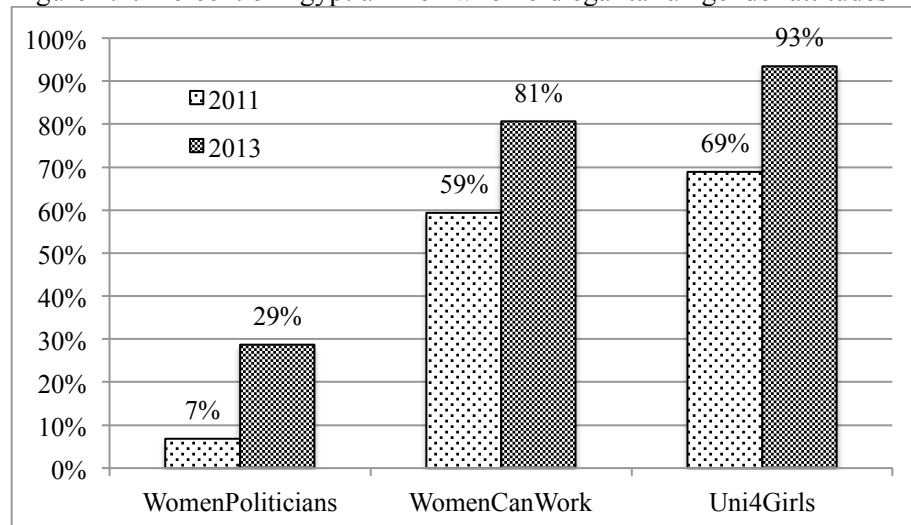
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<sup>27</sup> Jamal and Tessler (2008) further classified individuals by their support for democracy to evaluate differences amongst those who want a secular democracy and those who want a democratic political system where Islam plays a significant role.

<sup>28</sup> All reported  $p$ -values represent two-sample t-test of means.

for the analysis. In fact, while in 2011 only 6.8 percent of men disagreed with the statement that men are better at political leadership than women, in 2013, 28.6 percent of men disagreed ( $p$ -value = 0.000).<sup>29</sup> This is a significant 22-percentage point increase during the same time as the Egyptian political crisis.

Figure 4.1: Percent of Egyptian men who hold egalitarian gender attitudes



Furthermore, the Egyptian crisis seems to be significantly correlated with men's increased support of women's employment. In fact, the percentage of men who believed that a married woman can work outside of the home increased by 22 percentage points in 2013 ( $p$ -value = 0.000). The Egyptian crisis appears to also be associated with men updating their beliefs regarding the importance of university education for girls. By 2013, 75.6 percent of men disagreed with the statement that university education is more important for boys than girls, which is significantly higher than the 60.5 percent of men who disagreed with this statement in 2011 ( $p$ -value = 0.000). All of these gender attitude changes are confirmed by the regression

<sup>29</sup> It should be noted that Egyptian women also significantly updated their beliefs about women's competence as political leaders. While in 2011, only 11 percent of women disagreed with the statement that men are better political leaders than women, in 2013, 36.7 percent of women disagreed ( $p$ -value = 0.000). Similar to the case of Egyptian men, when comparing the Egyptian women with their counterparts in the rest of the countries covered in the last two waves of the Arab Barometer, in 2011, Egyptian women demonstrated the strongest level of agreement with the belief that men are better at political leadership than women. However, in 2013, Egyptian women experienced the greatest shift towards having confidence in female political leadership capacities.

analysis in Table 4.4, with the 2013 year variable being positively and significantly associated with men’s confidence in female political leadership (Column (1)), support for married women’s employment (Column (2)) as well as girls’ university education (Column (3)). Additionally, Egyptian men experienced some of the greatest increases as compared to men in other Arab countries surveyed during this time period (Appendix Figures C.3, C.4 and C.5).<sup>30</sup>

Table 4.4: Probit Regression for Men’s Gender Attitudes, Marginal Effects at Means

	(1)	(2)	(3)
	Confidence in Female Political Leadership	Support for Married Women’s Employment	Support for Girls’ University Education
Year2013	0.226*** (0.022)	0.198*** (0.026)	0.149*** (0.027)
Employed	0.005 (0.015)	0.008 (0.042)	0.043 (0.041)
Married	-0.021 (0.019)	-0.067 (0.046)	-0.027 (0.044)
Tertiary Education	0.033 (0.026)	0.162*** (0.050)	-0.005 (0.054)
Secondary Education	0.012 (0.018)	0.037 (0.043)	0.007 (0.044)
Primary Education	0.032 (0.023)	0.036 (0.049)	0.045 (0.048)
Observations	1,174	1,181	1,174
Pseudo-R2	0.120	0.083	0.033

Notes: The table presents Probit regression results with marginal effects at means reported in percentage points with 2011 as the baseline comparison in all columns. The dependent variable in Column (1) is a binary variable that equals 1 if individuals disagree with men being better political leaders than women, and 0 otherwise. The dependent variable in Column (2) is support for married women working outside of the home, which equals 1 if individual agrees that a married woman can work outside the home, and 0, otherwise. The dependent variable in Column (3) is a binary variable that equals 1 if individual disagrees with university education being more important for a boy than a girl, and 0 otherwise. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual, whether their home is owned vs. rented, financial status of the household (1 if household has sufficient income to cover expenses, 0, otherwise) and age are also controlled for. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

<sup>30</sup> Appendix C, Table C.3 presents detail descriptions of political events for each country and their corresponding survey timelines.



Therefore, as hypothesized, more Egyptian men in post-Revolutionary Egypt updated their gender attitudes. They significantly increased their support for women as political leaders, women in the labor market, and girls' university education. The next section examines the possible association between these changes in men's gender attitudes and their increased political and economic concerns in post-Revolutionary Egypt.

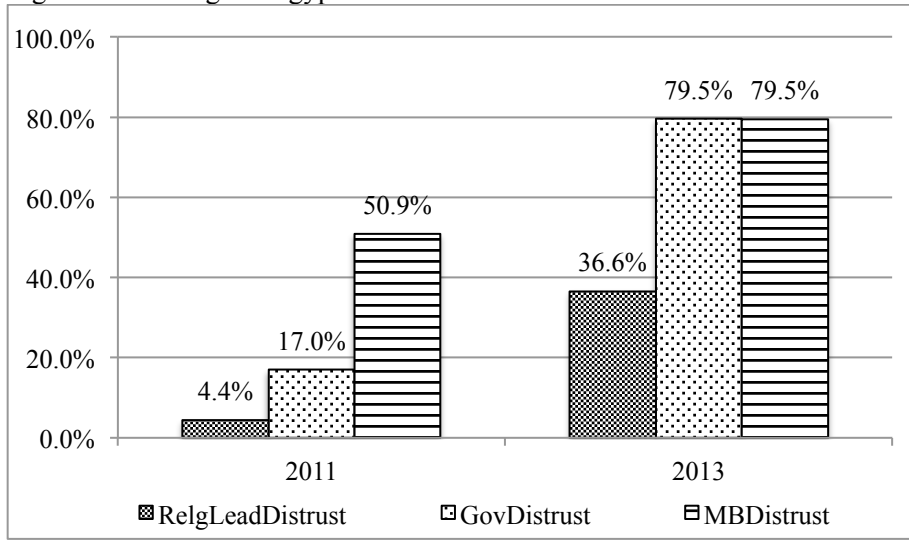
#### **4.5.2. Changes in Political and Economic Concerns**

It is possible that the changes in men's gender attitudes in the aftermath of the Revolution were associated with changes in their political and economic concerns. In particular, Egyptian men's increased disappointments in their male-dominated government and distrust in leadership during this time period may be correlated with their increased confidence in female political leadership. In 2011, 39.6 percent were satisfied in their government, 85.6 percent believed that there is corruption within the state's institutions and agencies, and 58.3 percent evaluated the government's performance in managing the process of democratic transition as very good or good. However, by 2013, these numbers significantly changed to 14.9 percent, 96.1 percent, and 11.7 percent, respectively ( $p$ -values = 0.000). Yet, as shown in the regression analysis in Appendix C, Table C.4, none of these measures of government performance are associated with men's confidence in female leadership ability.

Moreover, increased distrust in male-dominated political leadership (Figure 4.2) could also be associated with the change in attitudes towards women's leadership. In fact, in 2011, 83 percent of male respondents trusted the government (the cabinet) to a great or medium extent, whereas by 2013, there was nearly a complete reversal with 79.5 percent of men absolutely not trusting the government or trusting it to a limited extent ( $p$ -value = 0.000). Similarly, while 49.1 percent of men in 2011 trusted the Muslim Brotherhood to a great or medium extent, by 2013,

only 20.5 percent held the same level of trust towards them ( $p$ -value = 0.000). In addition, only 4.4 percent of Egyptian men believed that religious leaders are untrustworthy in 2011, but by 2013, the share of men who distrusted their religious leaders rose to 36.6 percent ( $p$ -value = 0.000).

Figure 4.2: Change in Egyptian men’s trust towards leaders from 2011 to 2013, Percent of Men



As shown in the regression analysis in Appendix C, Table C.5, coefficients on distrust in Muslim Brotherhood or the government variables are not significant and therefore, not associated with changes in men’s gender attitudes. However, the regression analysis in Table 4.5 confirms that increased reduced credibility of religious leaders (and possibly their messages) is significantly correlated with men’s confidence in women’s political leadership ability. In fact, in 2013, Egyptian men had one of the highest levels of distrust in religious leadership in the region, with the share of men with this perception increasing by 725 percent as compared to 2011.<sup>31</sup> Still, much of the association of the 2013-year dummy remains, suggesting that changes in other factors that occurred during this time period may also be associated with men updating their attitudes towards female leadership.

<sup>31</sup> Unfortunately, the question regarding trust in religious leaders was only asked in Egypt in the first wave of the survey, so it is not possible to conduct a thorough cross-country analysis of this variable (Appendix C, Table C.6).

Table 4.5: Probit Regression for Men’s Confidence in Women’s Political Leadership Ability, Marginal Effects at Means

	(1) All Men	(2) All Men
Year2013	0.226*** (0.022)	0.170*** (0.023)
Distrust in Religious Leaders		0.085*** (0.025)
Employed	0.005 (0.015)	0.003 (0.014)
Married	-0.021 (0.019)	-0.013 (0.017)
Tertiary Education	0.033 (0.026)	0.029 (0.024)
Secondary Education	0.012 (0.018)	0.010 (0.016)
Primary Education	0.032 (0.023)	0.034 (0.023)
Observations	1,174	1,160
Pseudo-R2	0.120	0.142

Notes: The table presents Probit regression results with marginal effects at means reported in percentage points with 2011 as the baseline comparison in all columns. The dependent variable is a binary variable that equals 1 if individuals disagree with men being better political leaders than women, and 0 otherwise. Leader distrust variables equal 1 if individuals believe that the leaders are trustworthy and 0, otherwise. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual, financial status of the household (1 if household has sufficient income to cover expenses, 0, otherwise), whether their home is owned vs. rented, and age are also controlled for. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

With regard to attitudes towards women joining the workforce, heightened concerns surrounding the economic situation in Egypt may be correlated with their increased support for women’s labor force participation. However, while only 22.5 percent of individuals surveyed in 2011 responded that their households had sufficient income to cover all their expenses, by 2013, 33.6 percent of individuals were from financially secure households ( $p$ -value = 0.000). Whereas, financial situations may have improved amongst those surveyed, economic worries may have worsened in the aftermath of the Revolution. Changes in individual perceptions of the current

economy and future economic prospects may be associated with men's attitudes towards women's employment.

In 2011, 32 percent of men believed that the current economic situation in Egypt is either very good or good, which was significantly higher than the mere seven percent of men who had the same view on the economy in 2013 ( $p$ -value = 0.000). Having a negative view on the status of the economy appears to be positively correlated with support for married women's employment, however, the association is not statistically significant in 2013 when considering all men ( $p$ -value = 0.115), men from financially struggling households ( $p$ -value = 0.111), and men from financially secure households ( $p$ -value = 0.321). As shown in the regression analysis in Appendix C, Table C.7, evaluations on the status of the economy are not significantly associated with attitudes towards married women's employment.

Another measure for individuals' economic concerns is their outlook for Egypt's economy. In 2011, 81.8 percent of all male respondents were hopeful about the economic situation improving in the next 3-5 years. The level of optimism significantly declined by 52 percentage points in 2013, with only 29.9 percent of individuals having an optimistic economic outlook ( $p$ -value = 0.000). While the level of support for married women's employment and having a pessimistic outlook on the economy appear to be positively correlated, the correlation was not statistically significant in 2013 when considering all men ( $p$ -value = 0.818). In 2011, men from households lacking financial security and those who were well off shared the same level of economic pessimism, with only 6.5 percent of men not having a positive economic outlook. This difference is not significant ( $p$ -value = 0.989) as shown in the regression analysis in Appendix C, Table C.7.

However, individuals from financially struggling households experienced a more significant increase in their economic pessimism at 64.6 percent as compared to 41.9 percent of individuals who were financially well off ( $p$ -value = 0.000). At the same time, amongst men from financially struggling households, support for married women's employment was 8.1 percentage points higher in 2013 if they were pessimistic about the economy as compared to those who were optimistic about the economy. This difference is marginally significant ( $p$ -value = 0.076). The regression analysis in Column (3) of Appendix C, Table C.7 confirms that for individuals from financially struggling households, having a pessimistic outlook on Egypt's economy was positively associated with accepting married women's employment.

Decreased credibility of religious leadership seems to again be significantly correlated with Egyptian men updating their beliefs about married women's employment, both amongst men from financially struggling and secure households. As shown in the regression analysis in Table 4.6, individuals who were distrustful of religious leaders were also significantly more likely to believe that it is acceptable for a married woman to work. Moreover, when this variable is included in the analysis for men from financially struggling households, contrary to expectations, economic outlook seems to no longer be associated with support for married women's employment (Appendix C, Table C.7, Column (4)). Therefore, men's attitude towards women entering the workforce seems to be highly correlated with negative attitudes towards religious leadership.

Table 4.6: Probit Regression for Support for Married Woman's Work, Marginal Effects at Mean

	(1)	(2)	(3)	(4)	(5)	(6)
	All Men	All Men	Financially Struggling Household	Financially Struggling Household	Financially Secure Households	Financially Secure Households
Year2013	0.201*** (0.026)	0.161*** (0.029)	0.221*** (0.032)	0.176*** (0.036)	0.156*** (0.049)	0.134** (0.054)
Distrust in Religious Leaders		0.180*** (0.037)		0.185*** (0.046)		0.149** (0.060)
Employed	0.010 (0.042)	0.013 (0.043)	0.054 (0.050)	0.053 (0.051)	-0.109 (0.069)	-0.104 (0.071)
Married	-0.075 (0.046)	-0.057 (0.047)	-0.097* (0.055)	-0.076 (0.056)	-0.041 (0.076)	-0.029 (0.078)
Tertiary Education	0.165*** (0.050)	0.158*** (0.051)	0.188*** (0.059)	0.175*** (0.061)	0.113 (0.106)	0.128 (0.109)
Secondary Education	0.038 (0.043)	0.029 (0.044)	0.055 (0.049)	0.041 (0.050)	0.005 (0.098)	0.017 (0.102)
Primary Education	0.037 (0.048)	0.041 (0.049)	0.037 (0.054)	0.04 (0.055)	0.024 (0.113)	0.029 (0.115)
Observations	1,193	1,178	860	849	333	329
Pseudo-R2	0.081	0.090	0.071	0.081	0.063	0.074

Notes: The table presents Probit regression results with marginal effects at means reported in percentage points with 2011 as the baseline comparison. The dependent variable is support for married women working outside of the home, which equals 1 if individual agrees that a married woman can work outside the home, and 0, otherwise. Distrust in religious leaders variable equals 1 if individuals believe that religious leaders are trustworthy and 0, otherwise. Both are evaluated at zero. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual and age are also controlled for. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

Finally, with regard to changes in men's attitudes towards girls' university education, it appears that this attitude change mainly occurred amongst men from financially struggling households. While in 2011, 58.2 percent of these men disagreed with the statement that university education is more important for boys than girls, by 2013, a significantly higher share of men from financially struggling households supported girls' university education, at 76 percent ( $p$ -value = 0.000). In contrast, men from financially secure households already demonstrated high levels of support for girls' university education in 2011, at 68.4 percent, and

experienced a statistically insignificant increase to 74.6 percent in 2013 ( $p$ -value = 0.2136). This is confirmed by the regression analysis in Appendix C, Table C.8, with an average man from a financially struggling household in 2013 being 19 percentage points more likely to support girls' university education, as compared to his counterpart in 2011. Consequently, the rest of the analysis will focus on men from households that do not have sufficient income to cover their expenses.<sup>32</sup>

It appears that reduced credibility of religious leaders and possibly their traditional messages is not correlated with men's attitudes towards girls' educational attainment. Having a negative view of religious leaders was not correlated with support for girls' university education, with 75.8 percent of individuals who trusted religious leaders in 2013 supporting girls' university education, which is not significantly different from the 76.4 percent who did not believe the religious leaders are trustworthy ( $p$ -value = 0.895). This could be due to the fact that education is considered as a mostly gender-neutral domain in Egypt, with women already achieving high levels of university education.

However, men's increased job market concerns are significantly associated with more positive attitudes towards girls' university education. When looking at individuals' perceptions of availability of suitable government jobs, as seen in Figure 4.3, only 9.8 percent of these men in 2011 were pessimistic about the government's performance and availability of suitable jobs, but that number significantly increased to 75.6 percent in 2013 ( $p$ -value = 0.000).<sup>33</sup> Moreover, in 2013, amongst men whose household income is insufficient to cover their expenses, those who

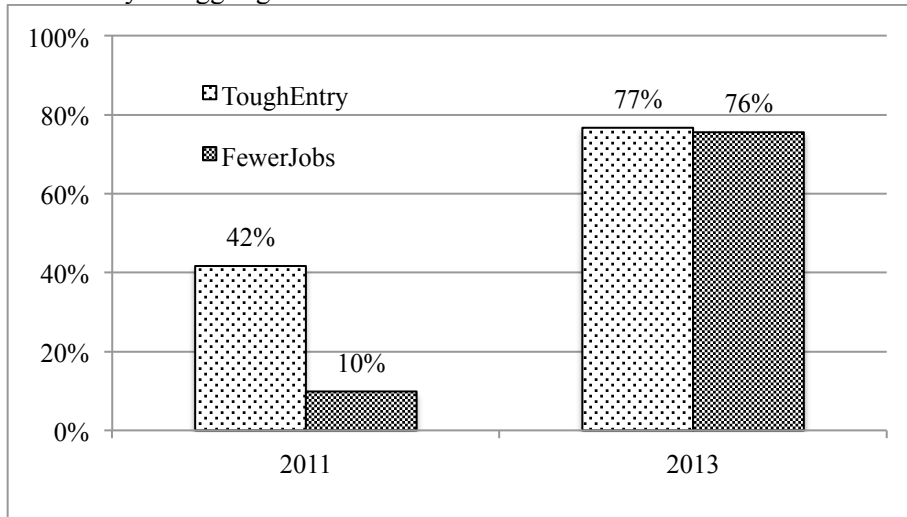
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<sup>32</sup> In fact, amongst men from financially struggling households, those in Egypt demonstrated the least amount of support for girls' university education in 2011 (Appendix C, Figure C.5.a) and yet, by 2013, they exhibited the greatest increase their support (Appendix C, Figure C.5.b).

<sup>33</sup> This increase was most significant for men with greater financial need, who experienced a 66 percentage point increase ( $p$ -value = 0.000) as compared to an 52 percentage point increase amongst men who were financially well off ( $p$ -value = 0.000).

poorly evaluated government's performance, 80.9 percent supported girls' university education, as compared to 60.6 percent of those who positively evaluated government's performance ( $p$ -value = 0.000).<sup>34</sup>

Figure 4.3: Change in Egyptian men's job market concerns from 2011 to 2013, Percent of Men from Financially Struggling Households



With regard to individuals' perceptions of job market entry challenges (Figure 4.3), 41.7 percent of men from financially struggling households believed that connections are important to find a job in 2011 and by 2013, 76.7 percent held this belief ( $p$ -value = 0.000). This increase was also most significant for men with greater financial need, who experienced a 35 percentage point increase ( $p$ -value = 0.000) as compared to an 18 percentage point increase amongst men who were financially well off ( $p$ -value = 0.001). Additionally, in 2013, men from households that were not financially secure were significantly more likely to support girls' university education if they believed that connections were important for finding employment than if they did not have this belief ( $p$ -value = 0.042).

<sup>34</sup> Amongst men whose household income is sufficient to cover their expenses, those who poorly evaluated government's performance in 2013, 77.5 percent supported girls' university education, as compared to 69.1 percent of those who positively evaluated government's performance ( $p$ -value = 0.199).



Table 4.7: Probit Regression of Support for Girls' University Education, Men with Financially Struggling Households, Marginal Effects at Means

	(1)	(2)	(3)	(4)
	Financially Struggling Households Only			
Year2013	0.190*** (0.032)	0.082* (0.047)	0.152*** (0.039)	0.065 (0.052)
FewerJobs		0.181*** (0.043)		0.147*** (0.051)
ToughEntry			0.126*** (0.039)	0.103** (0.041)
Employed	0.058 (0.049)	0.063 (0.051)	0.068 (0.053)	0.068 (0.053)
Married	-0.059 (0.055)	-0.059 (0.056)	-0.057 (0.059)	-0.056 (0.059)
Tertiary Education	0.019 (0.063)	0.024 (0.064)	0.048 (0.068)	0.047 (0.068)
Secondary Education	0.017 (0.050)	0.034 (0.051)	0.042 (0.054)	0.054 (0.054)
Primary Education	0.083 (0.054)	0.0963* (0.055)	0.109* (0.060)	0.118* (0.060)
Observations	844	840	755	751
Pseudo-R2	0.042	0.055	0.050	0.058

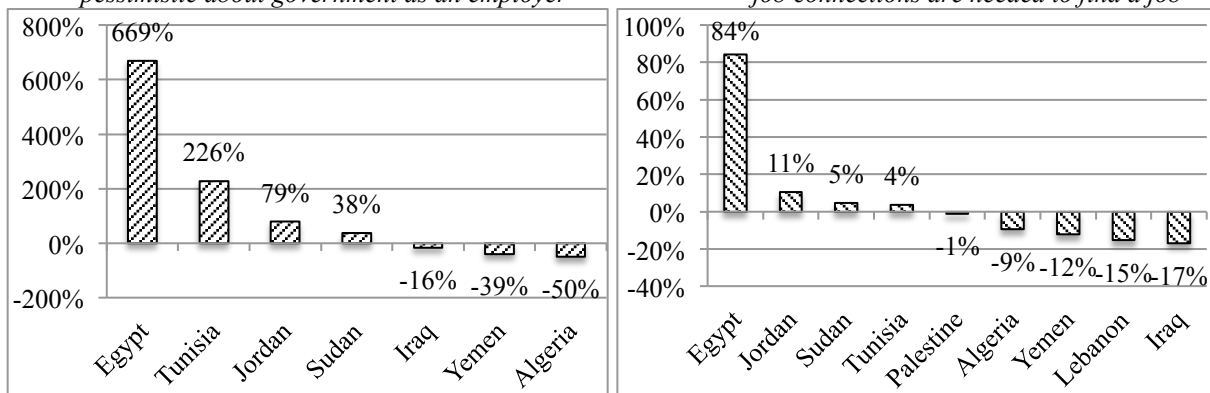
Notes: The table presents Probit regression results with marginal effects reported in percentage points with 2011 as the baseline comparison. The dependent variable is a binary variable that equals 1 if individual disagrees with university education being more important for a boy than a girl, and 0 otherwise. Tough entry variable is coded as 1 if individual believes that job connections are needed to find jobs, and 0, otherwise. Fewer jobs variable equals 1 if individual evaluated the government to be performing its tasks and duties poorly and 0 otherwise. Both are evaluated at 0. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual, and age are also controlled for. All three of these variables are evaluated at zero for a man with average age. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

As confirmed by the regression analysis in Table 4.7, Column (2), negatively evaluating government's performance (thus, being concerned about availability of suitable jobs for women) is significantly and positively correlated with supporting girls' university education for men with greater financial need. Additionally, as shown in Column (3) believing that connections are important to secure a job is also significantly and positively associated with supporting girls' university education amongst the same group of men. Combined, these job market variables are

both significantly correlated with support for girls' university education, though, the association with pessimistic perceptions regarding availability of suitable jobs is greater in magnitude and more statistically significant (Column (4)). In fact, introducing these variables reduces the magnitude of the coefficient on the 2013-year dummy variable and eliminates its statistical significance, suggesting that increased job market concerns are highly associated with support for girls' university education amongst men from financially struggling households.

In fact, when compared to other countries in the region during the same time period, Egypt experienced the greatest increase in the share of men who believed that job connections are needed to find employment (Figure 4.4.a), and that the government is performing poorly (Figure 4.4.b). Therefore, it seems that increased pessimism with regard to the government as an employer and ease of entering the labor force in the aftermath of the Revolution could have possibly played a role in encouraging men from financially struggling households to support girls' university education. This could be to either improve young women's chances to be competitive in the labor market or marriage market.

Figure 4.4: Change in men's income security concerns from 2011 to 2013, Share of Men  
 4.4 (a) Percent change in share of men who are pessimistic about government as an employer  
 4.4 (b) Percent change in share of men who believe job connections are needed to find a job



Therefore, men's increased support for women in a more gender-neutral domain (higher education) is not significantly associated with their attitudes towards religious leadership.

Rather, job market concerns for women, especially with regard to availability of suitable employment, seems to be highly correlated with men's support for girls' university education amongst individuals from financially struggling households. However, men's support for women in traditionally male domains (politics and labor market) seems to be highly associated with their trust in religious leaders. In particular, decreased credibility of religious leaders is significantly correlated with men's confidence in women's political leadership ability and support for women's employment. Much remains to be explained however. Perhaps Egyptian men have updated gender attitudes and perceptions of religious leaders as part of an overall shift in their worldviews in the aftermath of the Revolution. This will be further explored in the next section.

#### **4.5.3. Changes in Worldviews**

Following a Revolution that was filled with hope and optimism, the boisterous political shocks and failures of the post-Revolutionary religious regime could have driven individuals to reevaluate their perspectives and change their worldviews from a more traditional mindset, to a more "modern" one. Egyptian men's new outlooks could include different views on role of religion in politics, government leadership trust and credibility, government's performance, gender equality, democracy, political role of Islam, and different interpretations of Islamic tenets. In fact, compared with 2011, there appears to be greater support amongst men for a secular political system in 2013. While 59.8 percent of men believed that men of religion should not influence government decisions in 2011, by 2013, 69 percent held this belief ( $p$ -value = 0.001). Given that worldviews of individuals with secular and non-secular political orientations could shift differently in response to the failings of the Islamic government and leadership, changes in

Egyptian men's views on a range of issues were evaluated separately for secular and non-secular individuals.

Indeed, while trust in the government and leadership significantly declined for both, secular-oriented individuals appear to be more critical of the religious leadership (Table. 4.8). In 2013, the share of men who distrusted religious leaders was much higher for those who supported a secular regime, by 23 percentage points, as compared to men who supported a clerical influence in the government ( $p$ -value = 0.000). The same is true with respect to trust towards the Muslim Brotherhood, with the share of individuals who trusted this group and support a secular government being 19 percentage points lower than their non-secular counterparts in 2013 ( $p$ -value = 0.000).

Table 4.8: Trust in Leadership

	2011				2013			
	Secular	Non-Secular	Diff.	$p$ -value	Secular	Non-Secular	Diff.	$p$ -value
Trust the government (the cabinet) to a great or medium extent	81%	87%	0.06	0.087	19%	28%	0.09	0.039
Trust religious leaders to a great or medium extent	85%	94%	0.09	0.003	44%	67%	0.23	0.000
Trust the Muslim Brotherhood to a great or medium extent	45%	59%	0.14	0.002	17%	36%	0.19	0.000

Note:  $p$ -values represent two-sample t-test of means.

At the same time, both secular and non-secular individuals experienced the same level of increase in their perception of government corruption (Table 4.9), with no significant differences in 2011 ( $p$ -value = 0.544) or 2013 ( $p$ -value = 0.842). However, secular-oriented individuals appear to be more critical of the government's performance in 2013, especially with regard to managing the democratic process in Egypt ( $p$ -value = 0.014) and democratic values such as guaranteeing freedom of press ( $p$ -value = 0.000), freedom of speech ( $p$ -value = 0.007), and human rights ( $p$ -value = 0.016). Moreover, government satisfaction did not experience a

significant shift amongst those with non-secular regime preferences ( $p$ -value = 0.659), but the share of secular individuals who were satisfied with the government significantly declined from 44 percent by 32 percentage points to 12 percent ( $p$ -value = 0.000). This is also significantly lower than the 26 percent of non-secular individuals who were satisfied with the government in 2013 ( $p$ -value = 0.000).

Table 4.9: Government Evaluation

	2011				2013			
	Secular	Non-Secular	Diff.	$p$ -value	Secular	Non-Secular	Diff.	$p$ -value
Satisfied with the government (7-10, on scale of 1 to 10)	44%	29%	-0.16	0.000	12%	26%	0.14	0.004
Believes there is corruption within the state's institutions and agencies	86%	84%	-0.02	0.544	96%	96%	0.00	0.842
Evaluates the government's performance in managing the process of democratic transition process as Very good/good	60%	55%	-0.06	0.206	10%	20%	0.09	0.014
Freedom of the press is guaranteed to a great or medium extent	95%	96%	0.01	0.442	67%	86%	0.19	0.000
Freedom of express opinions is guaranteed to a great or medium extent	94%	98%	0.04	0.036	67%	81%	0.14	0.007
The state of democracy and human rights in Egypt is Very good/good	60%	74%	0.13	0.001	14%	24%	0.10	0.016

Note:  $p$ -values represent two-sample t-test of means.

However, both secular and non-secular politically oriented men significantly increased their support for gender equality during this time period (Table 4.10). While men with secular political views initially had higher levels of support for women's employment in 2011, by 2013, both individuals with secular and non-secular political perspectives demonstrated similar levels of support at around 80 percent ( $p$ -value = 0.643). In fact, men who believed in clerical influence over government decisions experienced a 33-percentage point increase in their support for women's work ( $p$ -value = 0.000), as compared to a 15-percentage points increase amongst

secular individuals ( $p$ -value = 0.000). Moreover, while only seven percent of men in both groups had confidence in female political leadership in 2011 ( $p$ -value = 0.970), men who supported clerical government influence had a slight advantage in increasing their faith in female politicians over men who backed having a secular government in 2013 ( $p$ -value = 0.108). On the other hand, this was reversed with respect to men's support for girls' university education ( $p$ -value = 0.092).

Table 4.10: Support for Gender Equality

	2011				2013			
	Secular	Non-Secular	Diff.	$p$ -value	Secular	Non-Secular	Diff.	$p$ -value
Strongly Disagree/disagree that in general, men are better at political leadership than women.	7%	7%	0.00	0.970	22%	30%	-0.08	0.108
Strongly Agree/Agree that a married woman can work outside the home.	66%	46%	0.20	0.000	81%	79%	0.02	0.643
Strongly Disagree/Disagree university education for males is more important than for females.	61%	58%	0.03	0.504	77%	69%	0.08	0.092

Note:  $p$ -values represent two-sample  $t$ -test of means.

Support for gender equality is often argued to be a democratic value and associated with higher levels of support for democracy (Jamal & Tessler, 2008). However, there appear to be no significant changes in support for democracy in Egypt with 85.9 percent and 83.8 percent of all men supporting democracy in 2011 and 2013, respectively ( $p$ -value = 0.319). Similar to the analysis by Jamal and Tessler (2008) when looking at other Arab countries, in Egypt, respondents who supported democracy were almost equally divided between those who favor a secular democracy and those who favor a democratic political system where Islam plays an important role both in 2011 and in 2013 (Table 4.11). While support for democracy remained high in 2013, both groups almost equally believed that democracy is inappropriate in Egypt ( $p$ -value = 0.776), which is a significant decline from 2011.

Table 4.11: Support for Democracy

	2011				2013			
	Secular	Non-Secular	Diff.	<i>p</i> -value	Secular	Non-Secular	Diff.	<i>p</i> -value
Strongly Agree/Agree that a democratic system may have problems, yet it is better than other systems.	87%	84%	0.03	0.299	85%	83%	0.02	0.663
Democracy is completely appropriate for Egypt (8, 9, 10, on scale of 1 to 10)	49%	36%	0.13	0.004	15%	16%	-0.01	0.776

Note: *p*-values represent two-sample t-test of means.

At the same time, support for political role of Islam remains high amongst all Egyptian men (Table 4.12). In fact, in 2013, 90 percent of respondents who supported a secular political system and 94 percent of those who supported clerical influence in politics believed that it is either very important or important for Egypt's New Constitution to assure that Islamic law (Shari'a) is the main source of legislation (*p*-value = 0.231). There was also a significant increase in the share of secular men who disagreed with the statement that religion is a private matter and should be separated from sociopolitical life (*p*-value = 0.000). In addition, there were no significant changes in men's attitudes towards government's legal system, with a significant majority believing that it should only implement laws in accordance with Islamic law (*p*-value = 0.436 for "secular" respondents, *p*-value = 0.916 for "non-secular" respondents).

Table 4.12: Support for Political Role of Islam

	2011				2013			
	Secular	Non-Secular	Diff.	<i>p</i> -value	Secular	Non-Secular	Diff.	<i>p</i> -value
It is Very important/important for the New Constitution to assure that Islamic law is the main source of legislation	N.A.	N.A.	N.A.	N.A.	90%	94%	-0.04	0.231
Strongly Agree/Agree that religious practice is a private matter and should be separated from sociopolitical life	88%	71%	0.18	0.000	79%	68%	0.11	0.019

Table 4.12 (Continued)

Strongly Agree/Agree that Government Should implement only laws in accordance with Islamic law (Shari'a).	70%	87%	-0.17	0.000	72%	87%	-0.15	0.002
Strongly Agree/Agree that the government should enact personal status laws (marriage, divorce) in accordance with Islamic law.	86%	96%	-0.10	0.000	90%	93%	-0.03	0.393
Strongly Agree/Agree that the government and parliament should enact inheritance laws in accordance with Islamic law.	92%	97%	-0.05	0.010	91%	92%	-0.01	0.680

Note: *p*-values represent two-sample t-test of means.

What is also striking is that there appears to be a convergence towards support for personal status laws of marriage and divorce to be in accordance with Islamic law, which generally do not favor women (Mayer, 2006; Tessler, 2015). In 2013, 90 percent of individuals who supported a secular government and 93 percent of individuals who supported clerical influence in the government either strongly agreed or agreed that the government should enact personal status laws in accordance with Islamic law (*p*-value = 0.393), as compared to 86 percent and 96 percent in 2011, respectively (*p*-value = 0.000). In addition, support for the government enacting inheritance laws in accordance with Islamic law were also very high at around 91 percent in 2013, with individuals who supported men of religion to influence the government experiencing a decline in their support as compared to 2011 (*p*-value = 0.033). These insights combined with the fact that men also increased their support for gender equality during the same time period, lend support to the idea that men may have updated their gender attitudes in order to allow for more favorable treatment of women *within* Islam. This is also consistent with the



findings of Clingingsmith et al. (2009), who found that Pakistani Hajjis altered gender attitudes reflect a trend against local prejudices that hinder women's fair treatment within Islam.

In fact, personal religiosity remains high across these two years (Appendix C, Table C.9). While there is an increased gap in religious identification between those who supported a secular government and those who favored a government with clerical influence in 2013 ( $p$ -value = 0.000), measures of religious practice (frequency of Qur'an reading, prayer and religious service attendance) are somewhat similar, and overall, very high. What is more distinct between secular and non-secular individuals are their differences in religious interpretations (Table 4.13). In particular, in 2013, majority of Egyptian men believed that Shari'a is the word of God and not the human interpretation of the word of God, and there were no significant differences amongst those who supported a secular regime and those who favored clerical influence in government ( $p$ -value = 0.520). As also argued by Tessler (2015), this could explain why despite differences in political orientations, support for implementation of Shari'a law is very high in the Middle East (Table 4.12).

Table 4.13: Islamic Interpretation Views

	2011				2013			
	Secular	Non-Secular	Diff.	$p$ -value	Secular	Non-Secular	Diff.	$p$ -value
Shari'a is human interpretation of the word of God (vs. the word of God)	N.A.	N.A.	N.A.	N.A.	19%	16%	0.03	0.520
Strongly Agree/Agree that banks interest fees contradict the teachings of Islam.	68%	68%	0.00	0.923	68%	82%	-0.14	0.007
Strongly Agree/Agree that Democracy is a system that incompatible with the teachings of Islam.	10%	12%	-0.02	0.367	7%	16%	-0.08	0.008
Strongly Agree/Agree that gender-mixed education should be allowed in universities.	72%	62%	0.10	0.016	65%	36%	0.29	0.000

Table 4.13 (Continued)

Strongly Agree/Agree that women should wear modest clothes without needing to wear hijab.	61%	71%	-0.10	0.018	62%	46%	0.16	0.004
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Note: *p*-values represent two-sample t-test of means.

However, by 2013, there was significant divergence in interpretations of Islamic principles between the two groups. In particular, men who supported religious men’s influence in government were significantly more likely to agree that charging interest contradicts the teachings of Islam (*p*-value = 0.007), democracy is a system that is incompatible with the teachings of Islam (*p*-value = 0.008), gender-mixed education should not be allowed in universities (*p*-value = 0.000), and that *hijab*<sup>35</sup> is required for women even if they wear modest clothing (*p*-value = 0.004). In addition, men who favor a secular government were also more likely to disagree with allowing mix-gender education in universities in 2013 than in 2011 (*p*-value = 0.021).

Combined, all of these insights suggest that changes in men’s gender attitudes between 2011 and 2013 may be reflecting their desires for improved treatment of women within Islam, especially amongst men who support a government with clerical influence. This could be as a result of significant media coverage of Egyptian women’s strong and continuous political involvement, and the increased dialogue about the extreme mistreatment of women after the Revolution.

The next section discusses these results and concludes.

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<sup>35</sup> *Hijab* is a head covering worn by women as part of their Islamic dress code.

#### 4.6. Conclusion

Garnering men's support and cooperation is a key requirement for achieving gender equality. In fact, research has shown that attempting to even gently nudge men towards making more gender diverse decisions without shifts in their internalized gender attitudes could lead to backlash against women (Paryavi et al., 2016). However, while the role and origins of gender attitudes have received much attention in recent years, little progress has been made in understanding *changes* in men's attitudes towards women's role in society, especially in the Middle East and North African context. By studying shifts in men's gender attitudes in the aftermath of the 2011 Egyptian Revolution, this research has generated some important insights.

The results revealed that, all else equal, the political crisis in Egypt was highly correlated with men adopting more egalitarian gender attitudes. Egyptian men in the midst of the crisis were significantly more likely to have confidence in women's political leadership abilities, accept married women's employment and support girls' university education as opposed to their counterparts right after the Revolution. They also experienced the most significant positive changes in these gender attitudes than other Arab men in the region.

Further analysis reveals that support for girls' university education (i.e. a mostly gender-neutral domain in Egypt) significantly increased only amongst men from financially struggling households and was highly associated with their amplified concerns regarding the availability of suitable employment for women. In contrast, men's greater confidence in women's political leadership and support for women's workforce entry (i.e. both traditionally male domains) was not associated with their increased political or economic grievances, but with the decreased credibility of religious leaders.

At the same time, men's updated gender attitudes do not appear to be part of broader changes in their worldviews towards a more "modern" and "secular" outlook as a result of the

failures of the post-Revolutionary religious government. While a greater share of men supported a political system that is not influenced by religious leaders, both individuals with secular and non-secular political orientations significantly increased their backing of egalitarian gender attitudes. In addition, support for political role of Islam and for personal status laws of marriage and divorce to be in accordance with Islamic law remained high amongst both secular and non-secular individuals, with non-secular men gravitating towards more conservative interpretations of Islam.

These insights combined with the fact that both secular and non-secular men increased their backing for gender equality in the turbulent aftermath of the Egyptian Revolution, conforms to the idea that men may have updated their gender attitudes in order to allow for more favorable treatment of women within Egypt's Islamic cultural context. These changes in gender attitudes could be driven from the reduced credibility of religious leaders and their traditional messages, which promoted extreme masculine patriarchal ideologies that sought to limit women's involvement in the public sphere. Furthermore, the significant media coverage of many Arab women's unrelenting political involvement and the increased dialogue about the extreme marginalization and mistreatment of Egyptian women after the Revolution could have also encouraged men to update their attitudes towards women's participation in politics and the labor force.

These findings have important implications for gender equality policy design in the region. The results suggest that for interventions to be effective in garnering men's support in the cultural context of MENA, it would be important for them to make a case for women's empowerment that is in line with the teachings and understandings of Islam. This is especially important with regard to women's greater participation in traditionally male domains such as

politics and the labor force. With respect to increasing support for girls' university education amongst men from financially struggling households, emphasis needs to be made on the importance of university education in improving girls' chance of competitiveness and achieving financial security in the future.

Given men's influence in Egyptian society as in elsewhere in MENA, the observed changes in their gender attitudes in the aftermath of the Egyptian Revolution, in time, could lead to shifts in behaviors and social norms, which could improve women's status in the household and their access to opportunities in the public sphere. In fact, during the 2015 parliamentary elections, 75 women were elected, which was a record for Egypt and a significant increase from the 10 women who were elected 2012 (Inter-Parliamentary Union, 2016). Time and future research will have to tell whether the changes in men's gender attitudes in the aftermath of the Revolution will translate into more consistent efforts to encourage women's greater participation in the public sphere, leading to lasting changes in behaviors, norms and the status of women in Egypt.

#### 4.7. References

- Abdel Gawad Soltan, G., Nagui Qamha, A., & 'Asilah, S. (2011). The Arab Barometer Project: Arab Republic of Egypt Country Report: Al-Ahram Center for Political and Strategic Studies.
- Al Aswany, A. (December 8, 2013). Egypt's Trouble With Women. *Opinion Pages*. Retrieved May 30, 2016, from [http://www.nytimes.com/2013/12/09/opinion/09iht-edaldaswany09.html?\\_r=0](http://www.nytimes.com/2013/12/09/opinion/09iht-edaldaswany09.html?_r=0)
- Al-Shamahi, A. (October 9, 2011). Tawakkol Karman: Nobel Peace Prize laureate. Retrieved May 30, 2016
- Alesina, A., Giuliano, P., & Nunn, N. (2013). On the Origins of Gender Roles: Women and the Plough. *The Quarterly Journal of Economics*, 128(2), 469-530.
- AlJazeera. (2011). Egyptians protest against beating of women. Retrieved May 30, 2016, from <http://www.aljazeera.com/news/middleeast/2011/12/20111220132113595450.html>
- Ansani, A., & Daniele, V. (2012). About a Revolution: The Economic Motivations of the Arab Spring. *International Journal of Development and Conflict*, 2(3).
- Assaad, R. (2010). Equality for all: Egypt's free higher education policy breeds inequality of opportunity *Policy Perspective No. 2: Economic Research Forum*, Cairo.
- Bachelet, M. (2012). Women's Empowerment in the Middle East and Worldwide. Retrieved May 20, 2015, 2016, from <http://www.unwomen.org/en/news/stories/2012/4/women-s-empowerment-in-the-middle-east-and-worldwide>
- Barsoum, G. (2014). Young People's Job Aspirations in Egypt and the Continued Preference for a Government Job *Working Paper* (Vol. No. 838): Economic Research Forum.
- Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R., & Topalova, P. (2009). Powerful Women: Does Exposure Reduce Bias? *The Quarterly Journal of Economics*, 142(4), 1497-1540.
- Beath, A., Christia, F., & Enikolopov, R. (2013). Empowering Women through Development Aid: Evidence from a Field Experiment in Afghanistan. *American Political Science Review*, 107(3), 540-557.

- Bertrand, M., Kamenica, E., & Pan, J. (2015). Gender Identity and Relative Income Within Households. *The Quarterly Journal of Economics*, 571–614.
- Blair, E., Taylor, P., & Perry, T. (2013). Special Report: How the Muslim Brotherhood lost Egypt. Retrieved May 30, 2016, from <http://www.reuters.com/article/us-egypt-mistakes-specialreport-idUSBRE96O07H20130726>
- Bohnet, I. (2016). *What Works: Gender Equality by Design*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.
- Chick, K. (2011). In Egypt's Tahrir Square, Women Attacked at Rally on International Women's Day. *Christian Science Monitor*. Retrieved May 30, 2016, from <http://www.csmonitor.com/World/Middle-East/2011/0308/In-Egypt-s-Tahrir-Square-women-attacked-at-rally-on-International-Women-s-Day>
- Childress, S. (2013). Timeline: What's Happened Since Egypt's Revolution? Retrieved September 15, 2015, 2015, from <http://www.pbs.org/wgbh/pages/frontline/foreign-affairs-defense/egypt-in-crisis/timeline-whats-happened-since-egypts-revolution/>
- Cleaver, F. (Ed.). (2003). *Masculinities Matter! Men, Gender and Development*. London: Zed Books.
- Clingingsmith, D., Khwaja, A. I., & Kremer, M. R. (2009). Estimating the Impact of the Hajj: Religion and Tolerance in Islam's Global Gathering. *The Quarterly Journal of Economics*, 124(3), 1133-1170.
- Coleman, I. (2012). Why the Arab Spring Hasn't Been Better for Women. Retrieved May 30, 2016, from <http://www.theatlantic.com/international/archive/2012/03/why-the-arab-spring-hasnt-been-better-for-women/254150/>
- Dancer, D. M., & Rammohan, A. (2007). The Determinants of Schooling in Egypt: The Role of Gender and Rural-Urban Residence. *Oxford Development Studies*, 35(2), 171-195.
- Duflo, E. (2011). Women's Empowerment and Economic Development *Working Paper 17702*: National Bureau of Economic Research.
- Duflo, E., & Topalova, P. (2004). Unappreciated Service: Performance, Perceptions and Women Leaders in India *Working Paper*: MIT.

- Fortin, N. M. (2005). Gender Role Attitudes and the Labour-Market Outcomes of Women Across OECD Countries. *Oxford Review of Economic Policy*, 21(3), 416-438.
- Hendy, R. (2015). Untapping Low Female Labor Force Participation In Egypt: Ending The Marriage Mismatch *Policy Brief No. 5*: Economic Research Forum.
- Higgins, M. (December 20, 2011). Police beating of ‘girl in the blue bra’ becomes new rallying call for Egyptians. Retrieved May 30, 2016, from <http://news.nationalpost.com/news/beatng-of-blue-bra-woman-reignites-egyptian-protests>
- Inglehart, R., & Norris, P. (2003). *Rising Tide: Gender Equality and Cultural Change around the World*. New York: Cambridge University Press.
- Inter-Parliamentary Union. (2016). *Women in national parliaments, as of January 1, 2016*.
- Iversen, T., & Rosenbluth, F. (2010). *Women, Work, and Politics: The Political Economy of Gender Inequality*. New Haven & London: Yale University Press.
- Jamal, A., & Tessler, M. (2008). The Democracy Barometers: Attitudes in the Arab World. *Journal of Democracy*, 19(1).
- Jamal, A., Tessler, M., Shikaki, K., Almasri, M., Robbins, M., al-Jabi, A., . . . al-Salahi, F. (2014). *Arab Barometer: Public Opinion Survey Conducted in Algeria, Egypt, Iraq, Jordan, Lebanon, Palestine, Saudi Arabia, Sudan, Tunisia, and Yemen, 2010-2011*.
- Jensen, R., & Oster, E. (2009). The Power of TV: Cable Television and Women's Status in India. *The Quarterly Journal of Economics*, 124(3), 1057-1094.
- Mayer, A. (2006). *Islam and Human Rights: Tradition and Politics*. Boulder, CO: Westview Press.
- Mekay, E. (2011). Arab women lead the charge for political change. Retrieved May 30, 2016, from <https://electronicintifada.net/content/arab-women-lead-charge-political-change/9807>
- Naber, N. (2011). Women and the Arab Spring: Human Rights from the Ground Up. *International Institute Journal, University of Michigan*, 1(1).



- Norris, P. (2009). Why do Arab States Lag the World in Gender Equality? *HKS Faculty Research Working Paper Series*. John F. Kennedy School of Government, Harvard University.
- Norris, P., & Inglehart, R. (2004). *Sacred and Secular: Religion and Politics Worldwide*. Cambridge University Press.
- Paryavi, M., Bohnet, I., & van Geen, A. (2016). *Descriptive Norms and Gender Diversity: Reactance from Men*. (PhD Dissertation), Harvard University, Graduate School of Arts and Sciences.
- Pierotti, R., Alibhai, S., Buehren, N., & Campos, F. (2016). *Barriers for female entrepreneurs' access to finance: a qualitative assessment in Ethiopia*.
- QuotaProject. (2014). Global Database of Quotas for Women. Retrieved May 25, 2016, from <http://www.quotaproject.org/uid/countryview.cfm?CountryCode=EG>
- Rizk, R., & Abou-Ali, H. (2016) *Working Paper* (Vol. No. 996): Economic Research Forum.
- Ross, M. L. (2008). Oil, Islam, and Women. *American Political Science Review*, 102(01).
- Salehi-Isfahani, D. (2013). Rethinking Human Development in the Middle East and North Africa: The Missing Dimensions. *Journal of Human Development and Capabilities*, 14(3), 341-370.
- Tessler, M. (2015). *Islam and Politics in the Middle East: Explaining the Views of Ordinary Citizens*: Indiana University Press.
- Tessler, M., Jamal, A., Shteivi, M., Shikaki, K., Robbins, M., Hamami, R., . . . Salaam, T. (2015). *Arab Barometer: Public Opinion Survey Conducted in Algeria, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestine, Sudan, Tunisia, and Yemen, 2012-2014*.
- The Nobel Foundation. (2011). The Nobel Peace Prize 2011. Retrieved May 30, 2016, from [https://http://www.nobelprize.org/nobel\\_prizes/peace/laureates/2011/](https://http://www.nobelprize.org/nobel_prizes/peace/laureates/2011/)
- World Bank. (2004). Gender and Development in the Middle East and North Africa: Women in the Public Sphere *MENA Development Report*. Washington D.C.

World Bank. (2006). *The Other Half of Gender: Men's Issues in Development* (I. Bannon & M. C. Correia Eds.). Washington DC.

World Bank. (2013). *Opening Doors: Gender Equality and Development in the Middle East and North Africa MENA Development Report*. Washington, D.C.

World Development Indicators. (2015). *World Development Indicators*.

Zaller, J. R. (1992). *The Nature and Origins of Mass Opinion*: Cambridge University Press.

Zayed, D. (December 21, 2011). Attack on Egyptian women protesters spark uproar. Retrieved May 30, 2016, from <http://www.reuters.com/article/us-egypt-protests-women-idUSTRE7BK1BX20111221>

## Appendix A: Chapter 2 Experimental Instructions

Treatment Codes	
Treatments	Code
Self-Representation Condition	SR
Other-Representation Treatment	OR

<<*Italics are notes to the reader/ experimenter*>>

<<**Bold is treatment specific**>>

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

### Welcome!

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

You will remain anonymous throughout this study and there will be no way for the experimenter to relate your answers to your name. You will only be identified by the number that is on the post-it in your cubicle.

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

Please remain seated during the experiment until the experimenter tells you that it is ok to leave.

### How you will be paid:

<<**SR**>>

You are participating in a study in which you will earn some money.

The amount will depend on the decisions you make. At the end of the study, your earnings will be added to your \$5 show-up fee, and \$7 completion fee (for answering all questions) and you will be paid in cash.

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

<<**OR**>>

Those of you sitting in cubicles with yellow sticky notes will be asked to participate in a task in which you can earn money. The amount will depend on the decisions you make. At the end of the study, your earnings will be added to your \$5 show-up fee, and \$7 completion fee (for answering all questions) and you will be paid in cash. Your payoffs from the task will also

determine the payoffs of one other participant sitting in cubicles across from you with green sticky notes.

Those of you sitting in cubicles with green sticky notes will be asked to follow along on the screen, but do not need to perform any of the tasks. Your earnings will be determined by the payoffs of a randomly assigned participant sitting in a cubicle with a yellow sticky note. At the end of the study, their earnings from the task will be added to your \$5 show-up fee, and \$7 completion fee (for answering all questions) and you will be paid in cash.

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

### **TASK INSTRUCTIONS**

**<<OR>>**

Individuals with green sticky notes please just follow along on the screen.  
Yellow-labeled participants,

**<<SR, OR>>**

You will be asked to ADD up rows of 5 randomly drawn 2-digit numbers and fill the sum in a blank box at the end of the row. You are not allowed to use a calculator, but you may use the scratch paper provided on your desk.

Once you submit an answer on the computer, a new problem appears jointly with information on whether the former answer was correct. A record of the number of correct and wrong answers is kept on the screen.

You will have five minutes to solve as many problems as you can. Your final score is determined by the number of correctly solved problems.

### **How you will be paid:**

**<<SR>>**

You will be asked to complete four tasks and one of these tasks will be randomly chosen for your payment at the end of the experiment.

Your earnings from the chosen task will be added to the \$5 show-up fee and \$7 completion fee to determine your final payoffs.

If there are no questions, we will no proceed with the first task.

**<<OR>>**

You will be asked to complete four tasks and one of these tasks will be randomly chosen for your payment and the payment of a participant in a green-labeled cubicle at the end of the experiment.

Your earnings from the chosen task will be added to the \$5 show-up fee and \$7 completion fee to determine yours and a randomly assigned green-labeled participant's final payoffs.

If there are no questions, we will no proceed with the first task.

### **Task 1: Piece-rate Task**

<<**SR**>>

You will have five minutes to solve as many problems as you can. Your final score is determined by the number of correctly added row of numbers.

You will receive \$0.50 for each correct answer.

<<**OR**>>

Yellow-labeled participants, you will have five minutes to solve as many problems as you can. Your final score is determined by the number of correctly added row of numbers.

You and a green-labeled participant will receive \$0.50 per correct answer.

If there are no questions, please press OK to continue and start the task.

<<*Start clock for five minutes*>>

Time is now over. Please enter the number 0 and press SUBMIT to continue.

### **Task 2: Tournament**

<<**SR**>>

You are now in a group of 4 people, which includes yourself and the three people sitting next to you in your row of cubicles (to your right and left).

Your earnings depend on how you perform relative to the other 3 people in your group.

If you have the most correct answers you receive \$2 for each correct answer.

Otherwise you receive \$0.

In case of a tie, the winner is determined randomly.

<<**OR**>>

Yellow-labeled participants, you are now in a group of 4 people, which includes yourself and the three people sitting next to you in your row of cubicles (to your right and left).

Your earnings depend on how you perform relative to the other 3 people in your group.

If you have the most correct answers you and a green-labeled participant receive \$2 for each correct answer.

Otherwise you and a green-labeled participant receive \$0.

In case of a tie, the winner is determined randomly.

If there are no questions, please press OK to continue and start the task.

<<*Start clock for five minutes*>>

Time is now over. Please enter the number 0 and press SUBMIT to continue.

### **Task 3: CHOICE**

<<**SR**>>

You can now choose whether to enter a tournament or a piece rate.

**If you choose the piece rate:**

You will receive \$0.5 for every correct answer.

**If you choose the tournament:**

You win, if your score in this task is higher than the scores of the other three group members in the Task 2 tournament, which was just completed.

When you win, you receive 4 times the payment from the piece rate.

That is, you receive \$2 for each correct answer.

If you do not win, you receive \$0.

In case of a tie, the winner is determined randomly.

Please make your choice and please press OK to continue and start the task.

<<**OR**>>

Yellow-labeled participants, you can now choose whether to enter a tournament or a piece rate.

**If you choose the piece rate:**

You and a green-labeled participant will receive \$0.5 for every correct answer.

**If you choose the tournament:**

You win, if your score in this task is higher than the scores of the other three group members in the Task 2 tournament, which was just completed.

When you win, you and a green-labeled participant receive 4 times the payment from the piece rate.

That is, you and a green-labeled participant receive \$2 for each correct answer.

If you do not win, you and a green-labeled participant receive \$0.

In case of a tie, the winner is determined randomly.

Please make your choice and please press OK to continue and start the task.

<<*Start clock for five minutes*>>

Time is now over. Please enter the number 0 and press SUBMIT to continue.

### **Task 4: Submit TASK1 Piece Rate**

<<**SR**>>

You do not need to perform a five-minute math task here.

You choose whether to submit the TASK-1 Piece Rate performance to be paid by either a piece rate or a tournament.

**If you choose the piece rate:**

You will receive \$0.5 for every correct answer.

**If you choose the tournament:**

You win, if your score in this task is higher than the scores of the other three group members in the Task 2 tournament, which was just completed.

When you win, you receive 4 times the payment from the piece rate.

That is, you receive \$2 for each correct answer.

If you do not win, you receive \$0.

In case of a tie, the winner is determined randomly.

Please make your choice and please press OK to continue.

<<**OR**>>

Yellow-labeled participants, you do not need to perform a five-minute math task here.

You choose whether to submit the TASK-1 Piece Rate performance to be paid by either a piece rate or a tournament.

**If you choose the piece rate:**

You and a green-labeled participant will receive \$0.5 for every correct answer.

**If you choose the tournament:**

You win, if your score in this task is higher than the scores of the other three group members in the Task 2 tournament, which was just completed.

When you win, you and a green-labeled participant receive 4 times the payment from the piece rate.

That is, you and a green-labeled participant receive \$2 for each correct answer.

If you do not win, you and a green-labeled participant receive \$0.

In case of a tie, the winner is determined randomly.

Please make your choice and please press OK to continue.

**Rankings:**

<<**SR**>>

Now, you are asked to rank your performance as compared to the other three participants for the first three tasks. You receive \$1 for each correct ranking.

In the TASK-1 piece rate, how do you think you ranked in your performance as compared to the other three participants in your group?

If you guess correctly, you receive \$1.

In the TASK-2 tournament, how do you think you ranked in your performance as compared to the other three participants in your group?

If you guess correctly, you receive \$1.

In the TASK-3 choice, how do you think you ranked in your performance as compared to the other three participants in your group in the task-2 tournament?

If you guess correctly, you receive \$1.

<<**OR**>>

Yellow-labeled participants, now, you are asked to rank your performance as compared to the other three participants for the first three tasks. You and a green-labeled participant receive \$1 for each correct ranking.

Yellow-labeled participants, in the TASK-1 piece rate, how do you think you ranked in your performance as compared to the other three participants in your group?  
If you guess correctly, you and a green-labeled participant receive \$1.

Yellow-labeled participants, in the TASK-2 tournament, how do you think you ranked in your performance as compared to the other three participants in your group?  
If you guess correctly, you and a green-labeled participant receive \$1.

Yellow-labeled participants, in the TASK-3 choice, how do you think you ranked in your performance as compared to the other three participants in your group in the task-2 tournament?  
If you guess correctly, you and a green-labeled participant receive \$1.

<<Next Screen>>

<<Enter random number between 1-4 to determine which task will be selected for payment<sup>36</sup>>>

<<Payoffs Displayed>>

While we prepare your payment envelopes, please take your time filling out the brief questionnaire.

<<QUESTIONNAIRE>>

1. Gender (male/female)
2. Age ()
3. Nationality (North-American/South-American/European or Australian or Russian/African/Asian/Middle Eastern)
4. When did you move to the US? (Born in the US/Moved in age less than 5/Age 5-10/Age 11-15/Age 16-20/After age 20)
5. Race (Asian/American Indian/Alaska Native/Black/Native Hawaiian/White/Other)
6. School (Harvard/ MIT/Other/Not a student)
7. Current Program (College/Masters/PhD/other/N.A.)
8. Field of study (Social science/Economics /Science /Humanities/Arts/N.A.)
9. GPA at college ()
10. SAT scores (Writing/Mathematics/Critical Reading)
11. What do you expect *your* annual household income in 10 years to be?
12. Mother's education (High school/Some college/College/Graduate school/PhD/N.A.)
13. Father's education (High school/Some college/College/Graduate school/PhD/N.A.)
14. On a scale from 1 to 6, where 1 is not risk averse and 6 is extremely risk averse, how risk averse do you consider yourself?
15. On a scale from 1 to 6, where 1 is not loss averse and 6 is extremely loss averse, how loss averse do you consider yourself?

---

<sup>36</sup> Determined using Excel's "RANDBETWEEN(1,4)" function prior to the start of each session.



16. Describe your current emotional state (e.g. happy/ unsatisfied/ angry/ normal/ sad/ upset/ bored/ tired/ stressed/ energetic/ excited).
17. Any feedback or comments?

<<*Final Screen*>>

Please fill out the payment receipt provided and remain seated until the experimenter comes by with your payment envelope.

Thank you for your participation!

## Appendix B: Chapter 3 Experimental Instructions

### B.1 Stage 1 Instructions, For Stage 1 Employers

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

<<*Italics are notes to the reader/ experimenter*>>

<<**Bold is treatment specific**>>

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

WELCOME!

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

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

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

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

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

**Your Choice.** --

Another group of study participants has participated in a study conducted by us earlier at Harvard Decision Science Lab (HDSL). They have been paid based on their performance. They had to solve as many problems as they could in a given time period, and this task was performed

at least three times. We will explain the task to you below. Then, you will receive two of three performance scores for 20 of these participants. Finally you will be asked to select 5 of the 20 participants, where the third score on the task of your selected five candidates will determine your earnings.

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

**Information on Task.**

<<MI, M2 or V1, V2>>

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

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

Their point score was calculated as follows:

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

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

*(SAMPLE TASK)*

Remaining time: 0  
Please hit the OK button NOW

Round 1  
Please make sure to STOP solving and hit the OK button when the time limit is up.

					Total						Total
20	30	11	40	73	<input type="text"/>	35	45	43	45	43	<input type="text"/>
36	82	82	73	30	<input type="text"/>	73	71	88	47	83	<input type="text"/>
91	54	99	85	71	<input type="text"/>	18	61	92	48	26	<input type="text"/>
26	41	53	87	68	<input type="text"/>	92	22	71	38	87	<input type="text"/>
33	96	87	53	25	<input type="text"/>	74	31	43	63	88	<input type="text"/>
40	84	85	60	93	<input type="text"/>	48	92	66	56	41	<input type="text"/>
16	90	79	87	75	<input type="text"/>	42	78	44	66	51	<input type="text"/>
67	25	38	76	59	<input type="text"/>						<input type="text"/>

OK

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

Participants in a previous study engaged in a word finding task. They were shown a matrix containing letters. Some letters appeared in random order and some formed words by combining

letters next to each other horizontally, vertically or diagonally. A list of all words contained in a given matrix was displayed next to the matrix. The participants were asked and incentivized to find as many words from the list as possible. This task was repeated several times, and each time, they had three minutes available.

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

Their point score was calculated as follows:

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

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

*(INCLUDE MATRIX AND SHOW FOR 30 SECONDS)*

I	Y	A	W	R	O	N	Y	R	O	U	M	H	H	A
G	N	S	W	O	B	S	B	U	E	U	S	C	A	G
Y	A	F	T	Q	L	C	S	S	Y	O	Z	C	X	S
P	P	G	F	O	X	I	H	S	R	B	F	I	C	O
P	A	A	C	G	A	D	C	I	A	R	V	T	A	F
F	J	W	A	E	I	E	O	A	G	A	Q	A	M	P
S	H	P	N	R	L	N	N	A	N	Z	Y	L	E	O
A	T	F	A	M	A	M	Y	I	U	I	Q	Y	X	R
E	Y	R	D	A	R	A	B	M	H	L	A	W	I	T
S	C	N	A	N	T	R	F	G	E	W	B	P	C	U
B	X	N	E	Y	S	K	B	C	D	Q	F	A	O	G
L	D	T	A	K	U	B	F	E	A	P	M	W	W	A
T	S	V	J	R	A	E	N	G	L	A	N	D	V	L
U	E	V	T	P	E	S	W	E	D	E	N	E	E	Z
O	J	J	N	A	W	V	I	E	Y	J	O	I	K	E

'Countries'

- ▲
- AUSTRALIA
- BRAZIL
- CANADA
- DENMARK
- ENGLAND
- FRANCE
- GERMANY
- HUNGARY
- ITALY
- JAPAN
- KENYA
- MEXICO
- NORWAY
- PORTUGAL
- RUSSIA
- SWEDEN
- ▼

*Procedure to determine your earnings:*

<<Math>>

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

<<Verbal>>

Once you have chosen your five individuals, we will calculate your earnings, which are based on the total point score of your selected individuals. You will receive \$0.20 for each point in your selected candidates' third scores. For example, if your five chosen candidates found 50 words

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

*Information on Participants:*

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

<<All>>

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

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

Please remove the cards of the five selected people from the pile.

PLEASE PRESS OK ONLY AFTER YOU RECEIVED THE 20 CARDS.

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

Math Task Candidates

<<MI>>

	Math Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Male	Male	Female	Female	Female
Performance score 1	8	15	15	4	15
Performance Score 2	8	15	14	4	15
Race	White	White	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Male	Female	Female	Male
Performance score 1	10	9	8	14	5
Performance Score 2	11	9	7	14	4
Race	Asian	Asian	Black	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

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

<<M2>>

	Math Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Male	Male	Female	Female	Female
Performance score 1	8	15	15	4	15
Performance Score 2	8	15	14	4	15
Race	White	White	White	White	White
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Male	Female	Male	Male
Performance score 1	10	9	8	14	5
Performance Score 2	11	9	7	14	4
Race	Asian	Asian	Black	White	White
Nationality	American	American	American	American	American

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

### Verbal Task candidates

<<VI>>

	Word Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Female	Female	Female	Male	Male
Performance score 1	6	11	11	13	8
Performance Score 2	9	13	15	12	8
Race	Hispanic	Black	White	White	Black
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Female	Female	Male	Male
Performance score 1	9	13	11	5	12
Performance Score 2	11	9	11	5	11

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

<<V2>>

	Word Participants				
Participant NR	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Gender	Female	Female	Male	Male	Male
Performance score 1	6	11	11	13	8
Performance Score 2	9	13	15	12	8
Race	Hispanic	Black	White	White	Black
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes
Participant NR	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10
Gender	Female	Female	Female	Male	Male
Performance score 1	9	13	11	5	12



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

<<Math>>

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

<<Verbal>>

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

<<Table as before>>

### LOTTERY CHOICE DECISION TASK

We will now present you with a list of lottery questions. You will have two options to choose from: option A and option B. You will have 10 decisions to make.

Once you are done the computer will randomly select 1 of the 10 rows. Then the computer will execute the lottery described in the cell that you have selected in that row and display the lottery

outcome. The computer program will pay out the lottery outcome with a 10% probability. That is, one out of 10 people receive the payoffs of the selected lottery in this task as additional earnings.

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

<<Payoffs lottery task>>

The selected row in the lottery task was <<:D>>

The outcome of the lottery is; <<E>>

Your payoffs are: << F>>>

<<TOTAL PAYOFFS>>

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

<<WE NOW CONTINUE WITH THE QUESTIONNAIRE>>

We now continue with a questionnaire while we are preparing your earnings from the experiment. This will take us at least 15 minutes, so please take your time.

1. Gender (male/female)
2. Age ()
3. Nationality (North-American/South-American/European or Australian or Russian/African/Asian/Middle Eastern)
4. Race (White/Black/Hispanic/Asian/other)
5. School (Harvard/ MIT/Other/Not a student)

6. Field of study (social science/ economics / science / humanities/ NA)
7. Current Program (College/Masters/PhD/other/NA)
8. GPA at college ()
9. SAT scores (Writing/Mathematics/Critical Reading)
10. Parental income (median household income is 4500) below median, at around median, above median)
11. What do you expect *your* annual household income in 10 years to be?
12. Parental education (N.A./ high school/ some college/ college/ PhD)
13. On a scale from 1 to 6, where 1 is not risk averse and 6 is extremely risk averse, how risk averse do you consider yourself?
14. On a scale from 1 to 6, where 1 is not loss averse and 6 is extremely loss averse, how loss averse do you consider yourself?
15. Do you feel happy/unsatisfied/angry/normal/sad/upset/bored/tired/energetic/excited
16. Any comments?

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

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

## B.2 Stage 2 Instructions, For Stage 2 Employers

Treatment Codes	
Treatments	Code
<b>Treat 1 – Math First</b>	T1
Norm Message	T1N
Control	T1C
<b>Treat 2 – Verbal First</b>	T2
Norm Message	T2N
Control	T2C

<<*Italics are notes to the reader/ experimenter*>>

<<**Bold is treatment specific**>>

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

WELCOME!

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

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

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

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

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

**Your Choice. --**

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

your earnings.

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

### Information on Task.

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

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

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

Their point score was calculated as follows:

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

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

(SAMPLE TASK)

Remaining time: 0  
Please hit the OK button NOW!

Round 1  
Please make sure to STOP solving and hit the OK button when the time limit is up.

					Total						Total
20	30	11	40	73	<input type="text"/>	35	45	43	45	43	<input type="text"/>
36	82	82	73	30	<input type="text"/>	73	71	88	47	83	<input type="text"/>
91	54	99	85	71	<input type="text"/>	18	61	92	48	26	<input type="text"/>
26	41	53	87	68	<input type="text"/>	92	22	71	38	87	<input type="text"/>
33	96	87	53	25	<input type="text"/>	74	31	43	63	88	<input type="text"/>
40	84	85	60	93	<input type="text"/>	48	92	66	56	41	<input type="text"/>
16	90	79	87	75	<input type="text"/>	42	78	44	66	51	<input type="text"/>
67	25	38	76	59	<input type="text"/>						

OK

/  
<< (T1N, TIC or T2N, T2C) >>

Participants in a previous study engaged in a word finding task. They were shown a matrix containing letters. Some letters appeared in random order and some formed words by combining letters next to each other horizontally, vertically or diagonally. A list of all words contained in a given matrix was displayed next to the matrix. The participants were asked and incentivized to

find as many words from the list as possible. This task was repeated several times, and each time, they had three minutes available.

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

Their point score was calculated as follows:

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

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

*(INCLUDE MATRIX AND SHOW FOR 30 SECONDS)*

I	Y	A	W	R	O	N	Y	R	O	U	M	H	H	A	
G	N	S	W	O	B	S	B	U	E	U	S	C	A	G	AUSTRALIA
Y	A	F	T	Q	L	C	S	S	Y	O	Z	C	X	S	BRAZIL
P	P	G	F	O	X	I	H	S	R	B	F	I	C	O	CANADA
P	A	A	C	G	A	D	C	I	A	R	V	T	A	F	DENMARK
F	J	W	A	E	I	E	O	A	G	A	Q	A	M	P	ENGLAND
S	H	P	N	R	L	N	N	A	N	Z	Y	L	E	O	FRANCE
A	T	F	A	M	A	M	Y	I	U	I	Q	Y	X	R	GERMANY
E	Y	R	D	A	R	A	B	M	H	L	A	W	I	T	HUNGARY
S	C	N	A	N	T	R	F	G	E	W	B	P	C	U	ITALY
B	X	N	E	Y	S	K	B	C	D	Q	F	A	O	G	JAPAN
L	D	T	A	K	U	B	F	E	A	P	M	W	W	A	KENYA
T	S	V	J	R	A	E	N	G	L	A	N	D	V	L	MEXICO
U	E	V	T	P	F	S	W	E	D	E	N	E	E	Z	NORWAY
O	J	J	N	A	W	V	I	E	Y	J	O	I	K	E	PORTUGAL
															RUSSIA
															SWEDEN

**'Countries'**

*Procedure to determine your earnings:*

<<Math>>

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

<<Verbal>>

Once you have chosen your five individuals, we will calculate your earnings, which are based on the total point score of your selected individuals. You will receive \$0.20 for each point in your

selected participants' third scores. For example, if your five chosen participants found 50 words correctly, they would score a total of 50 points and you would receive \$10 (50x\$0.20). We will inform you of the five chosen persons' total scores and your earnings at the end of this experiment.

*Information on Participants:*

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

<<**T1N**>>

<<*Math*>>

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

<<*Verbal*>>

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

<<**T2N**>>

<<*Verbal*>>

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

<<*Math*>>

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

<<**T1C, T2C**>>

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

Note that you can select each participant only once.

<<**All**>>

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

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

Please remove the cards of the five selected people from the pile.

PLEASE PRESS OK ONLY AFTER YOU RECEIVED THE 20 CARDS.

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

Math Task Candidates

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



Race	White	Black	Black	Asian	Asian
Nationality	American	American	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

### Verbal Task candidates

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

Performance Score 2	12	8	12	13	6
Race	White	Asian	White	White	White
Nationality	American	Other	American	American	American
Boston Area Resident	Yes	Yes	Yes	Yes	Yes

<<Math>>

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

<<Verbal>>

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

<<Table as before>>

### LOTTERY CHOICE DECISION TASK

We will now present you with a list of lottery questions. You will have two options to choose from: option A and option B. You will have 10 decisions to make.

Once you are done the computer will randomly select 1 of the 10 rows. Then the computer will execute the lottery described in the cell that you have selected in that row and display the lottery outcome. The computer program will pay out the lottery outcome with a 10% probability. That is, one out of 10 people receive the payoffs of the selected lottery in this task as additional earnings.

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

12	Probability 10/10 to get \$12 and probability 0/10 to get \$9.6.	Probability 8/10 to get \$23.1 and probability 2/10 to get \$0.60.
13	Probability 10/10 to get \$10 and probability 0/10 to get \$8.	Probability 7/10 to get \$23.1 and probability 3/10 to get \$0.60.
14	Probability 10/10 to get \$10 and probability 0/10 to get \$8.	Probability 6/10 to get \$23.1 and probability 4/10 to get \$0.60.
15	Probability 10/10 to get \$10 and probability 0/10 to get \$8.	Probability 5/10 to get \$23.1 and probability 5/10 to get \$0.60.

<<Payoffs lottery task>>

The selected row in the lottery task was <<:D>>

The outcome of the lottery is; <<E>>

Your payoffs are: << F>>>

<<TOTAL PAYOFFS>>

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

<<WE NOW CONTINUE WITH THE QUESTIONNAIRE>>

We now continue with a questionnaire while we are preparing your earnings from the experiment. This will take us at least 15 minutes, so please take your time.

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

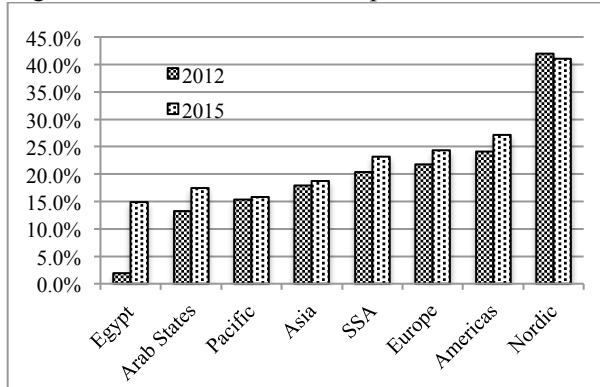
Thank you for your participation. Please remain seated if you are done, until we tell you it is ok for you to leave.

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

## Appendix C: Chapter 4 Supporting Material

### C.1 Figures

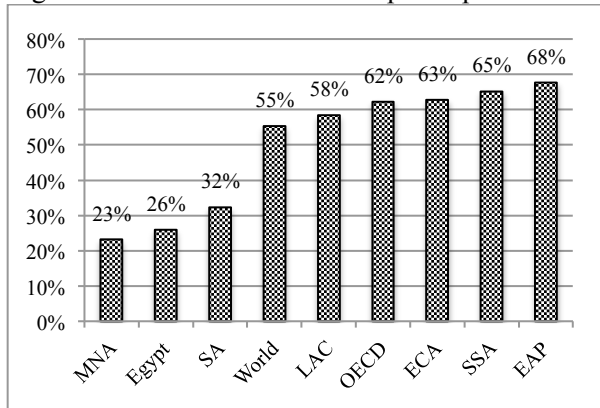
Figure C.1: Percent of female parliamentarians across all chambers (single, lower and upper houses)



Source: Inter-Parliamentary Union (2016)

Note: 2012 data is as of January 1, 2013; 2015 data is as of January 1, 2016; SSA represents Sub-Saharan Africa; European data excludes Nordic countries.

Figure C.2: Female Labor force participation rate in 2014, Percent of female population ages 15-64



Source: World Development Indicators (2015)

Note: Modeled ILO estimate; MNA: Middle East and North Africa (all income levels); SA: South Asia; LAC: Latin America and Caribbean (all income levels); ECA: Europe and Central Asia (all income levels); SSA: Sub-Saharan Africa (all income levels); EAP: East Asia and Pacific (all income levels)

Figure C.3: Share of Men who disagree with the belief that men are better political leaders than women  
 C.3 (a) Percentage of Men  
 C.3 (b) Percent change by country across two waves

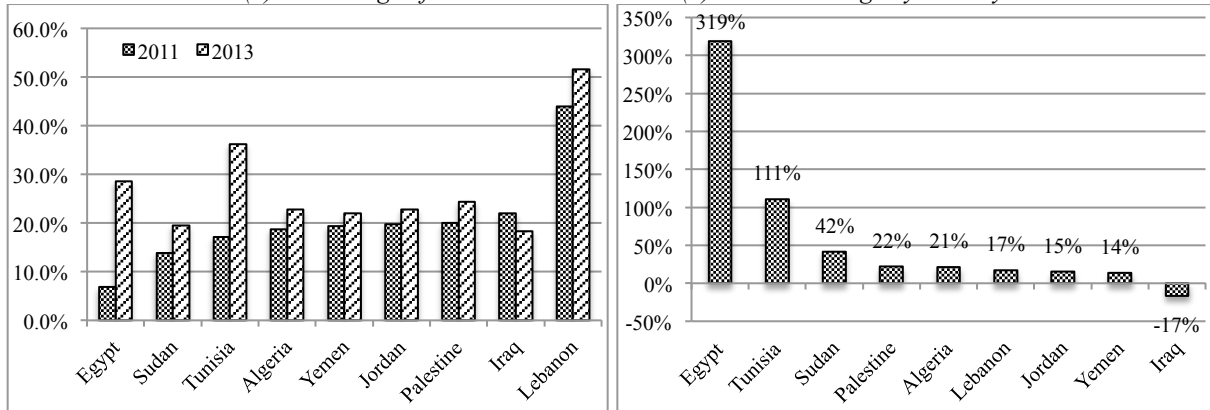


Figure C.4: Share of men who agree that it is ok for a married woman to work  
 C.4 (a) Percentage of Men  
 C.4 (b) Percent change by country across two waves

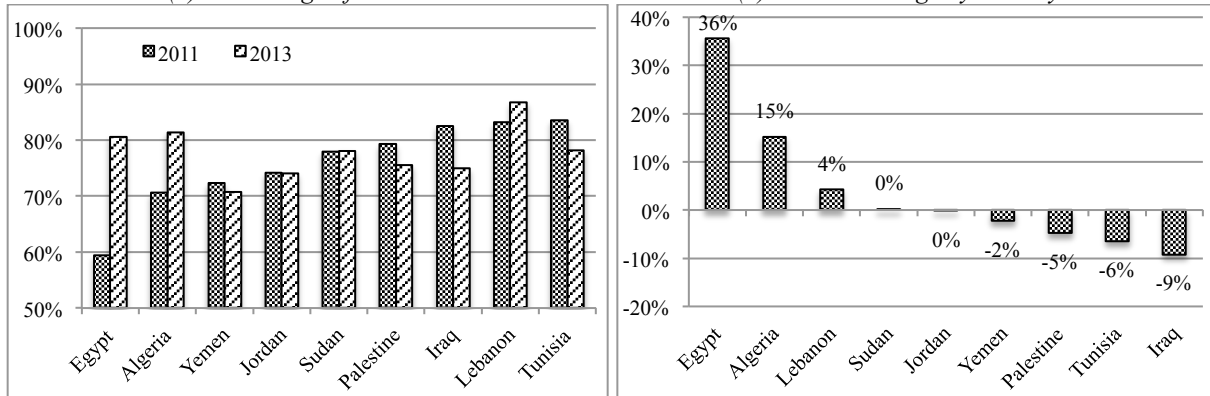
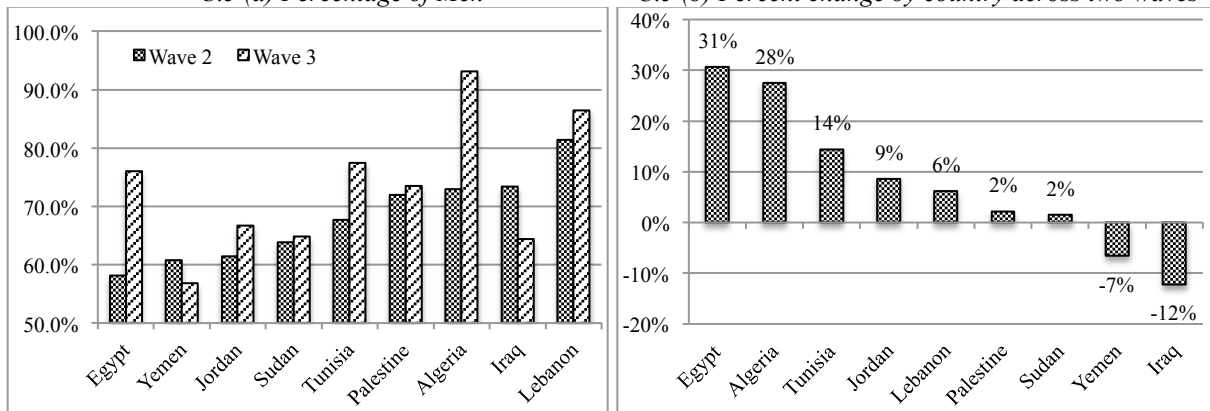


Figure C.5: Share of Men who disagree with the belief that university education is more important for boys than girls, financially struggling households only  
 C.5 (a) Percentage of Men  
 C.5 (b) Percent change by country across two waves



## C.2 Tables

Table C.1: Demographic summary statistics of the pre-crisis and crisis surveys, Male Respondents

	2011 (Pre-Crisis Data)		2013 (Crisis Data)		2011 vs. 2013	
	Mean	N	Mean	N	Difference	p-value
Age	41.122	614	39.395	598	-1.728	0.034
Married	0.808	614	0.734	598	-0.074	0.002
Children	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Tertiary Education	0.237	613	0.258	598	0.021	0.398
Secondary Education	0.352	613	0.415	598	0.062	0.026
Primary Education	0.184	613	0.151	598	-0.034	0.115
No Education	0.227	613	0.177	598	-0.049	0.032
Employed	0.904	521	0.913	520	0.009	0.598
Urban	0.432	614	0.448	598	0.017	0.562
Share of respondents Muslim	0.943	611	0.943	598	0.000	0.975

Source: Author's calculations using data from the Arab Barometer surveys (Tessler et al., 2015)

Table C.2: Survey details and sampling methods

2011 (Pre-Crisis Survey)	2013 (Crisis Survey)
<b>Field Period:</b> June 16 – July 3, 2011	<b>Field Period:</b> March 31 – April 7, 2013
<b>Principal Researcher:</b> Jamal Abdul Jawad	<b>Principal Researcher:</b> Hesham Gaafar
<b>Partner:</b> Al-Ahram Center for Strategic Studies	<b>Partner:</b> MADA Center for Media and Communication Strategies
<b>Total Sample Size:</b> 1,219	<b>Total Sample Size:</b> 1,196
<b>Sampling method:</b> “The survey represents a national probability sample design of adults 18 years and older. It was conducted face-to face in Arabic and used a complex sample design, which included stratification and clustering. The survey was stratified by governorate and further stratified by urban-rural. Interviews were distributed proportional to population size. Within each strata, sampling blocks, which are designated by the Central Agency for Public Mobilization and Statistics (CAPMAS), were selected proportional to population size and served as the primary sampling unit. Within each sampling block, clusters of 10 households were randomly selected. Additionally, five governorates with a high percentage of Christians were selected with certainty. In total, 520 interviews were conducted in urban areas and 699 in rural areas.”	<b>Sampling method:</b> “The survey represents a national probability sample design of adults 18 years and older. It was conducted face-to face in Arabic and used a complex sample design, which included stratification and clustering. The survey was stratified by governorate and further stratified by urban-rural. Interviews were distributed proportional to population size with the exception of the Red Sea and Suez governorates where twenty interviewers were assigned to each. Within each strata, sampling blocks, which are designated by the Central Agency for Public Mobilization and Statistics (CAPMAS), were selected proportional to population size and served as the primary sampling unit. Within each sampling block, clusters of 10 households were randomly selected. In total, 536 interviews were conducted in urban areas and 660 in rural areas.”

Source: Tessler et al. (2015)

Table C.3: Countries surveyed at the cusp of the Arab Spring and its aftermath

Country	Revolution	Protests	Description	Arab Barometer Wave II Survey	Arab Barometer Wave III Survey
Egypt	Yes		First protests break out across Egypt on January 25, 2011 with Mubarak stepping down on February 11, 2011 and first parliamentary elections held in November. Protestors returned to Tahrir square in January 2013 and crisis ensues.	June 16 – July 3, 2011	March 31 – April 7, 2013
Tunisia	Yes		Events began on 18 December 2010 and in January 2011, longtime president Zine El Abidine Ben Ali was ousted; On October 23, 2011, Tunisians voted for the first time post-revolution.	Sep. 30 – Oct. 11, 2011	February 3 – 25, 2013
Yemen	Yes		A major demonstration took place on January 27, 2011, followed by a series of other protests. Finally, a presidential election was held on February 21, 2012, with Hadi running unopposed ending President Saleh's 33-year rule.	Feb. 1 – 15, 2011	November 2 – December 4, 2013
Algeria		Yes	A wave of protests and riots started on December 28, 2010 throughout Algeria and continued to January 2012.	April 15 – May 11, 2011	March 13 – April 6, 2013
Iraq		Yes	Protests began in February 2011 in the wave of the Egyptian and Tunisian revolution and continued throughout the year.	Feb. 20 – March 12, 2011	June 6 – 29, 2013
Jordan		Yes	Series of protests began January 14, 2011 and continued to November 2012.	Dec. 10 – 16, 2010*	December 27, 2012 – January 6, 2013
Sudan		Yes	Protests started on January 30, 2011 until December 2011, and were reignited again in June and July 2012 against the government's austerity measures, and again in September and October 2013 against fuel prices.	Dec. 12 – 30, 2010 and March 24 – April 23, 2011	April 29 – May 29, 2013
Palestine		Yes	Sporadic protests began on February 3, 2011 first, in support of protesters in Tunisia and Egypt and continued until February 14, 2013, when Palestinian Authority Prime Minister Salam Fayyad submitted his resignation along with that of his cabinet to President Mahmoud Abbas.	Dec. 2 – 5, 2010*	December 20 – December 29, 2012
Lebanon		Yes	Protests began on February 27, 2011 and continued throughout the year.	Nov. 24 – Dec. 6, 2010 and April 9 – 24, 2011	July 3 – July 26, 2013

\*Survey was conducted *before* the events of the Arab Spring  
Source: Tessler et al. (2015)

Table C.4: Probit Regression for Government Satisfaction on Confidence in Women's Political Leadership Ability, Marginal Effects at Means, Men only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			2013 only		2013 only		2013 only
Year2013	0.226*** (0.022)	0.235*** (0.027)		0.233*** (0.023)		0.255*** (0.045)	
Gov Satisfaction		-0.004 (0.015)	0.014 (0.067)				
GovDem Transition				-0.003 (0.014)	-0.072 (0.057)		
Gov Corruption						-0.013 (0.022)	-0.094 (0.106)
Employed	0.005 (0.015)	-0.002 (0.018)	-0.009 (0.071)	0.006 (0.015)	0.035 (0.056)	0.006 (0.017)	0.020 (0.063)
Married	-0.021 (0.019)	-0.024 (0.022)	-0.046 (0.072)	-0.021 (0.019)	-0.033 (0.061)	-0.024 (0.021)	-0.033 (0.063)
Tertiary Education	0.033 (0.026)	0.038 (0.030)	-0.015 (0.091)	0.011 (0.023)	-0.047 (0.075)	0.034 (0.029)	0.007 (0.085)
Secondary Education	0.012 (0.018)	0.006 (0.020)	-0.053 (0.075)	0.007 (0.018)	-0.022 (0.063)	0.012 (0.020)	-0.011 (0.069)
Primary Education	0.032 (0.023)	0.026 (0.025)	-0.023 (0.081)	0.028 (0.023)	0.028 (0.072)	0.047 (0.030)	0.074 (0.080)
Observations	1,174	959	362	1,091	518	1,143	543
Pseudo-R2	0.120	0.150	0.084	0.132	0.049	0.125	0.041

Notes: The table presents Probit regression results with marginal effects at means reported in percentage points with 2011 as the baseline comparison in all columns. The dependent variable is a binary variable that equals 1 if individuals disagree with men being better political leaders than women, and 0 otherwise. GovSatisfaction variable equals 1 if individuals rate their satisfaction with the government at 7,8,9, or 10, on the scale of 1 to 10, and 0, otherwise. GovDemTransition variable equals 1 if individuals evaluate the government's performance in managing the process of democratic transition process as Very good/good and 0, otherwise. GovCorruption variable equals 1 if individuals believe there is corruption within the state's institutions and agencies and 0, otherwise. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual, financial status of the household (1 if household has sufficient income to cover expenses, 0, otherwise), whether their home is owned vs. rented, and age are also controlled for. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.



Table C.5: Probit Regression for Leadership Distrust on Confidence in Women’s Political Leadership Ability, Marginal Effects at Means, Men only

	(1)	(2)	(3)
Year2013	0.226*** (0.022)	0.210*** (0.029)	0.225*** (0.023)
Distrust in Muslim Brotherhood		0.011 (0.012)	
Distrust in Government/Cabinet			-0.015 (0.017)
Employed	0.005 (0.015)	0.002 (0.013)	0.009 (0.017)
Married	-0.021 (0.019)	-0.021 (0.017)	-0.022 (0.021)
Tertiary Education	0.033 (0.026)	0.020 (0.022)	0.040 (0.030)
Secondary Education	0.012 (0.018)	0.009 (0.016)	0.013 (0.021)
Primary Education	0.032 (0.023)	0.029 (0.022)	0.038 (0.027)
Observations	1,174	1,141	1,161
Pseudo-R2	0.120	0.128	0.123

Notes: The table presents Probit regression results with marginal effects at means reported in percentage points with 2011 as the baseline comparison in all columns. The dependent variable is a binary variable that equals 1 if individuals disagree with men being better political leaders than women, and 0 otherwise. Leader distrust variables equal 1 if individuals believe that the leaders are trustworthy and 0, otherwise. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual, financial status of the household (1 if household has sufficient income to cover expenses, 0, otherwise), whether their home is owned vs. rented, and age are also controlled for. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

Table C.6: Share of men who do not believe that religious leaders in their country are trustworthy

	Wave 2	Wave 3	Percentage Change
Tunisia	N.A.	46.9%	N.A.
Lebanon	N.A.	44.5%	N.A.
Egypt	4.4%	36.6%	725%
Palestine	N.A.	28.9%	N.A.
Algeria	N.A.	26.9%	N.A.
Jordan	N.A.	21.8%	N.A.
Yemen	N.A.	19.5%	N.A.
Sudan	N.A.	19.4%	N.A.
Iraq	N.A.	15.5%	N.A.

Table C.7: Probit Regression for Support for Married Woman's Work, Marginal Effects at Mean, Men Only

	Financially Struggling Households				Financially Secure Households			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year2013	0.221*** (0.032)	0.221*** (0.031)	0.176*** (0.042)	0.176*** (0.036)	0.156*** (0.049)	0.149*** (0.043)	0.180*** (0.048)	0.134** (0.054)
Poor Evaluation of Current Economy		-0.022 (0.049)				-0.074 (0.069)		
Pessimistic Economic Outlook			0.113** (0.048)	0.075 (0.051)			-0.095 (0.076)	
Distrust in Religious Leaders				0.160*** (0.050)				0.149** (0.060)
Employed	0.054 (0.050)	0.052 (0.050)	0.041 (0.052)	0.041 (0.053)	-0.109 (0.069)	-0.096 (0.063)	-0.120* (0.069)	-0.104 (0.071)
Married	-0.097* (0.055)	-0.097* (0.055)	-0.081 (0.059)	-0.065 (0.059)	-0.041 (0.076)	-0.035 (0.070)	-0.035 (0.079)	-0.029 (0.078)
Tertiary Education	0.188*** (0.059)	0.181*** (0.060)	0.211*** (0.061)	0.191*** (0.062)	0.113 (0.106)	0.111 (0.098)	0.101 (0.108)	0.128 (0.109)
Secondary Education	0.055 (0.049)	0.054 (0.049)	0.065 (0.051)	0.047 (0.051)	0.005 (0.098)	0.015 (0.091)	0.011 (0.099)	0.017 (0.102)
Primary Education	0.037 (0.054)	0.036 (0.054)	0.04 (0.056)	0.033 (0.057)	0.024 (0.113)	0.033 (0.101)	0.035 (0.115)	0.029 (0.115)
Observations	860	859	820	810	333	332	322	329
Pseudo-R2	0.071	0.071	0.078	0.084	0.063	0.067	0.072	0.074

Notes: The table presents Probit regression results with marginal effects at means reported in percentage points with 2011 as the baseline comparison. The dependent variable is support for married women working outside of the home, which equals 1 if individual agrees that a married woman can work outside the home, and 0, otherwise. Poor evaluation of current economy variable is equal to 1 if individual believes that the economic situation is very good/good, and 0, otherwise. Pessimistic economic outlook variable is equal to 1 if individual believes that the economic situation will become worse or much worse in the next few years, and 0, if they believe the economic situation will stay the same or improve. Both are evaluated at zero. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual and age are also controlled for. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

Table C.8: Probit Regression of Support for Girls' University Education, Marginal Effects at Means, Men Only

	(1)	(2)	(3)
	All men	Financially Struggling HH	Financially Secure HH
Year2013	0.149*** (0.027)	0.190*** (0.032)	0.071 (0.054)
Employed	0.043 (0.041)	0.058 (0.049)	0.010 (0.070)
Married	-0.027 (0.044)	-0.059 (0.055)	0.002 (0.071)
Tertiary Education	-0.005 (0.054)	0.019 (0.063)	-0.075 (0.111)
Secondary Education	0.007 (0.044)	0.017 (0.050)	-0.041 (0.100)
Primary Education	0.045 (0.048)	0.083 (0.054)	-0.095 (0.122)
Observations	1,174	844	330
Pseudo-R2	0.033	0.042	0.041

Notes: The table presents Probit regression results with marginal effects at means reported in percentage points with 2011 as the baseline comparison in all columns. The dependent variable is a binary variable that equals 1 an individual disagrees with university education being more important for a boy than a girl, and 0 otherwise. Demographic variables such as employment status (1 if employed, 0 if not employed), marital status (1 if married, 0 if not married), binary education variables (baseline being no education), urban vs. rural (1 if urban, 0 if rural), whether individual is bilingual, financial status of the household (1 if household has sufficient income to cover expenses, 0, otherwise – Column (1) only), whether their home is owned vs. rented, and age are also controlled for. \*\*\* Significance at the 1 percent level. \*\* Significance at the 5 percent level. \* Significance at the 10 percent level.

Table C.9: Personal Religiosity

	2011				2013			
	Secular	Non-Secular	Diff.	<i>p</i> -value	Secular	Non-Secular	Diff.	<i>p</i> -value
Reads the Quran always/most of the time	80%	59%	0.21	0.000	76%	84%	-0.08	0.070
Prays Always/Most of the time	93%	96%	-0.03	0.231	88%	95%	-0.07	0.038
Attends religious services Always/Most of the time	95%	92%	0.03	0.104	94%	94%	0.00	0.978
Identifies themselves as religious	40%	46%	-0.06	0.189	36%	56%	-0.21	0.000

Note: *p*-values represent two-sample t-test of means.

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