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Abstract

We study the gender gap in a competitive environment by exploiting the "naturalistic experiment" of a TV game show with self-selected participants and no gender-specific constraints nor discrimination. Games consist of multiple rounds where contestants answer general knowledge questions privately. One participant is eliminated or leaves voluntarily at the end of each round. Women earn 40% less than men and exit the game at a faster rate, but especially when in a minority. This latter result highlights the importance of structural arrangements in organizations that interact with behavior to maintain "glass ceilings" and explains the differential gender-related risk attitudes observed.

Keywords: discrimination, TV game shows, gender differences, glass ceilings, minority behaviors.

Introduction

Today, gender equality is an important issue. For too long, it has been argued, society has ignored or suppressed the potential contributions of females in business, the arts, science, and politics, and this has resulted in two major costs. First, the aspirations of a huge fraction of society have been frustrated. Second, society has failed to profit fully from the potential contributions of women.

Despite legislation aimed at gender equality, the fact remains that male-female wage disparities are still large (Wood, Corcoran, & Courant, 1993; Blau & Kahn, 2000[1]). Moreover, there are few women in top jobs. In 2005, for example, women accounted for 46.5% of the U.S. workforce but less than 8% of its top managers.[2] Moreover, in a study published in 2001, only 2.5% of the five highest paid executive positions in a large sample of U.S. firms were held by women (Bertrand & Hallock, 2001[3]). In politics, the situation is not much better. True, there are many elected female representatives in different countries and quite a few head ministries. Nonetheless, women are still in the minority in terms of power and few become head of state. Angela Merkel in Germany is a current exception.[4]

There are basically two ways of promoting gender equality. One is through legislation and the other by creating new social norms and attitudes (and thus behavior). However, both are imperfect. The former can be mandated immediately but may not be effective in practice; the latter is effective but hard to implement. Many would argue

[1] Blau and Kahn (2000) report that in the US, the female-male weekly earnings ratio of full-time workers was 76.3% in 1994-98.
[2] "Women in business," *The Economist*, July 21st, 2005.
[3] The authors report that the number of female executives was steadily increasing in larger U.S. corporations in the 1990s. However, there is no evidence that women are gaining access to the top occupational group (CEOs, Chairs, Vice Chairs, and Presidents). In fact, in Bertrand and Hallock's (2001) data, the proportion of women in this group was declining.
[4] Recent evidence from France shows the existence of male bias in the legislative elections whereby male candidates are more likely to be elected (Fréchette, Maniquet, & Morelli, 2008).

that, in an ideal world, legislation would not be necessary and, instead, gender equality would simply reflect societal norms.

The advent to positions of power in society by women is, of course, a recent phenomenon. Thus, we should not exclude the importance of how women have been socialized in the past. For example, if – from one day to the next – we could rid society of gender inequality, would women still defer to men? This is an important question for social policy. If the answer is negative, much more could be achieved through legislation. However, a positive answer would mean that women's current attitudes and behavior are themselves obstacles to gender equality and become self-fulfilling prophecies. In other words, it may not be just the attitudes and norms of men that need to be changed, but the very attitudes and norms of women themselves. Moreover, since women's attitudes and behavior are products of their position in society (Ridgeway & Smith-Lovin, 1999), affirmative action would also need to take account of – and even modify – the social structures present in today's organizations.

This paper reports a novel empirical investigation of this issue in which we exploit the naturalistic experiment of a TV game show. In this game, contestants earn money by answering general knowledge questions across five rounds and must decide, at the end of each round, whether to stay in the game or leave. If they leave, contestants keep the money earned for correct answers; however, if they fail to leave and turn out to have the lowest "score" of the remaining contestants, they are expelled from the game and lose all their earnings. The game starts with six contestants and one contestant leaves voluntarily or is expelled at the end of each of five rounds. At the end of five rounds, the overall winner emerges. Note that in this game the rules make no distinctions between men and women. Thus, if gender differences emerge, they are a

consequence of abilities, attitudes, and behaviors that contestants themselves bring to the game.

This paper is organized as follows. In the next section, we review briefly the literature on game shows and comment on gender differences in risk attitudes and competitiveness. We then discuss the role of situational and structural factors in creating gender gaps in the work place. This is followed by a detailed description of the game that we analyzed. Next we present the specific questions of this investigation and the results of our analysis.

In short, although our games start with approximately equal numbers of male and female contestants, we find that women earn less than men and exit the game at a faster rate. In particular, there are more voluntary withdrawals by women than men. Importantly, women leave the game voluntarily more when the proportion of women with whom they are competing decreases. By contrast, men's decisions to stay or leave are not affected by the gender composition of the groups.

We conclude by drawing an analogy between the game and the process by which employees rise through the levels of a corporation except that the game is free of many constraints typically faced by women. Our results therefore imply that one reason for current "glass ceilings" lies in women's own behavior. This, in turn, probably reflects socialization practices, the expectations of gender-specific behavior, and the unequal situation of genders in societal and organizational structures. Our study suggests two important implications. First, to reduce voluntary turnovers, it is important to retain a sufficiently high proportion of women to men in work groups. Second, promoting and maintaining gender diversity at the lower/middle ranks of organizations is necessary to obtain gender diversity at the top.

Game shows

There should be little surprise that TV game shows have attracted the attention of researchers interested in how people take risky decisions. From a research perspective, there are several advantages and disadvantages. For the former, one can highlight that the games involve real and, often, substantial payoffs; participants come from a wide public that is more general than the mainly student participants recruited for experiments; and many choices faced by participants should depend on explicit probabilistic reasoning. On the other hand, the games involved can be quite hard to model analytically, and the public nature of the "entertainment" probably has some effects on the type of people who participate as well as on their actual behavior during the game.

Many papers have used game shows to elicit risk attitudes in the presence of substantial payoffs (see, e.g., Beetsma & Schotman, 2001; Blavatsky & Pogrebna, 2008; Gertner, 1993; Metrick, 1995; Post, van den Assem, Baltussen, & Thaler, 2008). In an illuminating review of this work, Andersen, Harrison, Lau, and Rutström (2008) point out the methodological difficulties researchers face in doing this and make some constructive suggestions. Risk attitude, however, has not been the only topic. Pogrebna (2008), for example, has investigated whether contestants who have an opportunity to seek advice from the audience are influenced by the advice. They find that they are not.

From our perspective, a study by Larkin and Pines (2003) is of special interest because they document significant differences between male and female participants in game shows. Specifically, compared to males, the latter consider going on shows to be more personally risky and have greater concerns about appearing badly in public. Indeed, in some shows women are a distinct minority. Other researchers have documented gender related differences in risk attitudes and performance. Women have

been seen to take less risk than men (Daghofer, 2007; Mulino, Scheelings, Brooks, & Pfaff, 2006) and to earn less (Johnson & Gleason, in press).

Gender discrimination and preference for competition

In the work place, the most cited reasons for the lack of women in upper level management are preference differences related to child rearing, discrimination, and more recently, gender differences in preferences for performing in competitions. Preference differences related to child rearing are undoubtedly important. For example, in a study of MBAs who graduated from a leading business school, Bertand, Goldin, and Katz (2009) found that the presence of children contributes to less job experience, greater career discontinuities, and shorter work hours for women. In this paper, we focus on the other two explanations.

Gender discrimination has been extensively documented both with laboratory and field data. Evidence suggests that women are generally less likely to be promoted than males, and if they are promoted, they have stronger performance ratings than males (Lyness & Heilman, 2006). That is, women are held to stricter standards for promotion and, to be considered eligible for high leadership positions, have to be more impressive than men. Even minor gender bias in performance evaluation can trigger dramatic gender gaps at the top level of an organization. For example, in a computer simulation of the consequences of gender bias in an organization with eight hierarchical levels, Martell, Lane, and Emrich (1996) showed that, starting with equal numbers of men and women, a 1% evaluation bias favoring men can lead to almost twice as many men at the top.

The evidence for gender differences in preferences for competitions has been mainly experimental. In a series of controlled experiments, Gneezy, Niederle, and

Rustichini (2003) showed that men and women differ in their "drive" to perform well in mixed-sex competitive environments. Men's performance increases with the competitiveness of the environment, thereby creating a gender gap in performance in winner-takes-all contests. Similarly, Niederle and Vesterlund (2007) provide experimental evidence that, when given the choice, men as opposed to equally skillful women, self-select more into competitive as opposed to non-competitive compensation schemes.

In a recent study, Gneezy, Leonard, and List (in press) emphasized the importance of socialization in gender preferences by comparing preferences for selecting into competitive environments by members of the patriarchal Maasai (in Tanzania) with those of the matrilineal Khasi (in India). Whereas Maasai men chose competitive environments more often than Maasai women, Khasi women chose competitive environments more often than Khasi men. From early childhood, men and women are taught appropriate societal behavior for their gender. The learned gender stereotypes affect thoughts and motivations as well as guide behavior (e.g., Martin & Halverson, 1981; Martin, Wood, & Little, 1990).

The role of nurture is also emphasized in data of school students' attitudes across ages. Ahlgren and Johnson (1979) reported that the greatest gender difference in attitudes towards cooperation versus competition appears in grades 8-10, with female students showing consistently more positive attitudes toward cooperation, and males showing consistently more positive attitudes toward competition.

Anticipated punishment for deviations from expected behaviors is one mechanism that reinforces behavior consistent with gender stereotypes. For example, Bowles, Babcock, and Lai (2007) showed that gender differences in the general tendency for males to initiate negotiations more than females (Babcock & Laschever,

2003) can be explained by the negative reactions women experience when they initiate negotiations.

Pressures for maintaining gender identity by conforming to gender stereotypes is greater when gender is more salient, for example, in a mixed-sex context. Booth and Nolen (2009) provide evidence that girls from single-sex schools develop different attitudes toward risk and competition than girls co-educated with boys. In a controlled experiment, students aged just under 15 from single-sex and coeducational schools were put together in groups, asked to solve some mazes, and then given a choice between tournament-style and competition-free evaluation of their performance. Girls from single-sex schools choose tournaments more than girls from coeducational schools.

Literature on gender differences in negotiations (for a review, see Kray & Thompson, 2005) further suggests that performance is linked more to pay in the heads of men than women and that, in competitive tasks, whereas males orient themselves more to the impersonal task of maximizing earnings, women demonstrate a greater concern for relationships (Rubin & Brow, 1975; Kray & Thompson, 2005). In addition, compared to women, men engage more in "intentional" information use (Deal, 2000).

In our data, discrimination, preference differences related to child rearing, and differences in preferences for competing can be ruled out as explanations for gender effects. First, the proportion of men and women is approximately the same at the beginning of the game and decisions to stay or withdraw from the game are taken individually and independently by each contestant. Second, child rearing is not in conflict with the "job" of participating in the game. Third, women were aware of the competitive nature of the game when they decided to become contestants in the first place.

Structural and situational effects

Gender effects may explain some individual behavior but they are often confounded by situational and structural factors (Kanter, 1977a; Ely & Padavic, 2007). For example, highly placed women in organizational hierarchies are often "tokens" in groups dominated numerically by men. Therefore, conclusions about their behavior can confuse effects of situation and gender. The same can be said about women occupying lower power and status positions in organizational and social structures: their behavior inevitably reflects their lower power positions.

In fact, literature on gender identity suggests that the juxtaposition of gender and power/status – higher status and competence being associated more with men than with women – implies that gender is largely a status characteristic (Ridgeway & Smith-Lovin, 1999). Wagner and Berger (1997) proposed that differences in stereotypical gender tasks are a direct function of status differences between genders or of attempts to cope with these differences. Gender status beliefs also affect the evaluations that men and women receive in the work place and thereby contribute to glass ceilings (Ridgeway, 2001). Moreover, existing structural inequalities between men and women perpetuate the status beliefs that associate greater status worthiness with men than women.

In a related vein, Kanter (1977b) suggests that the hierarchical arrangements of organizations as well as how social groups differ in relative numerical representation can account for what at first glance appear to be "gender phenomena." That is, power structures and organizational demography are not only the result but also the origin of gender inequalities.

For example, there is evidence that people's positions in organizational structures, not their gender, shape career attitudes. Cassirer and Reskin (2000) report

that gender differences in career aspirations and attitudes towards promotion[5] can be fully explained by workers' organizational locations and prior promotions. The fact that men are more likely to occupy organizational positions that encourage hope for promotion may explain why they attach greater importance to career aspirations than women. Women respond to lower upward mobility within organizations by limiting their aspirations. Importantly, men tend to behave similarly when placed in positions with low chances of advancement (Kanter, 1977b).

As to proportional representation of socially different sub-groups, "tokens" face more pressures in organizations than "numerical dominants" (Kanter, 1977a). Field data suggest that minority achievements are diminished in majority-dominated work groups. For example, Spangler et al. (1978) used data on male and female achievements at two law schools with different gender ratios and found that social influences such as performance pressure, social isolation, and role entrapment operated to diminish women's performance when they were in a small minority.

Similarly, literature on organizational demography suggests that turnover is more likely among employees who are more dissimilar in terms of their ascribed characteristics (Wagner, Pfeffer, & O'Reilly III, 1984; Jackson et al., 1991). Moreover, women are more sensitive than men to the effects of gender composition. For example, Elvira and Cohern (2001) analyzed turnover rates from ten business units of a *Fortune* 500 financial firm over a period of three years and found that women were less likely to leave the firm voluntarily when more women were employed at their job level. By contrast, men's turnover was not significantly affected by the gender composition at the same job level.

[5] In a random sample of U.S. workers (the 1991 General Social Survey), nearly 66% of employed male respondents said that a promotion was important or very important compared to 56% of the female respondents (Cassirer & Reskin, 2000).

Tolbert et al. (1995) analyzed turnover in a sample of 50 academic departments, and similarly found that the proportion of women had a negligible impact on turnover among male faculty. Literature on tokenism has also consistently reported that unlike women, men do not seem to suffer from the negative effect of being a token (Zimmer 1988). This evidence suggests that being "the few" in a skewed work group has different consequences for men and women. One explanation is that because men are accorded greater power and social status in society, their experiences of being in the numerical minority are less negative than those of women (Konrad, Winter, & Gutek, 1992).

Experimental evidence also suggests that group demography is an important situational variable that can shape women's behavior in competitive situations. For example, Gneezy et al. (2003) reported that the gender gap in performance in competitive environments was stronger when women had to compete against men than in single-sex tournaments.

The game

We analyzed the first season of a game called "El Jugador" ("The Player") that was broadcast in Colombia by RCN TV in the first trimester of 2007. It is important to emphasize that all episodes of this new game were recorded before any broadcasts were made so that no contestant had any specific knowledge about the game before participating in it. Thus, since the game was new to all contestants, there was no confounding effect of differential knowledge.[6]

Participants were recruited by channel personnel who traveled to major cities in Colombia. Public announcements of a new game were made locally using regular

[6] In fact, the game has only been broadcast twice: once, the initial version that we analyze, and secondly in a celebrity version.

media, and the channel personnel interviewed those who attended the recruitment meetings. There was no attempt to have a random sample of the Colombian population. Instead, the organizers developed a set of criteria to select contestants with a view to establishing a pool of literate, vocal, heterogeneous people, with at least a middle level income, inclined to take risks, and who would feel relatively comfortable in front of the camera.

Among people who responded to the recruiting announcements, there were approximately 60% men and 40% women. The organizers then recruited more female players by approaching potential contestants at commercial malls. Of the 216 selected contestants, 102 (47%) were women. Based on the selection criteria, the female contestants on the show were probably more extraverted and risk-seeking than the average women in Colombia. Contestants varied in age between 18 and 65 (median of 30) and, in terms of occupation, could be classified as students (21%), professionals (69%), and others (10%). These proportions were almost identical for men and women.

The game was based on answering general knowledge questions. The questions were taken from diverse domains such as sports, celebrities, soap operas, universal and local history, simple math, arts, geography, and others. Given the range of the domains, an overall gender bias in the questions is unlikely.[7] We distinguish between three sets of games. The first were "regular" games broadcast each day from Monday through Saturday for six consecutive weeks. Thus there were 36 different regular games. The winner of each regular game (Mondays through Saturdays) participated in a "Sunday" game with the other winners from the same week. Thus there were 6 different Sunday games. Finally, the six winners of these Sunday games played in a grand final game at the end of the season. Given that the stakes were a lot higher in the single, grand final

[7] Examples of the questions used can be obtained from the authors.

game, we limit our analysis in what follows to the 36 regular and six Sunday games (exceptions are explicitly indicated).

The organizers of the game arranged groups of six contestants trying to maximize the variety of profiles in each group, as well as to balance the numbers of men and women. Of the 36 groups in the regular games, 26 were composed of three men and three women, eight groups included four men and two women, and the two remaining groups included two men and four women.

Prior to starting each game, there is a meeting of the six contestants where they introduce themselves to each other and may engage in strategic behavior. For example, during this presentation they may tell the truth or lie. (In the broadcasts, it is shown on-screen whether they are lying or not). Contestants are also asked privately how "strong" they perceived the others to be based solely on that first encounter.

Each game consists of five rounds of general knowledge questions (eight questions in the first round and five in each of the subsequent rounds). From the perspective of each contestant, all questions are asked publicly but answered privately using an individual screen. Correct answers are rewarded with monetary values that increase across rounds.

After each round, contestants are ranked according to the money they have accumulated up to that point in the game. Also, after each round they have to decide whether to stay or withdraw from the game. If a contestant withdraws, s/he can keep her/his accumulated prize money. If nobody withdraws, the last contestant in the rankings is expelled and loses all of her/his accumulated prize money. Ties are broken using the time contestants took to answer. (Faster is better). The decision to withdraw is made by pushing a special button.

If several contestants manifested their decision to withdraw by pushing the withdrawal button, only the player who was the first to do so actually leaves the game. Contestants who were slower in pushing the button stay in the game and face no immediate material consequences for their decision to withdraw. In the analyses that follow, we pool together all decisions to withdraw – i.e., all instances of pushing the decision button, both resulting in actual exits and not. All exceptions are explicitly indicated.

Contestants are allowed and encouraged to interact publicly after each round of questions in order to gain strategic advantages (e.g., by bluffing). The host asks questions about performance and opinions and contestants may say whatever they want. There is no sure way for the participants to figure out who was lying and who was not. There were many such interactions that took a significant amount of the game time. We were able, therefore, to observe and code types of behavior for all participants in each round. The following are some examples of contestant interactions:

"*I did great in this round. Questions were very simple*!"

"*I feel extremely confident.*"

"*You (addressing other contestant) seem very upset; you should leave before losing everything, because I am doing great!*"

"*You clearly seem to ignore all these topics, leave while you can.*"

"*Be sure that I am not withdrawing, believe me, you better push that button.*"

Finally, the game show host gives the contestants a 10-second warning before the withdrawal button needs to be pushed. During these ten seconds, the contestants can also behave strategically by addressing comments to their competitors.

During the game participants don't know their own rank. The only feedback each receives is her/his number of correctly answered questions during the last round played and the total money accumulated.

Each round ends with a private debriefing interview with the contestant that withdrew or was expelled in which the rankings are revealed and impressions about performance relative to others are discussed.

The financial stakes of the game are quite high. Across rounds, the rewards for correct answers vary from 75 USD (round 1) to 375 USD (round 5). Questions were selected by the organizers to be approximately equal in difficulty across rounds.

Two researchers coded all the data by watching replays of all 43 episodes of the game show. Most of the data were easy to obtain and code, (e.g., numbers of correctly answered questions, accumulated gains, and so on). However, others concerning the behavioral attitudes expressed by contestants required subjective judgments made by assigning behaviors to small, discrete categories. The subjective judgments of the two coders were highly correlated. They agreed initially on 98% of events coded. When they disagreed, they reran the recording of the relevant part of the show to reach agreement by consensus.

Main questions

The main question motivating our investigation is whether gender effects disappear in competitive situations when one controls for discriminatory practices and preferences for special considerations such as child rearing. Thus, since we start the games with an approximately equal gender ratio, the null hypothesis is that of no differences in the gender ratio as the game progresses across rounds.

If the null hypothesis of equal gender ratio as the game progresses is rejected, what factors could explain any ensuing gender gap? We first analyze whether women who self selected into the public competition quit the game more often than men. Experimental evidence suggests that when given a choice, women as opposed to equally skilful men, self-select less into competitive environments (Niederle & Vesterlund, 2007). Our data provide a unique opportunity to analyze the behavior of women who had already entered the competitive environment. Do they stay in the competition as long as men?

The next question we pose is what structural and situational factors can explain differences in the behavior of men and women in the competitive environment. One important factor identified in the literature is the proportion of women relative to men in organizational units (see above). Thus, based on literature on organizational demography and tokenism (Elvira & Cohern, 2001; Tolbert et al., 1995; Zimmer, 1988), we hypothesize that men's and women's decisions to leave the game will be differentially affected by the gender composition of the groups. Reflecting the greater power and status accorded to men in society, men's experiences of being in the numerical minority are less negative than those of women (Konrad, Winter, & Gutek, 1992) and thus men should be less sensitive to the gender ratio than women. In other words, whereas we expect that women are more likely to exit the game as the proportion of females remaining in the game falls, we do not expect an analogous effect for men. Finally, since the gender compositions of the groups change every round as a consequence of eliminations and withdrawals, we can test this hypothesis with our data.

Results

As noted above, we report data for six weeks of the show involving 36 regular games and six Sunday games. Of the 216 players, 90 were expelled and 155 decided to leave the game voluntarily (i.e., pushed the decision button). Of these 155 decisions, 125 resulted in actual withdrawals. The mean payoff that contestants took home was 2,618 USD, with a median of 625 USD. The winner of the final game (a man) earned 29,625 USD. We report general results on the behavior of all contestants first and then describe gender-specific results.

Withdrawals. Table 1 presents the number of people who decided to withdraw in each round (aggregated across all games). The decision to withdraw was taken 155 times in the coded shows.

Insert Table 1 about here

Do players decide to withdraw too often or too seldom? If all players decide to stay in, the base-rate probabilities for being expelled vary by round: 1/6 for round 1; 1/5 for round 2; 1/4 for round 3; 1/3 for round 4; and ½ for round 5 (last column in Table 1). These probabilities can be used to find the expected number of withdrawals (lower panel of Table 1). All in all, if players were correctly calibrated, there should be one player deciding to exit each round, so that there would be 36 exits per round in 36 regular games, and 6 exits per round in 6 Sunday games.

In fact, in the 36 regular games generally too few people chose to exit, e.g., only 9 and 23 in rounds 1 and 2. Across all rounds of the regular games, there were 108 decisions to withdraw, while the expected number of withdrawals is 180. However, in the 6 Sunday games, participants attempted to exit the game more often than the base-rate probabilities suggest: there were 42 decisions to exit against 30 expected exits. One

explanation for the apparent increase in risk aversion is that accumulated gains were much larger in Sunday as opposed to the regular games (details are provided further below). In addition, on the Sundays contestants were playing the game for a second time and knew that they were facing other winners of regular games.

Winners. Twenty-five men and 11 women won in the 36 regular games. Of these, 5 men and 1 woman won in Sunday games.

The future winners-to-be already did better than other contestants in the first rounds of regular games. Table 2 details the gains of the eventual winners and other players in the five rounds of regular games. The advantage of performing well early in the game is demonstrated by the fact that the difference between the payoffs of the eventual winners and others is statistically significant for all but the fourth rounds.[8]

Insert Table 2 and Figure 1 about here

We next report our main gender-specific results.

Result 1: *There is a significant gender gap in earnings.*

Women earned significantly less than men: mean earnings were 3,390 USD for men and 1,756 USD for women (52% relative to men).[9] The maximum earnings among women were 23,550 USD (79% of the male maximum). The median earnings among men were also significantly larger: 936 USD for men vs. 375 USD for women (40% relative to the men's median).

Result 2: *The proportion of women decreases significantly at later stages of the game.*

Of the 216 contestants in regular games, 102 were female (47%). Figure 1 shows that the proportion of female contestants decreased dramatically as the game

[8] This difference is particularly striking when it is recalled that payment for correct answers increased by 75 USD each round.
[9] The difference is statistically significant, Wilcoxon rank-sum test $z = 2.29$, $p = 0.02$, $n = 216$.

advanced. That is, in the last round of regular games, 50 of 72 contestants were males (69%). In the last round of Sunday games, there were ten men (83%) and two women. (In the final game, one woman competed against five men, and in the very last round two men disputed the title of "winner.")

We next analyze possible reasons for the decreasing female/male ratio among contestants. First, it is possible that women were forced out earlier than men from the game due to inferior performance. Second, it is possible that more women withdrew voluntarily from the game than men.

Result 3: *In regular games, more women are expelled than men.*

We first analyzed performance across rounds at the individual level. Specifically, for every contestant, we averaged across rounds of regular and Sunday games the percentage of questions s/he answered correctly – see Figure 2. Median individual performance was 57.6% for men and 51.4% for women; mean individual performance was 56.0% and 50.5%, respectively; the difference between the means is statistically significant (Wilcoxon rank-sum test, $z = 2.395$ $p = 0.003$, $n = 216$)[10]. In addition, the range of individual performance was greater for women than men. The percentage of questions answered correctly by the worst individual performer was 12.5% among women and 25% among men. The best individual performances for women and men were, respectively, 77.5% and 81.9% correct answers.

Insert Figure 2 about here

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[10] In the first round of regular games, both men and women did better than on average across the rounds. In particular, in these rounds, median performance was 75.0% for men and 62.5% for women; mean individual performance was 69.8% and 63.8%, respectively; the difference between the means is statistically significant (Wilcoxon rank-sum test, $z = 2.338$ $p = 0.019$, $n = 216$).

There are at least two possible explanations for the differential ability of men and women in answering the questions. First, women might suffer more anxiety from performing in public (Larkin & Pines, 2003). In our situation, this hypothesis is less plausible when one recalls that both men and women volunteered to participate in the competition. Nonetheless, it is still possible that women were less comfortable with the public dimension of the game than the men. Second, the questions could have had some gender bias. However, as noted above, the questions covered a wide variety of topics and we were not able to detect any bias.

We next analyzed the data on expulsions. Across all games, 47 women and 43 men who had the lowest performance at the end of rounds were expelled from the game. Figure 3 illustrates the percentage of expelled contestants by game and round, separately for males and females. The percentage of expelled contestants is larger for women than men in the first four rounds of the regular game. Gains that male and female contestants accumulated at the end of each round (before any expulsion was made effective) confirm the pattern of expulsions (Table 3). Female contestants had lower accumulated gains than male contestants in all rounds of regular games. However, in Sunday games there was no significant difference between the accumulated gains of men and women who remained in the game.

Insert Figure 3 and Table 3 about here

Result 4: *The rate of voluntary withdrawals is larger for women than for equally skilled men.*

Across all games, 68 women and 87 men decided to leave the game voluntarily. Figure 4 shows the rates of withdrawals (both resulting and not resulting in actual exits) by gender, game, and round. The proportion of contestants who voluntarily withdraw

from the game is consistently larger among females. Moreover, the gap increases in Sunday games. In regular games, 6% of female as opposed to 3% of male contestants decided to withdraw from the first round. The withdrawal rate increased to 12% among men and 23% among women in the third round, and to 28% among men and 36% among women in the last round. In Sunday games, 32% of men vs. 64% of women decided to leave the game in the first round and 30% of men vs. 50% of women in the last round.

Insert Figure 4 about here

Did women exit the game voluntarily because, having accumulated less gains than men, they anticipated the risk of being expelled? To answer this question, we fitted a population-averaged logistic model of exit decisions (made in regular and Sunday games) with two predictors: gender (female coded as 1) and accumulated gains at the moment of the decision[11]. Standard errors were adjusted for the correlation across repeated observations. The model showed that the marginal effect of gender was statistically significant. The probability of withdrawal was 6.9 percentage points larger for women than men ($p = 0.02$). In addition, this model showed that for each additional 1,000 USD of accumulated gains the probability of withdrawal was 2.2 percentage points larger ($p<0.001$). Figure 5 depicts predicted probabilities of withdrawal as a function of accumulated gains, separately for men and women. The results from the logistic model are presented in Table 4 (Model 1).

[11] The estimates of population-averaged (or marginal) specifications are interpreted as group differences, i.e., as effects on the average person (Diggle et al., 2004). Since we are interested in how exit decisions differed between men and women, these specifications seem more appropriate than alternative random-effect specifications. Although the latter have the advantage of accounting for natural heterogeneity among subjects in terms of unmeasured characteristics, their estimates are interpreted as within-subject effects and thus seem less appropriate to assess the effect of gender. We nevertheless checked the results of random-effect specifications: these yielded worse fit (as evidenced by lower χ^2), but qualitatively the same results (not reported here).

Adding indicator variables for rounds and the type of game (regular vs. Sunday) does not change the effect of gender on withdrawals (Model 2 in Table 4 [12]).

Insert Figure 5 and Tables 4 and 5 about here

We next classified all withdrawals as correct or incorrect decisions. The decision was correct if a contestant was indeed ranked last and thus would be expelled. Incorrect decisions were premature withdrawals, i.e., taken by contestants who are not ranked last in a given round. Across all games, there were 72 correct and 83 incorrect withdrawal decisions. Among women who decided to exit the game, 30 did so correctly while 38 took incorrect decisions to exit. As for men who decided to leave the game voluntarily, 42 were right in doing so, while 45 decided to abandon the game prematurely. These data, along with the number of withdrawals resulting in actual exists are summarized in Table 5. The data on expulsions are also added for reference.

To understand the effect of gender on correct vs. incorrect decisions to withdraw, we fit separate logistic models of correct and incorrect exit decisions in regular and Sunday games with gender and accumulated gain as predictors (population-averaged models, standard errors adjusted for repeated observations). The results from the models are presented in Table 4 (Models 3 and 4). The models show that the probability of correctly withdrawing from the game was the same for men and women with the same accumulated gains ($p = 0.44$). On the other hand, the probability of incorrect withdrawals was 5 percentage points higher for women than men ($p = 0.03$).

[12] The marginal effects of all indicators are positive and significant, in line with the fact that there were more withdrawals in later rounds and in Sunday as opposed to regular games. The negative marginal effect of accumulated gains in this model suggests that within each round, contestants with larger accumulated gains were less likely to withdraw – 12 percentage points less for each additional 1,000 USD of accumulated gains.

Result 5: *Incorrect withdrawals among women increase when the proportion of women in the group decreases.*

We next analyzed how gender composition of groups affected contestants' decisions to withdraw. For each group and round, we coded the proportion of female contestants in the group. For example, for a group with 2 women and 3 men the new variable was coded as 2/5 = 0.4. We next included this new variable and the interaction between the proportion of women and the indicator for female in the logit models of incorrect exits. The results are presented in Table 4 – see Models 5 and 6 (Model 6 includes additionally indicator variables for round and the type of game – regular vs. Sunday).

The interaction term significantly improved the goodness of fit of the models, adding 31% and 23% to the χ^2 of Models 5 and 6 respectively ($p<0.01$ for both)[13]. The results of the models show that when deciding to withdraw, women but not men are sensitive to the gender composition of groups. The probability of women prematurely leaving the game is larger when the relative number of women in the group is smaller. Figure 6 depicts the predicted probabilities of incorrect withdrawals for men and women (as implied by Model 5), as a function of the proportion of women in the group at the moment of the decision to exit. When 70% of the group is composed of women, the probability of incorrect withdrawal is the same for women and men – about 0.09 or 9%. When there are 20% women in a group, the probability of voluntary premature withdrawal by a woman is 0.19. When there are 40% women in the group, the probability of incorrect exit is 0.14, a decrease of 0.05. The probability of incorrect withdrawal further drops to 0.10 for a woman making decisions in a group with 60% women, a decrease of 0.04.

[13] The p-value for the coefficient of the interaction term was 0.07 in Model 5 and 0.03 in Model 6.

As to men, the probability of exiting the game increases as the proportion of women in the group increases. However, the effect is not as strong as that for women. Indeed, logistic models similar to Model 6 fit separately on the data corresponding to men and women confirmed that men's incorrect decisions to exit did not vary with the gender composition of groups ($p = 0.15$), while women exited more when the proportion of men in the group increased ($p = 0.04$)[14].

Insert Figure 6 about here

Interestingly, adding the proportion of women and the interaction term to the model of incorrect exits does not cancel the direct effect of gender: the indicator for female is positive and significant in both Models 5 and 6 ($p<0.01$ in both models), suggesting that women were overall more likely to withdraw incorrectly than men.

One possible explanation for women exiting more when faced with the prospect of competing against relatively more men is that they generally perform worse in such circumstances. Thus, anticipating this, they prefer to withdraw. To test this hypothesis, we analyzed whether group composition affected performance, i.e., the number of correctly answered questions, of men and/or women. Specifically, we fitted population-averaged linear models of the number of correct answers separately for men and women. Standard errors were corrected for multiple observations on individuals. The independent variable was the gender composition of the group (measured as the proportion of women). In addition, the models also controlled for the type of game (regular vs. Sunday) and round (four indicator variables for rounds 2-5). The models revealed that women indeed performed better in groups with more female contestants:

[14] For each group and round except the first rounds, we also coded indicator variables of whether in the previous round a woman (1) decided to leave the game voluntarily; and (2) was expelled from the game. Further analyses of logistic models revealed that these variables could not account for the women's withdrawal behavior. That is, we did not find any evidence of women mimicking the behavior of their female peers in the previous rounds.

for each additional 20% of women in the group, women's performance increased by, on average, 0.2 correctly answered questions ($z = 2.11$, $p = 0.04$, 333 observations, $n = 102$, $\chi^2(6) = 334.36$). By contrast, men's performance did not differ in groups with differential gender ratios ($z = 0.76$, $p = 0.45$, 507 observations, $n = 114$, $\chi^2(6) = 277.08$).

How symmetric is the effect of gender ratio on women's behavior? We have found that women who decided incorrectly to withdraw from the game did so more when the gender ratio was skewed toward men in their groups. Could a similar argument be made about women who incorrectly decided to stay in the game and consequentially were expelled? Does the probability of women being expelled increase with the proportion of women in the group? To answer this question, we focused on the data on expulsions and correct exits, and fitted a logistic model, similar to those presented above, with the dependent variable "expulsion." The results are presented in Table 4 – Model 7. Neither the gender ratio nor the interaction between gender (female = 1) and the gender ratio are significant in this model ($p = 0.16$ and 0.46, respectively). Thus, the effect of group composition is not symmetric in our data and only applies to women who perform relatively well and yet still decide to leave the game – and especially when competing against fewer women than men.

Result 6: *Female winners-to-be are as active in the interactions as male contestants.*

Our more qualitative data revealed that female contestants engaged less in strategic end-of-round interactions (women were "very vocal" in 43% of the interactions versus 59% for men; proportion test $z = 3.17$, $p<0.01$). However, female winners-to-be were as active in the interactions as male contestants. In particular, female winners-to-be were especially active in 67% of the interactions of the regular games (versus 37% for female non-winners; proportion test $z = -3.09$, $p<0.01$), while

male future winners were very active in 58% of the interactions (versus 60% for male non-winners; proportion test z =0.20, *ns*).[15]

This behavioral difference between female winners-to-be and non-winners contributed to the overall difference between winners-to-be and non-winners. In particular, across both genders, future winners were more active in the end-of-round interactions of the regular games. Winners-to-be talked "a lot" in 61% of the interactions compared to 49% for other contestants (proportion test z = - 2.06, $p<0.05$).

As to persuading others to withdraw from the game, male contestants employed this strategy marginally more than their female counterparts – in 10% vs. 6% of the interactions. The difference, however, is not statistically significant (proportion test z = 0.60, *ns*). Within-gender comparisons showed that winners-to-be did not use this strategy more than less successful contestants across rounds.

We next examined whether the contestants were similarly vocal in the groups differing by gender composition. We fitted logistic models analogous to those presented above with the dependent variable "very vocal" (0/1). The predictors were gender (1 for female), the proportion of women in the group, and the interaction term between these two variables. None of the predictors was significant in this model (all $p>0.10$, 840 observations, n =216, $\chi^2(3) = 14.85$). Thus, the gender ratio did not affect the contestants' propensity to be active in the post-round interactions.[16]

[15] The difference between 67% for female winners-to-be and 59% for all male contestants is not statistically significant (proportion test z = 0.92, *ns*).

[16] We also analyzed whether the contestants' decisions to leave the game were affected by how vocal their competitors were. For this effect, for each group, round, and participant we coded the number of very vocal players, excluding self. In addition, we coded separately the number of very vocal men and women (again, excluding self). We analyzed the effect of these variables in the logistic models of exit similar to those presented in Table 4. Across various specifications, none of these variables had any predictive power to explain either correct or incorrect exits, or women's or men's decisions. Strategic posturing in this game was not persuasive enough to modify the behavior of competitors.

General Discussion

The analysis of the game show data clearly rejects the null hypothesis of no gender effects across rounds of the game. Noting that the game starts with approximately the same number of males and females, we find, first, that men earn 40% more than women (median comparison); and second, women exit the game, on average, faster than men. Moreover, whereas this can be explained partly by a performance difference, women also exit voluntarily more than men. In fact, the probability of voluntary withdrawal is 6.9 percentage points larger for women than for equally skilled men (as measured by accumulated gains). Importantly, women leave the game too soon more when the proportion of women in their groups decreases. By contrast, men's decisions to stay or leave are not affected by the gender composition of the groups.

At a qualitative level, winning contestants engaged in more strategic bantering (to persuade others to quit) and men tended to do this more than women. In addition, while women engaged overall less in strategic end-of-round interactions, female winners-to-be were as active in the interactions as male contestants. This suggests, therefore, that those women who won regular games became a self-selecting group who behaved more like men. Reasons could include effects of positive experience with the task such as reduced risk-aversion,[17] increased self-confidence, or greater comfort at performing in public. All in all, the "glass ceilings" we observed were not inevitable.

One way to interpret the game is as a metaphor for executives climbing a corporate hierarchy where promotions depend on both relative ability and the willingness to compete with others. At the outset, the corporation recruits approximately the same number of male and female executives of equal ability. Periodically, these executives receive information about their performance and must

[17] In a laboratory study, Gysler, Kruse, and Schubert (2002) found that risk aversion of women in a financial context diminished with experience.

decide whether this justifies continuing. In other words, the rounds of the game are similar to levels in a corporation where workers have to decide whether to withdraw from competing with their peers or to attempt to climb further. And, similar to life in corporations, if the "weak" don't choose to leave, they are eliminated. At the same time, as in corporate life, the game allows for strategic posturing by competitors.

However, the game differs crucially in one respect from its corporate counterpart. There is no equivalent for gender-specific "constraints" such as child rearing for female participants. That is, in the game women don't differ from men in having an alternative option to pursue. This difference is critical because it means that the glass ceiling we observed cannot be explained by women choosing to pursue a specific, alternative activity.

Our results help to explain gender-specific outcomes in the labor market and suggest that one reason for "glass ceilings" lies in women's own behavior – they abandon competitive environments too soon. Importantly, our results show that antidiscrimination policy is not sufficient to close the gender gap. A gender gap appeared even in the non-structured context of a TV game show.

It is tempting to suggest that our results simply reflect greater risk aversion on the part of women. Indeed, a large literature documents that in many domains of risk taking women are more risk averse than men (Croson & Gneezy, 2009). However, these differences tend to disappear when account is taken of profession, knowledge, and experience (Dwyer, Gilkeson, & List, 2002). For example, no gender differences in risk attitudes were found among entrepreneurs (Birley, 1989), fixed-income mutual fund managers (Atkinson, Baird, & Frye, 2003), managers of large companies (Adams & Funk, 2009), and people undergoing managerial education (Johnson & Powell, 1994).

Self-selection and experience are the most likely explanations for these exceptions (Croson & Gneezy, 2009).

While differences in risk aversion might have played a role in producing the gender gap in the game, we do not have a measure of the contestants' risk attitudes. However, gender differences in risk attitudes do not explain why women behaved as if they were less risk averse in the groups involving more women and fewer men. Nor do they explain why men were more active than women in interactions between competitors, and at the same time female-winners-to-be were as active as men. We further note that, in terms of behavior, the participants all self-selected into a competitive game. Moreover all were deemed by the game organizers to be "risk-seeking." Whereas the validity of these latter judgments could be questioned, the whole selection process undoubtedly contributed to reducing variability in risk attitude and thus its ability to discriminate the genders.

In our view, attributing the observed gender gap to greater risk aversion on the part of women is not a satisfactory explanation in that it does not illuminate (a) *why* women are more risk-averse *in these circumstances*, nor (b) what could be done to *change* behavior. To determine the factors that induce glass ceilings and to understand how they might be broken requires going beyond this level of explanation.

For example, the fact that women exited less when there were more women present could perhaps be explained by similarity attraction or the notion that individuals are attracted to and prefer to interact with similar others (Byrne, 1971). In fact, evidence suggests that women are more satisfied with their jobs when they work with more women (Tolbert et al., 1999). For men, other mechanisms such as the thrill of competition, the need to maintain a public image of "winner", etc., might be more powerful than similarity attraction.

The observed gender gap is also consistent with "expectation states" theory. This argues that individuals use status beliefs to organize their interaction in goal-oriented settings (Berger et al., 1977). The theory further claims that gender becomes more salient in settings when it differentiates the actors – i.e., in a mixed-sex context. In such settings, gender status beliefs shape – often unconsciously – expectations for competence and behaviors in a self-fulfilling way (Ridgeway & Smith-Lovin, 1999). In patriarchal societies, beliefs that associate higher status and competence with men than women are widely held (Williams & Best, 1990). As a consequence, gender roles encompass expectations about men being more assertive, and women being more subordinate and less overtly aggressive (Eagly, Wood, & Johannesen-Schmidt, 2004). Thus, even in the context of the game, free of gender differences in hierarchical roles and status relationships, implicit gender status beliefs that participants brought with them might have led men and women to behave in accordance with their status in everyday interactions, thereby ultimately recreating the external gender system.

Also consistent with expectation states theory is the idea that men and women could have different expectations about the game in terms of earnings and that these would affect behavior. That is, if women expected to earn less than men, they would be more motivated to leave the game earlier than men. However, since we do not have a measure of expectations of earnings, we cannot test this hypothesis with our data.

Expectation states theory further predicts that in mixed-sex settings with gender-neutral tasks, performance expectations triggered by gender status beliefs make men participate more, speak up more often, defend their views, and overall display more confident and assertive behavior than women who are otherwise similar to them (Ridgeway, 2001). Low-status members of the group behave in accordance to their status — taking a more reactive role (Wagner & Berger, 1997). Several studies have

shown that, other things being equal, men talk more when performing gender-neutral tasks in mixed-sex groups (e.g., Dovidio, Brown, Heltman, Ellyson, & Keating, 1988). It was also the case in our data: on average, men were more vocal than women in the end-of-round interactions.

Importantly, competence expectations based on gender status assumptions mediate men's tendency to speak more and be more active overall (Wood & Karten, 1986). When competence expectations for men and women are the same, gender differences disappear. In our data, women who performed relatively well in the task (i.e., the future winners) were as active as male participants. We speculate that evidence of competence in the form of performance feedback might have modified the gender status beliefs of these women, thereby reducing their adherence to stereotypical female/low-power behavior.

Drawing parallels between the structure of the game and that of a corporate hierarchy, our results imply that, in such organizations, the advantage of groups (here: male and female) is cumulative in nature. Thus, any female disadvantage in being promoted to the top level (or winning the competition) has its origin in what happens early in the process. For example, in our data both higher rates of expulsion and voluntary exits for women at earlier stages of the game (i.e., at "lower levels" of the hierarchy) meant that, in the competition for the "top spots," women were a minority.

This insight has important ramifications for promoting gender diversity in organizations. In particular, it's no use bemoaning the lack of good female candidates for senior positions. Instead, it is important to commit resources to maintaining and promoting women *at the lower and middle levels* so that the ultimate pool of senior female candidates can be as large as that of men. Importantly, we find that women exit competitive environments less when more women participate in the contest. It is

relative numbers that are important in shaping labor outcomes of disadvantaged groups. The literature on tokens also suggests that women or members of any underrepresented category need to be added to organizations in sufficient numbers to counteract the negative effects and self-fulfilling prophecies of "tokenism" (Kanter, 1977a).

Our work represents an opportunistic attempt to illuminate an important social problem by capitalizing on a "natural experiment." It is therefore appropriate to assess its strengths and weaknesses. On the positive side, we note, first, that all contestants volunteered to participate in what they knew was a competitive game with a strong public dimension. This is not dissimilar to starting to work in a large corporation although, of course, the game involves even wider dissemination of performance data. Second, payoffs were substantial and especially when one considers the amount of time devoted to the game. Third, as noted above, both discrimination and gender-specific constraints can be ruled out as alternative explanations for the behavior observed.

At the same time, the field nature of this natural experiment suggests care in interpreting results. First, there were small differences in ability (as measured by performance) between men and women in the regular games. Whereas we find – controlling statistically – that women still exited the game voluntarily at a higher rate than men, an improved experimental design would have involved equating men and women on a number of dimensions before the games even started. Since we are measuring performance, however, controls should not concern just knowledge about the kinds of questions asked but also comfort levels in terms of answering questions in public.

Second, one can question whether it is possible to generalize from performance on general knowledge questions. Clearly, there is a large inferential jump from general knowledge questions to job performance and, as is well known, jobs can have

characteristics that are gender related or stereotypical (e.g., nursing). A further consideration is the lack of opportunities for learning to improve performance during the game which, once again, might be gender-related for different types of tasks in naturally occurring environments.

All these disadvantages inherent in our research clearly define questions for further investigation using both more focused experimental designs and other field studies. Assuming, however, that our quasi-experimental results are valid, we believe that the critical question for future investigations lies in identifying specific strategies for changing the structure of organizations in order to modify existing gender status beliefs and thus prevent skilful women from imposing their own glass ceilings. To be effective, any affirmative action aimed at increasing the relative number of women in organizations must be combined with attention to status and power relationships (Ridgeway, 2001) – to avoid the spill over effects from the individuals' habitual environments to a discrimination-free organization.

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Table 1: Actual and expected number of withdrawals

Actual number of withdrawals* (Total number of participants)				Base-rate probability for being expelled
Round	Regular games	Sunday games	The Final	
1	9 (216)	15 (36)	1 (6)	0.17
2	23 (180)	8 (30)	2 (5)	0.20
3	24 (144)	8 (24)	1 (4)	0.25
4	30 (108)	7 (18)	1 (3)	0.33
5	22 (72)	4 (12)	0 (2)	0.50
Total	108	42	5	
Expected number of withdrawals				
Per round	36	6	1	
Total	180	30	5	

*including the decisions to withdraw both resulting in actual exits and not

Table 2: Mean accumulated gains to winners-to-be and other players after different rounds in regular games

Round	Winners		Others		z	
	Gains	n	Gains	n		
Regular games						
1	471	36	388	180	-4.07	***
2	913	36	784	144	-3.36	***
3	1,506	36	1,227	108	-2.45	*
4	2,423	36	2,268	72	-1.47	
5	3,631	36	3,244	36	-2.55	*

Notes: z: Two-sample Wilcoxon rank-sum test
*** $p<0.001$; ** $p<0.01$; * $p<0.05$; + $p<0.10$.

Table 3: Mean accumulated gains in regular and Sunday games

Round	Men		Women		z	
	Gains	n	Gains	n		
Regular games						
1	419	114	383	102	2.34	*
2	842	98	772	82	2.22	*
3	1,439	83	1,297	61	2.09	*
4	2,394	71	2,177	37	1.70	+
5	3,659	50	2,935	22	3.42	***
Sunday games						
1	8,481	25	8,339	11	0.96	
2	9,414	23	9,568	7	-0.69	
3	10,512	19	11,130	5	-1.35	
4	12,045	14	11,950	4	0.05	
5	14,650	10	14,825	2	-0.11	

Notes: z: Two-sample Wilcoxon rank-sum test
*** $p<0.001$; ** $p<0.01$; * $p<0.05$; + $p<0.10$.

Table 4: Logistic models of voluntary exits.

Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Exit	Exit	Correct exit	Incorrect exit	Incorrect exit	Incorrect exit	Expulsion (vs. correct exit)
Independent variables:							
Constant	-2.129***	-2.723***	-2.796***	-2.897***	-3.195***	-3.672***	2.156**
	(0.158)	(0.253)	(0.217)	(0.206)	(0.399)	(0.454)	(0.669)
Female (0/1)	0.460*	0.475*	0.220	0.550*	1.721**	1.798**	1.624+
	(0.201)	(0.225)	(0.281)	(0.257)	(0.631)	(0.603)	(0.951)
Accumulated gains, in $1000	0.154***	-0.879***	0.107**	0.136***	0.156***	-0.316+	0.637**
	(0.030)	(0.199)	(0.033)	(0.029)	(0.031)	(0.187)	(0.233)
Sunday game (0/1)		9.482***				4.415**	-7.726***
		(1.807)				(1.690)	(2.323)
Indicator variables for rounds 2-5		Included				Included	Included
Proportion of women					0.685	1.155	-1.776
					(0.934)	(0.884)	(1.254)
Proportion of women*Female					-2.481+	-2.848*	-1.444
					(1.388)	(1.286)	(1.956)
Model χ^2	27.84	90.89	10.16	22.99	33.99	58.61	34.56
Number of observations	840	840	840	840	840	840	158
Number of participants	216	216	216	216	216	216	148

Notes: Population-averaged models were fitted. Standard errors, reported in parentheses, corrected for correlation across repeated observations on individuals. *** p<0.001; ** p<0.01; * p<0.05; + p<0.10.

Table 5: Number of withdrawals and expulsions by gender.

		Men	Women	Total
Winner of the big final game		1	0	1
Expulsions		43	47	90
Decisions to exit:				
	Correct	42	30	72
	Incorrect	45	38	83
	Total	87	68	155
Decisions to exit resulting in actual exits:				
	Correct	37	23	60
	Incorrect	33	32	65
	Total	70	55	125
Total number of contestants		114	102	216

Figure 1: Numbers of men and women in the game

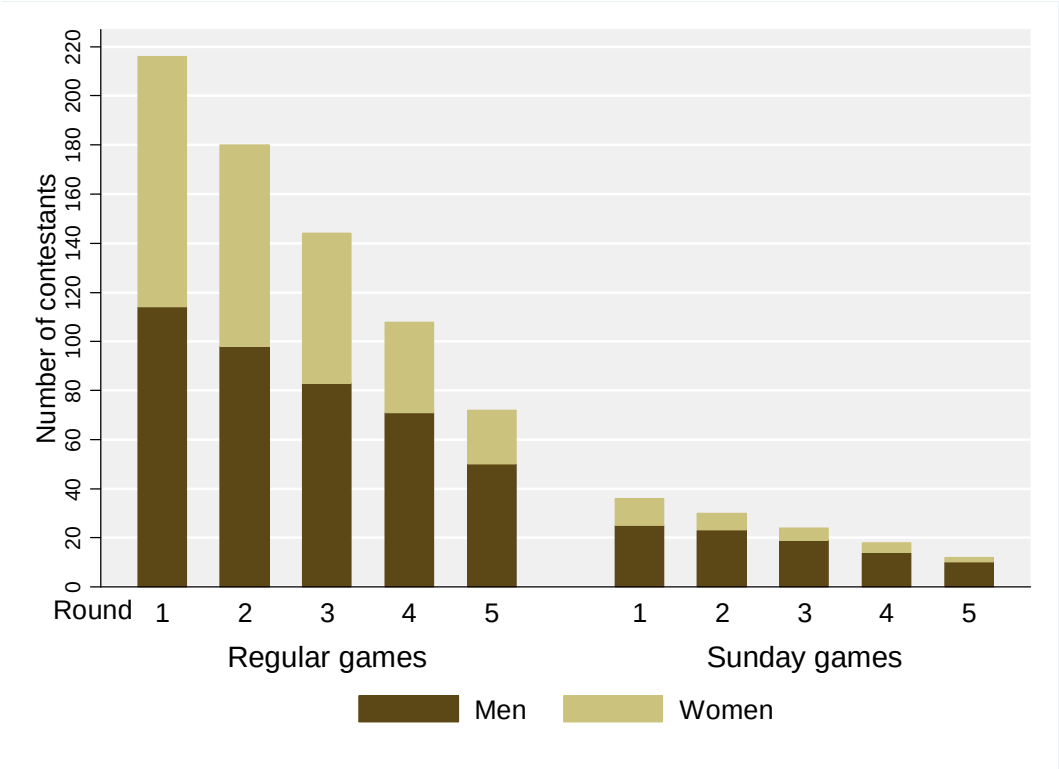


Figure 2: Percentage of correct answers – by gender

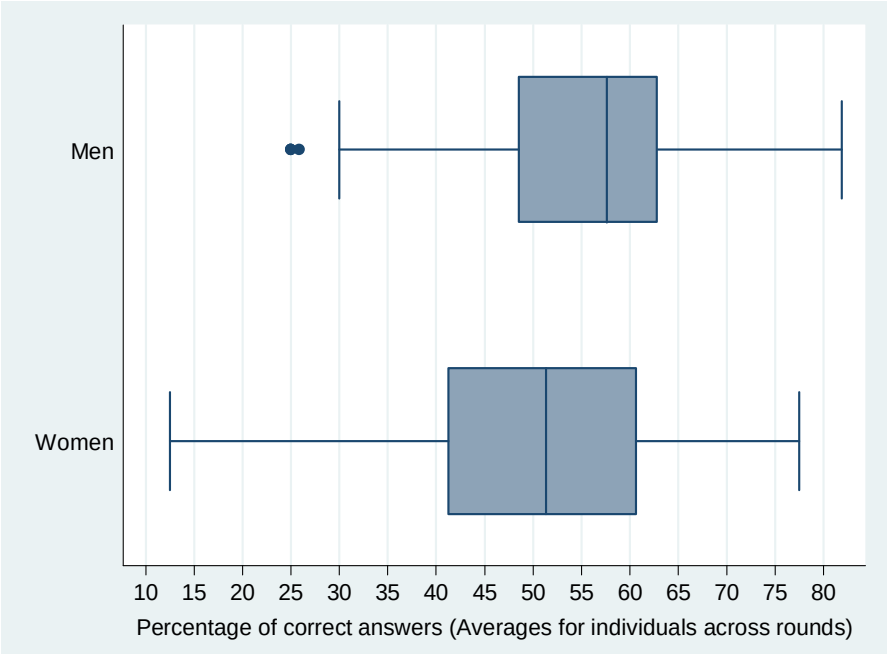


Figure 3: Percentage of contestants expelled from the game – by gender

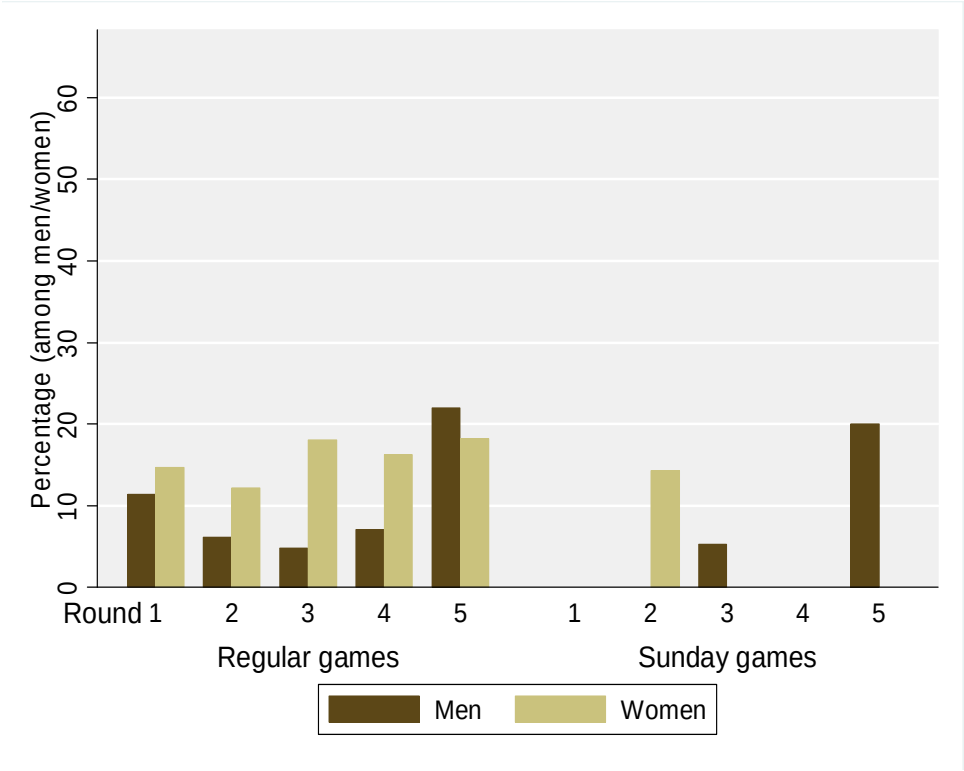


Figure 4: Percentage of contestants who decided to withdraw from the game – by gender

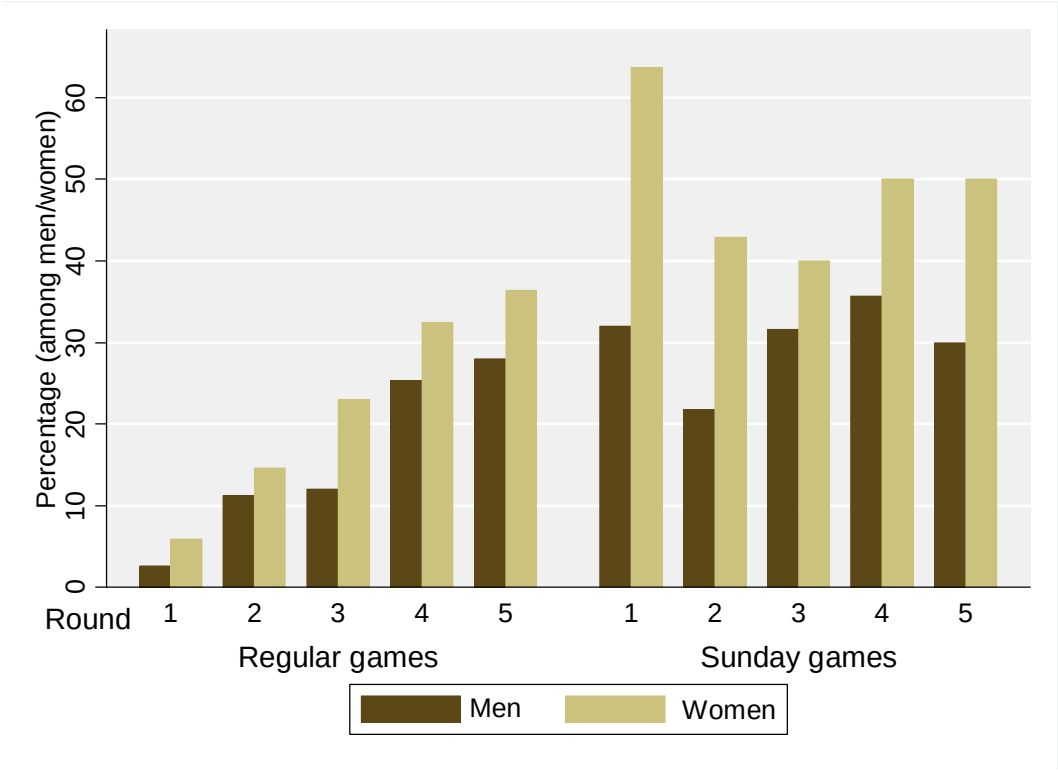
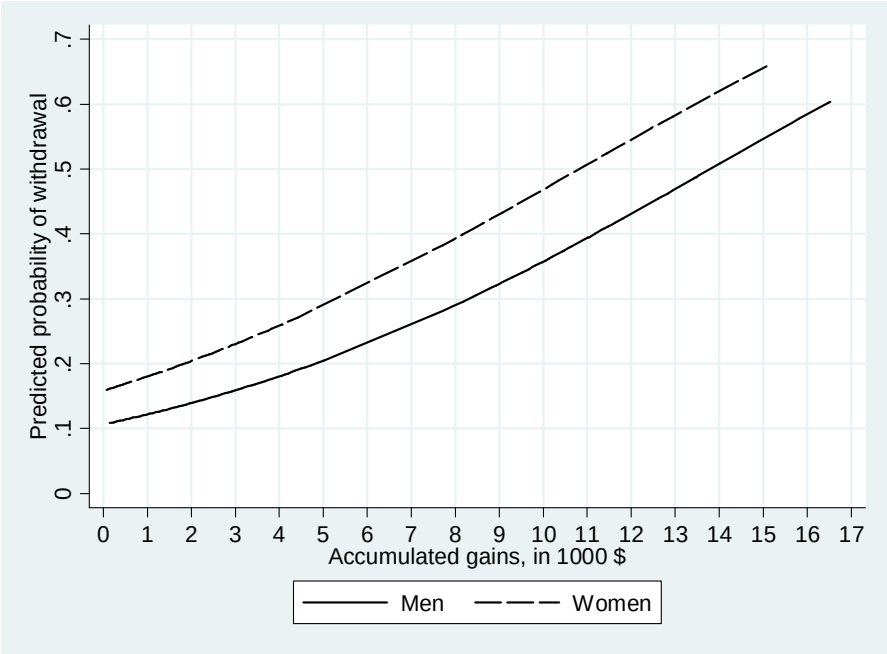
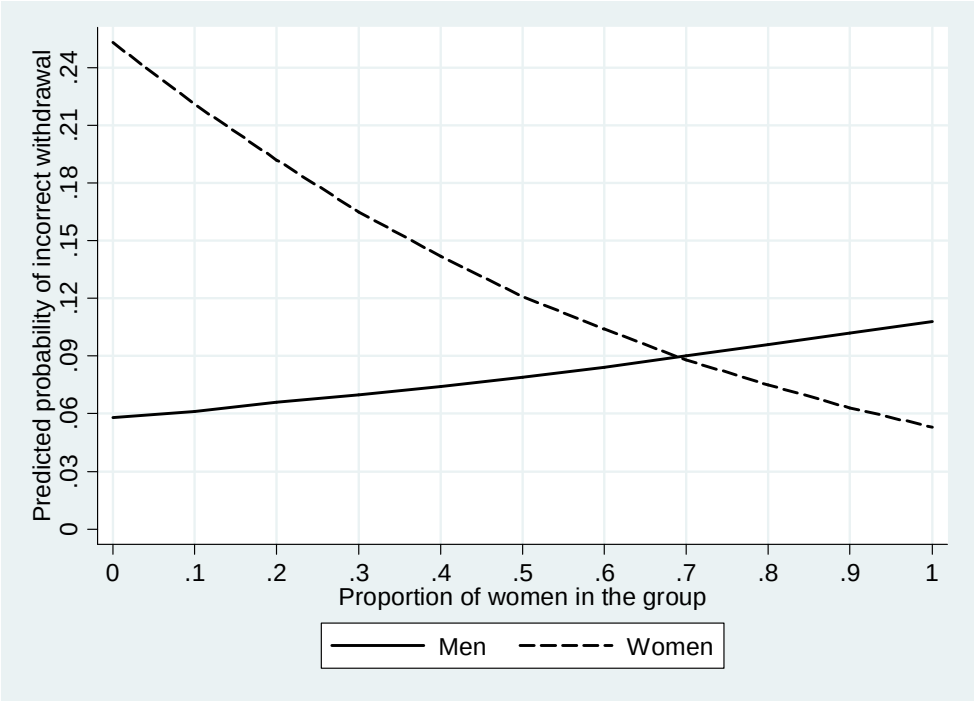


Figure 5: Predicted probabilities of withdrawal – by gender



Note: Plots are based on the results presented in Table 4 (Model 1).

Figure 6: Predicted probabilities of incorrect decision to withdraw – by gender and group composition.



Note: Plots are based on the results presented in Table 4 (Model 5). The probability of withdrawal includes the main effect of gender (0 for men and 1 for women), the intercept between gender and the proportion of women in the group, and the effect of accumulated gains, estimated at its mean level.

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