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She Could Not Agree More: The Role of Failure Attribution in Shaping the Gender Gap in Competition Persistence

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Abstract

In competitive and high-reward domains such as corporate leadership and entrepreneurship, women are not only underrepresented but they are also more likely to drop-out after failure. In this study, we conducted a laboratory experiment to investigate the influence of attributing failure to one of the three causal attributions - luck, effort, and ability - on the gender difference in competition persistence. Participants compete in a real effort task and then their success or failure is attributed to one of three causal attributions. We find significant gender differences in competition persistence when failure is attributed to a lack of ability, with women dropping out more. On the contrary, when suggested that failure was due to lack of luck, women's competition persistence after failure increases relative to men. We find no gender difference when failure is attributed to a lack of effort. Our findings have important implications for designing feedback mechanisms to reduce the gender gap in competitive domains.

Keywords: decision analysis; competition; gender gap; performance feedback; laboratory experiment

JEL: C91, D03, M50, J24

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[3] This study has been approved by the UCL Research Ethics Committee (Project ID number: 9287/003).

1. Introduction

Despite the growth in female labor market participation, women remain underrepresented in competitive and high-reward domains such as corporate senior leadership, STEM jobs, innovation, and entrepreneurship. The share of female physicians and financial managers climbed to 41% and 54% respectively in 2019 from 13% and 24% in the mid-70s, yet the share of female CEOs in Fortune 500 is far from these figures hovering at less than 8% (Hinchliffe 2020, Wootton 1997). In such competitive domains, women are not only heavily underrepresented but they are also more likely to drop-out. Women rejected in the recruitment process for senior executive roles in the past are less likely to consider another position in the same firm relative to men (Brands and Fernandez-Mateo 2017). In entrepreneurship, the odds of reentry after a business failure of the already underrepresented female entrepreneurs are significantly lower compared to their male counterparts (Simmons et al. 2019). Also besides the fact that only 8% of all patents had a woman as the primary inventor, teams led by women are 4%-7% less likely to continue the patent process after an early rejection (Aneja et al. 2020). Failure and setbacks are organic and fundamental elements of these competitive domains, thus, the endurance of setbacks and persistence in competing are keys to “make it” in these domains. Be it successfully receiving an offer for an executive position after a series of interviews, establishing a successful business after multiple entrepreneurial exits, securing venture capital for a start-up after many failed fundraising attempts, being awarded a patent after appealing to rejected categories and negotiating patent rights, winning a grant for scientific research after several rejections, or publishing an academic paper after a series of rejections, reviews, and revisions.

In this study, we examine the impact of failure and failure attribution on men and women’s persistence in competition. We unfold the gender differences in the impact of losing a competition and attributing the loss to one of the three causal attributions - luck, effort, and ability - on the subsequent willingness to compete. To address our research question, we

conduct a laboratory experiment, with 667 subjects. In the experiment, subjects perform a real effort task of calculating the sum of five two-digit numbers in two rounds. In two rounds, subjects choose their compensation scheme of either to receive a piece-rate payment or enter a winner-takes-all competition. The performance of subjects of both compensation schemes is compared to the performance of a randomly matched opponent from the same compensation scheme. A hypothetical, in the case of the piece rate, or an actual, in the case of the competition, win or a loss is then announced to the participants. Conditional on the score, winning and losing can be seen as exogenous. Participants then decide whether they want to compete or work for a piece rate in the next round. Our design builds on the experiment in Buser and Yuan (2019). In their design, participants only receive objective performance feedback about whether they won or lost before they can decide to compete again. This specification is identical to our control group. In our experiment, we add three treatments in which we randomly assigned casual attribution statements that attribute the win/loss to either luck, effort, or ability.

Several interesting findings emerge that contribute to our understanding of the gender differences in competition persistence and how such differences might shape the gender differences in career choices and labor market participation. First, confirming previous findings in the literature, we find that losing a competition, which entitles learning about absolute and relative performance only, has a significant negative effect on subsequent willingness to compete. This negative effect of losing is experienced by both those who have initial preferences for competition and those who do not have such preferences. Second, looking at those who have initial competition preferences, we find no significant gender difference in the effect of losing and receiving performance feedback on the subsequent willingness to compete. Compared to their male counterparts, females, who chose to compete, are as likely to compete again after losing and learning about their performance. These findings are inconsistent with the recent work of Buser and Yuan (2019), which suggests that losing a competition negatively influence females' subsequent willingness to compete. Third,

for those who have initial competition preferences, there are significant gender differences in the effect of attributing a loss to a lack of luck and ability. Compared to males, females are more likely to compete if their loss is attributed to a lack of luck. On the contrary, females are significantly less likely to compete after losing if their loss is attributed to a lack of ability relative to their male counterparts. Fourth, for those who have initial competition preferences, there are no gender differences in the effect of effort attribution. Females are just as likely as males to compete after losing when their loss is attributed to a lack of effort. Fifth, we find that for women attributing failure to lack of luck has no significant effect on their *confidence (beliefs)* while still having a significant positive effect on their *re-entry into competition (action)*, while attributing it to lack of ability has both an effect on beliefs and actions. Finally, the significant gender differences in the effect of luck and ability loss attributions are especially pronounced on highly confident (top 25^{th} percentile) and high in ability (above median) individuals who choose to compete in the initial round. These findings highlight how an individual's reactions to negative feedback can be strongly affected by the way the negative feedback is attributed regardless of how accurate and reliable the feedback is. In our study, ability was purposely ambiguously measured via a task that required ability, effort, and some luck. Further, the feedback was given by a faceless computer. Yet it led to significant changes in behavior. Interestingly, ability attribution only had an effect after a loss, not after winning. This result signals the role of vulnerability in receiving negative feedback and hints at possible pre-existing internal self-attribution of failure among women. These findings may have important implications for workplaces and educational settings in which negative feedback needs to be communicated to individuals by managers, teachers, and superiors. By emphasizing objective performance measures, the role of luck, or the role of effort in an individual's failures, rather than the role of ability, some of the gender gap in persistence after a failure might be alleviated.

Although the literature has empirically addressed the issue of women's persistence in multiple competitive environments such as patenting (Aneja et al. 2020) and entrepreneurial crowdfunding (Kuppuswamy and Mollick 2016), to our knowledge,

experimental analysis of competition preferences and persistence after a failure has been only addressed before by Buser (2016) and Buser and Yuan (2019). Buser and Yuan (2019) investigated the gender differences in the subsequent willingness to compete after losing in a lab experiment and using field data and found that women are less likely to select themselves into a competition again after experiencing a loss. Unlike in observational data settings, our experimental design, like Buser and Yuan (2019), allows us to elicit beliefs and exert control by exclusively manipulating the competition outcomes and attributional feedback while holding everything else constant including the domain's masculinity, opponents' gender visibility, and visibility of failure. Furthermore, unlike other experiments, where all subjects are forced to enter the competition, our experiment is designed to mimic the reality of competition entry by enabling both males and females to make a decision that reflects their true initial competition preferences. This design allows for greater external validity for situations in which individuals self-select into competitive environments. Therefore, our results can contribute to designing better policies that aim to achieve gender equality in labor participation.

Our work contributes to several strands of the literature. First, this paper builds on and extends the gender gap in competition preferences literature, which examines the gender differences in competition preferences and the underlying mechanisms shaping these preferences. The literature suggests that there are gender differences in competition entry where women are less willing to enter competitive environments relative to men (e.g., Croson & Gneezy, 2009; Niederle & Vesterlund, 2007, 2011), which account for a significant proportion of the gender gap in career choice (Buser et al. 2014). It also addresses the age origin of this gap (Sutter and Glätzle-Rützler 2015) and the role of socioeconomic background in shaping the competition preferences among men and women (Almås et al. 2016). Second, this work speaks to the established performance feedback literature and the growing literature on the gender gap in competition persistence. The literature provides evidence that there are gender differences in processing performance feedback and belief updating, however, the evidence is inconsistent about the impact of such differences in competition preferences

(Berlin and Dargnies 2016, Buser et al. 2018). While Cason, Masters, and Sheremeta's (2010) shows that prior knowledge about relative performance does not eliminate the gender gap in the competition entry, Wozniak, Harbaugh, and Mayr's (2014) claims that such feedback has a significant effect on closing that gap. Moreover, the literature claims that negative performance feedback has an impact on, first, the subsequent willingness to seek challenges, where losers seek more challenging targets (Buser 2016) second, women's subsequent willingness to compete again, where they are more likely to drop out relative to men (Buser and Yuan 2019). We show no gender differences in competition persistence after receiving negative performance feedback. Second, by showing how attributional feedback using causal attributions of luck, effort, and ability (Weiner 1985, Weiner et al. 1987) plays a significant role in shaping the gender difference in competition persistence, which as a result would shape the gender composition of competitive and high-reward domains, we contribute to the attribution literature. Third, this study is also related to the growing body of work which examines whether preferences and skills are malleable (Alan et al. 2012; Heckman and Kautz 2014; Alan, Boneva and Ertac 2015; Kosse et al. 2016; Alan and Ertac forthcoming). Andersen et al. (2012) provide compelling evidence from matrilineal and patriarchal societies that socialization at a young age plays an important role in shaping competitiveness preferences. In recent work, Alan and Ertac (2017) show that exposing students to a grit intervention, which emphasizes the role of effort in achievement can mitigate the gender gap in competitiveness. We show that a seemingly small intervention in which we randomize the way the negative feedback is conveyed can have sizeable impacts on individual behavior and the gender gap in competitiveness. Finally, this paper contributes to the understanding of how beliefs map into actions (Barron and Gravert 2020, Costa-Gomes and Weizsäcker 2008, Duffy and Tavits 2008, Settele 2020).

The remainder of this paper is structured into five sections. Section 2 introduces the related literature on women's underrepresentation in competitive domains and gender differences in competition preferences. Section 3 illustrates the experimental design and

general procedure. Section 4 introduces the data. Section 5 reports the results. Section 6 discusses the study findings and implications. Finally, Section 7 summarizes the study conclusions.

2. Related Literature

The literature's sustained interest in the phenomenon of women's underrepresentation in domains associated with high-competition and high-reward highlights the persistence of the phenomenon and the yet to be unfolded underlying mechanisms. Women underrepresentation in such domains compared to men are argued to be partially explained by factors and barriers originated from the demand-side actors, such as companies' hiring and promotion practices, stock market investors, venture capital investors in startups, and colleagues and team members, as well as from the supply side in terms of preferences for competition and beliefs.

On the demand side, preferences, and unconscious bias, as well as outright discrimination by organizations, have been investigated the most. The literature provides evidence that organizations exhibit gender preferences in the hiring processes and promotion practices, where women are often at a disadvantage (Barnett et al. 2000, Fernandez-Mateo and King 2011). Companies that increase women's representation in their boards are penalized by the stock market via a drop in their market value (Solal & Snellman, 2019). Venture capital investors not only ask female entrepreneurs different types of questions during a startup pitch and prefer pitches presented by males compared to identical ones presented by females, but they also eventually invest less than 3% in startups founded by only women compared to 83% to start-up founded by only men (Brooks, Huang, Kearney, & Murray, n.d.; Kanze, Huang, Conley, & Tory Higgins, 2018; PitchBook, 2019). Team members, both men and women, are more likely to override women's opinions when vocalized, which highlights female-specific challenges within an organization that negatively influence talent recognition

and career advancement (Guo and Recalde 2020). To counteract these institutional drawbacks, several initiatives have been put in place and evaluated. Examples are the promotion of voluntary gender targets for the expected percentage of leadership positions occupied by women and the introduction of legislated gender quotas for corporate boards (Klettner, Clarke, & Boersma, 2016; Meier & Lombardo, 2013). The entrepreneurial domain shows the establishment of women-focused incubators and accelerator programs to support female entrepreneurs via training, mentorship, funding, and networking. Nevertheless, the dilemma of women's underrepresentation persists despite the increase in women's entry into these fields.

On the supply-side, the literature has investigated the importance of preferences and beliefs on women's underrepresentation. Te experimental economics literature has largely established that women are significantly less willing to compete compared to men (see among others, Croson & Gneezy, 2009; Niederle & Vesterlund, 2007). This documented gender gap in competition preferences has been shown by a growing body of work to be relevant for labor market outcomes by predicting career choices and partially explained by individual's confidence and risk attitude (Bertrand, 2011; Buser et al., 2014; Niederle & Vesterlund, 2007; Reuben, Wiswall, & Zafar, 2017). Building on the initial literature on competitive preferences, several studies investigated the role of success and failure in shaping the subsequent likelihood to persist and compete again. Combining a survey, field, and experimental data, Brands and Fernandez-Mateo's (2017) shows that rejection in the executive recruitment process negatively influences women's subsequent willingness to compete by triggering their belonging uncertainty and confirming their lack of belonging to this domain. More recently, Buser and Yuan's (2019) addressed this phenomenon in a laboratory experiment and using field data from the Dutch Math Olympiad. They investigated the gender differences in the individual's willingness to compete after losing in a competition. They found that women are less likely to select themselves into a competition again after experiencing a loss. This negative impact of loss is not explained by

gender differences in risk attitude or initial or updated beliefs about the competition outcome, but by a change in women's preference for competition. The Dutch Math Olympiad field data also shows that not only there is a negative effect of experiencing loss on girls' willingness to compete but also the effect persists for a long-term period. These findings highlight the evolving and cumulative nature of the gender gap in competitive domains and that a win or loss is not merely an absolute outcome, but it also serves as a tool or a signal to communicate information about ability.

In addition to differences in preferences, differences in beliefs, and belief updating can be highly influential in gender differences in outcomes. Processing information and belief updating about own ability exhibit have been shown to be prone to several biases. These biases can lead to costly economic decisions, such as over-confident CEOs overestimating their ability to generate returns leading to costly decisions of overinvestment of internal funds and overpaying for the acquired company (Malmendier and Tate 2005, 2008). There is also evidence that high-ability managers are reluctant to correct strategic decisions made by them when internal information and measures indicate that they seem to be failing (Sliwka 2007). According to Mobius et al. (2014), individuals exhibit two types of biases in feedback interpretations. First, they are asymmetric in updating existing beliefs in response to feedback, where they over-weigh positive feedback relative to negative. Second, they are conservative in updating existing beliefs in response to both positive and negative feedback. They also document gender differences in belief updating biases, where women are more conservative than men in response to all feedback. Such a difference lead high-ability women to be underconfident as a result of conservatively updating their belief in response to positive feedback, which could explain the gender gap in entry and persistence in competitive domains.

Taken together, we do not yet know why women, especially those who have shown an initial preference for competition, by entering highly competitive domains are more

likely to drop-out after experiencing failure or a setback and how we can design institutional mechanisms that reduce the drop-out rate of highly qualified women.

3. The Experiment

3.1 Experimental Design and Procedure

In this section, we first introduce the experimental design and procedure and then discuss the employed treatments. Our experimental design is based on Niederle and Vesterlund (2007) and Buser and Yuan (2019). Participants earn money based on their performance in a real effort task of adding up sets of five two-digit numbers. The real effort task is selected intentionally as it has a component of luck, effort, and ability. Luck lies in the random combination of numbers and the random assignment of opponents. Effort lies in the time and attempts invested in performing the task. Finally, the ability component in the selected task lies in the skill to quickly add up numbers. The experiment was created in z-Tree (Fischbacher 2007) and consists of two rounds. First, participants are presented with instructions and given three minutes to practice the task. After the practice task, they learn about their absolute performance (score), but they receive no feedback on their relative performance. Then, they are informed about the number of participants present in the same session and that they are randomly assigned to an anonymous opponent from the same session. At the beginning of each round, participants decided on the compensation scheme for their performance. They can choose between a noncompetitive piece-rate compensation scheme (PPR), which pays *one* point per correct answer without regards to the performance of the assigned opponent, or a competitive compensation scheme (C), which pays *two* points per correct answer if the participant's score is higher than the opponent's and zero otherwise. In case of a tie, winning or losing is randomly determined. One point is worth 50 Euro cents (50 pence) and one round out of the two rounds is randomly drawn for payment. Randomly selecting one round to be paid out eliminates income effects as a potential confounding factor

and prevents hedging. Enabling subjects to decide about their competition entry, rather than forcing everyone to compete allows us to create a setting that mimics the reality of competition entry, which as a result allows us to obtain more accurate results and draw a more meaningful conclusion about the gender difference in competition persistence. In each round, participants are given three minutes to solve as many sets of five two-digit numbers as they can. In both rounds, the participant's performance is compared to their opponent's performance in round one. This fact is clearly communicated to the participants. After each round, all participants receive feedback on their absolute and relative performance regardless of their compensation scheme choice. In other words, they learn their score (absolute performance) and then whether they have (would have) won or lost against their randomly assigned opponent (relative performance). We denote this type of feedback that includes both absolute and relative performance as "performance feedback". For participants who choose the competitive compensation scheme, the feedback reads "You scored X correct answers. You scored higher (lower) than your opponent. You therefore won (lost) against your opponent.", while for participants who choose the piece rate payment scheme the feedback says "You scored X correct answers. You scored higher (lower) than your opponent. You therefore would have won (lost) against your opponent.".

To investigate how individuals respond to feedback regarding outcome's causal attributions, we provided feedback using the three of the main perceived causes of achievement outcomes presented by Weiner and colleagues (1987) and Weiner (1985) in the psychology literature that are luck, effort, and ability. We denote this second type of feedback as "attributional feedback". In the experiment, subjects are randomized into one of four treatment groups: (i) the Luck Treatment group, (ii) the Effort Treatment group, (iii) the Ability Treatment group, and the (iv) the Control group. While the control group receives no further feedback after the first round of performance feedback, the other three groups see an additional attributional feedback statement that attributes their outcome in round one to luck, ability, or effort. Subjects in each of the three treatment groups view the following statements

in addition to the performance feedback (absolute and relative performance) they receive after completing the task.

Luck Treatment:

”You (would have) lost! You must have been unlucky when solving the task. OR You (would have) won! You must have been lucky when solving the task.”

Ability Treatment:

“You (would have) lost! You must not be that good at this task. OR You (would have) won! You must be good at this task.”

Effort Treatment:

”You (would have) lost! You must not have worked hard solving the task. OR You (would have) won! You must have worked hard solving the task. ”

To summarize, the timeline of the experiment is as follows:

1. Practice round:
    - Perform the task of solving as many sets of five two-digit numbers as they can for three minutes
2. Round One:
    - Predict how one’s own performance in round one will rank compared to other participants’ performance in round one
    - Choose a compensation scheme (piece rate or competitive compensation scheme)
    - Perform the task for three minutes
    - Receive feedback on absolute and relative performance “performance feedback”
    - Receive feedback on outcome attribution “Attributional feedback” (depending on treatment group and except for control group)
3. Round Two:

- Predict how one's own performance in round two will rank compared to other participants' performance in round one
- Choose a compensation scheme (piece rate or competitive compensation scheme)
- Perform the task for three minutes
- Receive feedback on absolute and relative performance "performance feedback"

4. Exit questionnaire

3.2 Measures

Willingness to Compete

We elicited the subject's willingness to compete using a binary choice between a non-competitive piece-rate compensation scheme (PR) and a competitive compensation scheme (C). The non-competitive piece-rate compensation scheme (PR) is based on the subjects' performance alone, where they are paid *one* point per correct answer. On the other hand, the competitive compensation scheme (C) is based on subjects' performance being higher than their anonymous and randomly assigned opponent. They are paid *two* points per correct answer if the participant's score is higher than the opponent's and zero otherwise. Noting that one point is worth 50 Euro cents (50 pence).

Confidence

Confidence measures the subject's perceived chance of winning in each round by calculating the difference between the number of participants in the session and the subject's belief about his/her rank. Before the start of each round, we elicit subjective beliefs about their relative performance in the upcoming round. In particular, we ask subjects to predict how their performance will rank relative to the other participants' performance in round one. In round one, the question reads "*Before we start, we would like you to guess how well you think you will do in comparison to the other participants who are in the lab with you. There are N people in the lab today including yourself. What do you think your rank will be in the upcoming round?". In round two, the question reads: "There are N people in the lab today*

including yourself. What do you think your rank will be in the next round compared to the performance of the other participants in the previous round? Please choose a value between 1 and N, where 1 means that you think your performance will be the best and N means that you think your performance will be the worst". By comparing their performance to their peers' performance in round one in both rounds, subjects do not need to consider how others will react to the feedback they were given. They only need to consider their own performance and whether that led to success or failure. The belief elicitation was incentivized, where a participant received a bonus payment of 2 points if the prediction was within plus-minus one of the actual rank. The variable is calculated as (number of participants per session - Predicted Rank)/(number of participants per session − 1) and range in value from 0 (low) to 1 (high).

Score and Additional Measures

The score is calculated for each round and measured by the number of tasks solved correctly. After the experimental task, participants were asked to fill out a short questionnaire before they received their payments. The questionnaire elicited their perception of the task, their perceived attribution of success and failure as well as several personality traits. We measure impatience, risk willingness, competitiveness, and persistence based on the survey questions by Falk, Becker, Dohmen, Huffman, & Sunde, (2016). For example, to elicit risk willingness, we asked the subjects to answer the following question "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?", using a scale from 0 = (completely unwilling to take risks) to 10 (very willing to take risks). To elicit competitiveness, we asked participants to answer the following question "In general, how competitive do you consider yourself to be?" using a scale from 0 (not competitive at all) to 10 (very competitive). Further, we measured the subjects' optimism, grit, growth mindset, and locus of control. Finally, subjects' sociodemographic and personal characteristics such as age, gender, degree of education, the field of study, and parents' level of education.

4. Data

The laboratory experiment was conducted at the University of Hamburg and University College London. Subjects were recruited via the laboratories' online recruiting websites from a subject pool of students from all faculties. In total, 676 subjects participated in 34 sessions. We excluded 9 subjects with missing gender. This resulted in a total sample of 667 subjects. The number of participants per session ranges from 9 to 30. On average, 22 participants participated in each session. Female subjects account for 56% of the participants in our sample. Participants' average age was 25 years old and around 34% of the sample's field of study is in science and technology. By design, half of the participants were residents of the United Kingdom and half in Germany (see Online Appendix A; online appendices are available as supplemental material at @). Table 1 presents descriptive statistics of average scores in the practice round, average total earnings, average choice and outcomes in round one, and treatment groups for the overall sample (column 1) and separately for each gender (column 2-3). The table also shows p-values from t-tests of the gender difference (column 4). During the practice round of the experiment, subjects solved on average 5 addition problems correctly. Total earnings varied between 5 and 22.5 Euro/GBP and the average total earning was 9.77 Euros/GBP including a 5 Euro/GBP show-up fee. Approximately 37% of the subjects in our sample chose to compete in the first round rather than take the piece rate. On average, subjects solved 6.52 problems correctly, resulting in average earnings of 3.77 Euro/GBP in the first round. Conditional on choosing the competitive compensation scheme in the first round, 41% of all subjects lost the competition and as a result received zero earnings in the round.

[[Insert Table 1 about here]]

The statistical differences between the two genders are consistent with the literature, females in our sample were less likely to be associated with science and technology fields of education (Kahn and Ginther 2017) and were less willing to accept risk (Croson and

Gneezy 2009) (see Online Appendix A). Moreover, Column 4 in Table 1 reports significant gender differences in average choices and outcomes. On average, females' total earnings were significantly lower by 1 Euro/GBP relative to their male counterparts. Compared to males, females on average scored significantly lower in the practice round and were significantly less likely to enter the competition. Their perception of winning in the first round was significantly lower and they on average scored significantly lower by less than one correct task (0.73) compared to males. In our experimental design, we chose not to force everyone into competition, as we are interested in the causal effect of failure attribution on those who chose to compete. Therefore, these initial differences are not problematic for our estimation. Nevertheless, we control for these differences in all our regressions. There is no significant difference in losing in round one. Importantly for our estimation, the control variables are balanced across treatments. Column (4) shows that there are no significant gender differences within each treatment group. Finally, using ANOVA test of equality of all four treatment groups means we find that gender, risk willingness, choice of the compensation scheme, score, confidence, rank, the rate of loss, and earnings in round one are all balanced across the four treatment groups (see Online Appendix A).

5. Results

5.1 The Effect of Negative Performance Feedback and Attributional Feedback on the Subsequent Willingness to Compete, Confidence, and Score

As a first step, we replicate the analysis of Buser and Yuan (2019) on whether losing in a competition decreases the willingness to compete. We also extended the analysis to investigate the effect of competition loss (would-be loss) on the subsequent confidence and score. At the end of round one and before choosing the compensation scheme for round two, subjects receive the "performance feedback". They learn their absolute score as well as the relative performance of whether they (would have) won/lost against their randomly matched

opponent. Note that all subjects receive this feedback, irrespective of whether they chose the piece rate or competitive compensation scheme at the beginning of the round. Conditional on a participant's own score, round one's outcome of win or loss is a random treatment as it depends on the score of a randomly assigned match. The reported results in this paper are ordinary least squares (OLS) regressions. All regressions are clustered at the subject level and controlling for score fixed effects (following the estimation strategy by Buser and Yuan (2019)). Furthermore, all regressions control for the standard variables of gender, age, risk willingness, optimism, confidence in R1, normalized rank, session fixed effects, and country fixed effects. Note that the normalized rank of each individual within the session is included to allow for differences in session size.

[[Insert Table 2 about here]]

To investigate the effect of competition loss (would-be loss) on subjects receiving performance feedback only (control group), table 2 reports ordinary least squares (OLS) regressions of willingness to compete in round two (Column 1-2), confidence before round two (Column 3-4), and score in round two (Column 5-6) on attributional feedback dummies (luck, effort, and ability), loss dummy, gender dummy, and interaction terms. The results are presented for the whole sample, as well as separately for those who choose to compete and those who choose the piece-rate compensation in round one. As reported in columns 2 and 3, losing a competition and receiving performance feedback for both those who choose to compete in the initial round and those who do not compete have a statistically negative effect on the willingness to compete in the following round. The estimate is larger for those who choose to compete previously. Those who choose the piece rate compensation are 31 percentage points less likely to start competing after losing compared to would-be winners. Those who choose to compete in the first round are 53 percentage points less likely to compete than winners. For both groups, confidence is significantly reduced after losing. Here

the effect sizes are identical for both groups (columns 5 and 6). Unsurprisingly, there is no effect of losing on the subsequent score for either group (columns 8 and 9).

[[Insert Table 3 about here]]

To study the effect of negative performance and attributional feedback on competition persistence, we narrow our investigation of the effect of our experimental treatments on those who competed in round 1. We analyze the effect of providing attributional feedback that attributes the loss to lack of luck, effort, or ability on the loser's subsequent willingness to compete, confidence, and score. Table 3 presents the regressions for each of the treatments and their interaction effects. As illustrated in Table 3, we do not find a significant effect of attributing a loss to lack of luck, lack of effort, and lack of ability on loser's willingness to compete in R2 (column 1-3), their confidence on R2 (column 4-6), or their subsequent score (column 7-9). Compared to those who receive performance feedback alone, those who also receive attributional feedback attributing their loss to their lack of luck, effort, or ability are just as likely to compete in the subsequent round.

[[Insert Table 4 about here]]

4.2 Gender Differences in the Effect of Negative Performance Feedback and Attributional Feedback on the Subsequent Willingness to Compete, Confidence, and Score

In the following section, we turn to our main research question. Are there gender differences in the response to attributional feedback? We replicate the analysis of the previous section by gender to investigate gender differences in competition persistence, confidence, and score in round 2. Tables 4 presents ordinary least squares (OLS) regressions of willingness to compete (Column 1-3), confidence before round two (Column 4-6), and score in round two (Column 7-9) on attributional feedback treatment dummies, loss dummy, competed in round one dummy, gender dummy, and interaction terms. The results are

presented for the whole sample, as well as separately for those who choose to compete and those who choose the piece-rate compensation in round one.

As previously reported, losing a competition and receiving only performance feedback has a significant negative effect on the subsequent willingness to compete for those who choose to compete in the initial round and those who do not (see Table 2). Looking at the interaction effect of Female and Losing in Round 1, we fail to find significant gender differences in the effect of negative feedback on the willingness to compete (column 2), confidence (column 5), and score (column 7) in the following round. While the estimates are negative and thus in line with previous findings by Buser and Yuan (2019), our high powered replication does not find significant gender differences on any of our outcome variables.

[[Insert Table 5 about here]]

Next, we will investigate the effect of providing attributional feedback that attributes the loss to lack of luck, effort, or ability on the loser's subsequent willingness to compete, confidence, and score. We again present the regressions for each of the treatments and their interaction effects. Column 1 in Table 5 provides evidence that attributional feedback that attributes a loss in a competition to lack of luck has a significant positive effect on the subsequent willingness to compete for women compared to men. Women who competed and lost in the luck attribution treatment are 41 percentage points more likely to compete in the following round than men who competed and received the same feedback. We do not find significant gender differences in attributing a loss to lack of luck on the subsequent confidence and score in round 2. We find no significant gender differences in the subsequent willingness to compete (column 2), confidence (column 5), and score (column 4) for those who chose to compete in the initial round and their loss is attributed to lack of effort. Finally, we investigate the gender difference in the effect of attributing a loss to lack of ability. This is where we find the most interesting results. Column 3 in Table 4 shows a negative and strongly significant result for our interaction term. Women are significantly less likely to compete in round 2 if they choose to compete, lose

in round 1, and their loss is attributed to lack of ability. We find a significant positive effect on the willingness to compete after losing and being exposed to the lack of ability feedback for males who choose to compete in the initial round. Males who competed and lost are 41 percentage points more likely to compete (column 3). On the contrary, females who choose to compete and are receiving the same attributional feedback are significantly less likely to compete in the following round by 57 percentage points compared to males (column 3). In regards to the subsequent confidence after receiving the ability attributional feedback, we find that females who choose to compete in round one experience a significant decrease in their confidence of 13 percentage points (column 6). There is no effect on scores in round 2.

To evaluate the extent to which the subsequent confidence is influencing the decision to not drop out and compete in the following round, we conducted a causal mediation analysis. Following Hicks and Tingley (2011), we use the *medeff* command in STATA to test how the updated confidence is explaining the relationship between females and their decision to remain in the competition in round two. Confidence in R1 has a significant mediation effect in females' subsequent willingness to compete after attributing their loss to lack of ability. The ACME (average causal mediated effect) of confidence in R1 is (-0.058) with a 95% confidence interval ranging from -0.13 to -0.01. The ADE (average direct effect) is -0.37 with a 95% confidence interval ranging from -0.63 to -0.09. The total effect of the mediation analysis of confidence in R2 is -0.42 with a 95% confidence interval ranging from -0.68 to -0.16. Thus, the updated confidence of females who choose to compete after attributing their loss to lack of ability explains 14% of the decrease in their willingness to compete in the following round.

5.2 Gender Differences in the Effect of Negative Performance Feedback and Attributional Feedback on the Subsequent Willingness to Compete, Confidence, and Score of the Highly Confident.

The mediating effect of confidence on the willingness to compete again raises the question about the role of the level of confidence. Would the individuals characterized by

high confidence react differently to attributing their loss to their lack of ability? We re-run our analyses focusing only on high confidence individuals. First, we conducted an independent-samples t-test to compare the initial willingness to compete between females with high confidence and those who are not high in confidence. We classify individuals based on their confidence in round one. A subject is highly confident when his/her confidence in round one is in the top 25th percentile. We find a significant difference in the willingness to compete for the highly confident females (M=0.5, SD=0.07) and those with lower confidence (M=0.21, SD=0.02; t (374)= -4.88, p = 0.000). Highly confident females have a higher willingness to compete in the initial round.

[[Insert Table 6 about here]]

Table 6 presents identical analyses to table 5, but only for the highly confident individuals. When we consider all treatments together, we fail to find significant gender differences in the effect of negative performance feedback on the subsequent willingness to compete, confidence, and score of those who choose to compete in the initial round (see Online Appendix B). Highly confident females who choose to compete are just as likely as their male counterparts to compete after losing and receiving performance feedback. Table 6 column (1) shows a marginally significant negative effect of attributing a loss to the lack of luck on the subsequent willingness to compete for males who choose to compete in the initial round. Highly confident males who choose to compete in round one are 50 percentage points less likely to compete when their loss is attributed to luck compared to losing in the control group. On the contrary, highly confident females who choose to compete in round one are significantly more likely to compete in the following round by 77 percentage points compared to males when they are in the luck treatment. Column (4) shows that the confidence of high confidence men is significantly lower by 11 percentage points when they lose in the luck treatment compared to the control treatment. There is no significant effect on high confidence

548 women. Finally, attributing a competition loss to lack of luck has no significant effect on the
549 scores of highly confident males and females.

550 As in the estimations with the whole sample, there are no effects of the effort
551 treatment on willingness to compete, confidence, and score for the highly confident individuals
552 (see Table 6). Again, the most interesting results are found for the ability treatment. As
553 reported in column (3), for men who choose to compete in the initial round, the estimates of
554 receiving negative feedback after a loss are positive, but no longer significant. This suggests
555 that the effect we found with the whole sample comes from men with different levels of
556 confidence. However, when we look at women, we find a highly significant negative effect of
557 competition loss and ability attribution on high-confidence women (column 3). The estimate is
558 approximately twice as high as in the whole sample (0.57 vs 1.16 percentage points). This
559 suggests that it is the initially highly confident women for whom the negative feedback
560 regarding their ability has the strongest effect. Compared to males, highly confident females
561 who chose to compete in the initial round and lost are 116 percentage points less likely to
562 continue to compete when their loss is attributed to a lack of ability(column 3). The reduction
563 in competition entry does not carry over in stated confidence before round two or scores in
564 round 2 (see column 6 and 9). As a robustness check, we repeat the analysis for high-ability
565 individuals (scored above the median) and confirm all our results.

566 **5.3 Gender Differences in the Effect of Negative Performance Feedback and**
567 **Attributional Feedback on the Subsequent Willingness to Compete, Confidence,**
568 **and Score of the High-ability Subjects**

569 In this section, we look at the gender differences in subsequent willingness to
570 compete, confidence, and score for those who are high in ability. We define a subject to be
571 high in ability if his/her score in round 1 is above the sample's median. We also find that high-
572 ability females are more likely to select themselves into a competition in round 1. Conducting
573 an independent-samples t-test to compare the initial willingness to compete, we find a

574 significant difference in the willingness to compete between high-ability females (M=0.33,
575 SD=0.04) and those with scores in round 1 below the median ((M=0.20, SD=0.02); t (374)= -
576 4.88, p = 0.004).

577 [[Insert Table 7 about here]]

578 Looking at the effect of negative performance feedback on the subsequent
579 willingness to compete, confidence, and score of those who choose to compete in the initial
580 round, we fail to find significant gender differences in the effect (see Online Appendix C). High-
581 ability females who choose to compete are just as likely as their male counterparts to compete
582 after losing and receiving performance feedback. Table 7 presents identical analyses to tables
583 5 and 6 that investigate the gender differences in the effect of loss attribution but only for high-
584 ability individuals. Table 7 column (1) shows a marginally significant negative effect of
585 attributing a loss to the lack of luck on the subsequent willingness to compete for males who
586 chose to compete in the initial round. High-ability males who choose to compete in round one
587 are 80 percentage points less likely to compete when their loss is attributed to luck compared
588 to losing in the control group. On the other hand, high-ability females who choose to compete
589 in round one are significantly more likely to compete in the following round by 80 percentage
590 points compared to their male counterparts. Table 7 also shows that the confidence and the
591 scores of high-ability men are not significantly lower when they lose in the luck treatment
592 compared to the control treatment. Finally, loss attribution to lack of luck has no significant
593 effect on the subsequent confidence and score of high-ability women compared to men.

594 In regards to loss attribution to lack of effort, column (2) presents that attributing
595 the loss to a lack of effort has no significant on the subsequent willingness to compete for
596 high-ability males. We also find no significant effect on high-ability women compared to their
597 male counterparts. As for the subsequent confidence after receiving the effort attributional
598 feedback, we find that while the treatment has a negative effect on men who choose to
599 compete in round 1 (column 5), it has no significant effect on high-ability women compared to

their male counterparts. Men who choose to compete in the initial round and had a decreased confidence of 13 percentage points. However, the confidence of high-ability men in the effort treatment compared to men who only received performance feedback is significantly lower by 13 percentage points. Finally, the subsequent performance of high-ability men suffered significantly from attributing the loss to a lack of effort. Column 8 shows a negative and strongly significant result for our interaction term. The subsequent score of high-ability men in the effort treatment is significantly lower by 170 points compared to high-ability men in the control treatment. However, we find no significant gender difference in the subsequent score between high-ability males and females.

Again, the most interesting results are found for the ability treatment. As reported in Table 7 column (3), the estimates of receiving the ability attribution are positive but not significant for high-ability men who choose to compete in the initial round compared to the control treatment. However, when we look at women, we find a highly significant negative effect of competing for high-ability women. Compared to males, high-ability women who choose to compete are 84 percentage points less likely to compete in the following round. The reduction in competition persistence is only carried over in stated confidence before round two (column 6) but not in scores in round 2 (column 9). Compared to men, the subsequent confidence of high-ability women is decreased by 13 percentage points as a result of loss attribution to lack of ability.

6. Discussion

Failure is a fundamental element of competitive and high-reward domains such as STEM fields, innovation, corporate senior leadership, and entrepreneurship. Thus, the endurance of failure and persistence in competing are keys to success in such environments. This paper investigates the gender difference in the willingness to compete after losing. It unfolds the role of attributing the outcome of loss to luck, effort, and ability on women's likelihood to persist and continue to compete. The results indicate that losing a competition

and receiving feedback about the absolute and relative performance has a significant negative effect on the likelihood to persist in the competition and subsequent confidence. Although women are less likely to enter a competition, we found no gender differences in the willingness to persist in a competition after losing. These findings are consistent with Wozniak et al. (2014) who investigate the effect of performance feedback on competition entry. However, our replication of Buser and Yuan (2019) does not replicate their result. In a sample of 188 individuals, they find evidence that losing a competition negatively influences females' subsequent willingness to compete. We carried out the experiment in both the UK and Germany and find no difference between the countries. The experiment in Buser and Yuan (2019) was conducted in the Netherlands. There is no reason to believe that German and British women would be less discouraged by losing compared to Dutch women, so the difference is unlikely to stem from cultural differences. We show that attributing the loss to a lack of ability produces the gender gap found in Buser and Yuan (2019). Thus, it is plausible, that within the sample of women, both in the lab experiment as well as in the Math Olympiad, a high share of women self-attributed their loss to a lack in their ability rather than to a lack of luck or effort. Especially, in the Math Olympiad sample, this seems plausible given evidence of a stereotype threat of women being of lower mathematical ability than men. Gender differences in the likelihood to persist after losing emerge when we analyze responses to attributional feedback. Women are more likely than men to compete again if their loss is attributed to a lack of luck. There are no gender effects when losing is attributed to a lack of effort. Most interestingly, the largest gender differences appear in the case where losing is attributed to a lack of ability. Compared to men, women are significantly less likely to persist and select into a competition again after losing. These results are confirmed and slightly larger for a sub-sample of highly confident individuals. We argue that such disparity between men and women in receiving ability feedback indicates a confirmation bias in women's over-weighting the ability feedback as it confirms previously held negative views about their ability (for a review see Rabin and Schrag (1999)).

To date the evidence in the literature is inconclusive about the nature of of the gender differences in attributing success and failure (e.g. Basow & Medcalf, 1988; Fox & Ferri, 1992; Stipek, 1984) Supporting this line of arguments, attributing a competition loss to a lack of luck has a positive effect on women's persistence in a competition. We believe that attributing an outcome of failure to an external cause such as luck had an opposite effect on their pre-existing internal self-attribution of failure. To confirm our arguments about the confirmation and opposition effect on loss attributions, we examined the answers to a question in our survey after the experiment that asked subjects to rate how much they think luck, as opposed to ability, contributed to their outcome in the task using a scale from 0% to 100%. The results indicate that females who choose to compete, lose, and only receive performance feedback (control group) attribute their outcome to luck versus their own performance at a lower rate compared to males (see Appendix D). Generally, the addition of attributional feedback provides insights into why we might see differences in persistence after losing in a competition. These insights are necessary if we want to design better feedback institutions. In our design, the experimental task was purposely ambiguous about the source of attributions (luck, effort, and ability). Further, it was only a computer program that gave the feedback, not a teacher or peer. Yet subjects, especially women, did internalize and update their behavior according to this subjective and possibly inaccurate feedback.

7. Conclusion

Our research highlights the role of the gender difference in competition persistence in driving women underrepresentation in competitive and high-reward domains. In this paper, we examine the impact of failure and failure attribution on men and women's persistence in competition. In a laboratory experiment, we unfolded the gender differences in the impact of losing a competition and attributing the loss to one of the three causal attributions - luck, effort, and ability - on the subsequent willingness to compete. Several interesting

findings emerge that contribute to our understanding of what drives gender differences in response to different attributional feedback and how such differences shape the gender gap in competition. Overall, we find no gender differences in the willingness to compete after losing. However, when the loss is randomly attributed to a lack of luck, women increase their willingness to compete, while they are less likely to compete when their loss is randomly attributed to a lack of ability. There is no gender difference when a loss is randomly attributed to a lack of effort. The positive effect of luck loss attribution and the negative effect of ability loss attribution is also observed on the highly confident and high-ability women whom we found to be more likely to select themselves into a competition. Developing a deeper understanding of the circumstance under which women have a negative reaction to losing in a competition could help to design better feedback mechanisms. The negative effect of attributing a loss to a lack of ability is driving women in general and more importantly those who are high-ability and high in confidence away from competitive and high-reward domains costing a significant economic loss in a form of growth, job creation, and innovation. To prevent such loss, it is crucial to maintain those women who have preferences for competition and at the same time are high in ability. Nevertheless, it is impossible to avert them from experiencing failure in competitive workplaces or entrepreneurial settings. Therefore, emphasizing performance measures, the role of luck, or the role of effort in the outcome of failure rather than the role of ability would create gender equality in competition persistence, which as a result would positively contribute to female underrepresentation in competitive and high-reward domains.

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800

Table 1. Descriptive Statistics by Gender

	(1) All	(2) Male	(3) Female	(4) p-value
Score in practice round	5.058	5.275	4.891	0.384**
	(2.260)	(2.441)	(2.098)	0.029
Total earnings	9.766	10.34	9.322	1.019***
	(3.543)	(4.178)	(2.889)	0.000
Compete in R1	0.366	0.509	0.255	0.253***
	(0.482)	(0.501)	(0.437)	0.000
Score in R1	6.517	6.928	6.199	0.728***
	(2.563)	(2.744)	(2.369)	0.000
Confidence in R1	0.607	0.674	0.555	0.119***
	(0.233)	(0.224)	(0.227)	0.000
Rank in R1	0.517	0.486	0.541	-0.0546**
	(0.286)	(0.291)	(0.280)	0.015
Lost in R1	0.477	0.460	0.489	-0.0289
	(0.500)	(0.499)	(0.501)	0.460
Earnings in R1	3.774	4.258	3.399	0.859***
	(3.122)	(3.725)	(2.501)	0.000
Luck Feedback Group	0.267	0.296	0.245	0.384**
	(0.443)	(0.457)	(0.430)	0.029
Effort Feedback Group	0.274	0.265	0.282	1.019***
	(0.447)	(0.442)	(0.451)	0.000
Ability Feedback Group	0.228	0.216	0.237	0.253***
	(0.420)	(0.413)	(0.426)	0.000
Control Feedback Group	0.231	0.223	0.237	0.728***
	(0.422)	(0.417)	(0.426)	0.000
Observations	667	291	376	

Note: This table presents the full sample means as well as the means of each gender group for the score on the practice round, the total earnings, the choice to compete in R1, the average score in R1, confidence in R1, normalized within-session rank in R1, losing against the opponent in R1, earnings in Euros/GBP in R1, as well as treatment groups. Standard decisions are in parentheses. Column (4) presents p-values from t-tests of the gender difference.

Table 2. Multiple Regression Analysis: The Effect of Negative Performance Feedback on Subsequent Willingness to Compete, Confidence, and Score

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	C R1	PR R1	All	C R1	PR R1	All	C R1	PR R1
Luck Feedback	-0.008	-0.066	0.021	0.027*	-0.003	0.050**	0.447*	0.074	0.758**
	(0.056)	(0.055)	(0.084)	(0.014)	(0.017)	(0.022)	(0.243)	(0.412)	(0.298)
Effort Feedback	0.029	-0.055	0.089	0.020	-0.018	0.042**	0.180	0.321	0.045
	(0.059)	(0.042)	(0.082)	(0.012)	(0.016)	(0.017)	(0.261)	(0.468)	(0.284)
Ability Feedback	0.010	-0.029	0.043	0.031*	-0.006	0.060**	0.158	0.489	-0.043
	(0.077)	(0.052)	(0.111)	(0.016)	(0.020)	(0.024)	(0.242)	(0.336)	(0.308)
Lost in R1	-0.411***	-0.533***	-0.314***	-0.130***	-0.129***	-0.123***	0.404	0.000	0.528
	(0.060)	(0.120)	(0.091)	(0.017)	(0.030)	(0.023)	(0.274)	(0.618)	(0.366)
Confidence in R1	0.335***	0.366*	0.351***	0.644***	0.646***	0.645***	1.228***	2.157***	0.876**
	(0.070)	(0.193)	(0.090)	(0.034)	(0.060)	(0.049)	(0.290)	(0.654)	(0.357)
_cons	-0.058	0.712***	-0.320*	0.298***	0.355***	0.263***	-0.416	-1.037	0.231
	(0.149)	(0.240)	(0.187)	(0.053)	(0.100)	(0.087)	(0.902)	(1.674)	(1.032)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	667	244	423	667	244	423	667	244	423

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on dummies for luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, confidence in R1, as well as interaction terms. Results are presented for the whole sample, those who competed in R1, and those who chose piece-rate compensation in R1 respectively. All regression control for gender, age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Table 3. Multiple Regression Analysis: The Effect of Negative Attributional Feedback on Subsequent Willingness to Compete, Confidence, and Score for Subjects Who Competed in R1

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Luck	Effort	Ability	Luck	Effort	Ability	Luck	Effort	Ability
Luck Feedback	-0.066	-0.066	-0.066	-0.003	-0.003	-0.003	0.074	0.074	0.074
	(0.055)	(0.055)	(0.055)	(0.017)	(0.017)	(0.017)	(0.412)	(0.412)	(0.412)
Effort Feedback	-0.055	-0.055	-0.055	-0.018	-0.018	-0.018	0.321	0.321	0.321
	(0.042)	(0.042)	(0.042)	(0.016)	(0.016)	(0.016)	(0.468)	(0.468)	(0.468)
Ability Feedback	-0.029	-0.029	-0.029	-0.006	-0.006	-0.006	0.489	0.489	0.489
	(0.052)	(0.052)	(0.052)	(0.020)	(0.020)	(0.020)	(0.336)	(0.336)	(0.336)
Lost in R1	-0.533***	-0.533***	-0.533***	-0.129***	-0.129***	-0.129***	0.000	0.000	0.000
	(0.120)	(0.120)	(0.120)	(0.030)	(0.030)	(0.030)	(0.618)	(0.618)	(0.618)
Confidence in R1	0.366*	0.366*	0.366*	0.646***	0.646***	0.646***	2.157***	2.157***	2.157***
	(0.193)	(0.193)	(0.193)	(0.060)	(0.060)	(0.060)	(0.654)	(0.654)	(0.654)
Luck Feedback x Lost in R1	0.030			-0.028			0.011		
	(0.139)			(0.046)			(0.700)		
Effort Feedback x Lost in R1		-0.096			-0.040			-0.612	
		(0.132)			(0.038)			(0.740)	
Ability Feedback x Lost in R1			0.131			-0.075			-0.107
			(0.195)			(0.057)			(0.675)
_cons	0.712***	0.712***	0.712***	0.355***	0.355***	0.355***	-1.037	-1.037	-1.037
	(0.240)	(0.240)	(0.240)	(0.100)	(0.100)	(0.100)	(1.674)	(1.674)	(1.674)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	244	244	244	244	244	244	244	244	244

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, confidence in R1, as well as interaction terms. All regression control for gender, age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Results are presented for the subjects who competed in R1 and received the luck attributional feedback, effort attributional feedback, and ability attributional feedback respectively. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Table 4. Multiple Regression Analysis: The Gender Difference in the Effect of Negative Performance Feedback on Subsequent Willingness to Compete, Confidence, and Score

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	C R1	PR R1	All	C R1	PR R1	All	C R1	PR R1
Luck Feedback	-0.006	-0.053	0.022	0.027*	-0.002	0.049**	0.434*	0.104	0.751**
	(0.057)	(0.058)	(0.085)	(0.014)	(0.017)	(0.022)	(0.246)	(0.443)	(0.301)
Effort Feedback	0.030	-0.049	0.091	0.019	-0.017	0.041**	0.173	0.335	0.032
	(0.059)	(0.041)	(0.082)	(0.012)	(0.016)	(0.017)	(0.260)	(0.478)	(0.286)
Ability Feedback	0.011	-0.022	0.044	0.030*	-0.006	0.060**	0.154	0.505	-0.048
	(0.077)	(0.052)	(0.111)	(0.016)	(0.020)	(0.024)	(0.240)	(0.340)	(0.308)
Lost in R1	-0.391***	-0.472***	-0.276***	-0.136***	-0.125***	-0.144***	0.294	0.141	0.304
	(0.059)	(0.132)	(0.095)	(0.019)	(0.038)	(0.026)	(0.344)	(0.753)	(0.433)
Confidence in R1	0.335***	0.380*	0.351***	0.644***	0.647***	0.645***	1.228***	2.189***	0.876**
	(0.071)	(0.194)	(0.092)	(0.034)	(0.060)	(0.049)	(0.288)	(0.638)	(0.354)
Female	0.033	0.012	0.079	-0.023*	-0.014	-0.037*	-0.043	0.009	-0.013
	(0.031)	(0.034)	(0.048)	(0.013)	(0.012)	(0.018)	(0.193)	(0.334)	(0.254)
Lost in R1 x	-0.035	-0.136	-0.058	0.011	-0.008	0.032	0.188	-0.309	0.341
Female	(0.049)	(0.113)	(0.057)	(0.020)	(0.031)	(0.025)	(0.252)	(0.565)	(0.336)
_cons	-0.077	0.648**	-0.350*	0.304***	0.352***	0.280***	-0.312	-1.184	0.410
	(0.149)	(0.235)	(0.182)	(0.057)	(0.102)	(0.089)	(0.869)	(1.654)	(1.022)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	667	244	423	667	244	423	667	244	423

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on dummies for luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, a dummy for gender, confidence in R1, as well as interaction terms. Results are presented for the whole sample, those who competed in R1, and those who chose piece-rate compensation in R1 respectively. All regression control for age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Table 5. Multiple Regression Analysis: The Gender Difference in the Effect of Negative Attributional Feedback on Subsequent Willingness to Compete, Confidence, and Score for Subjects Who Competed in R1

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Luck	Effort	Ability	Luck	Effort	Ability	Luck	Effort	Ability
Luck Feedback	-0.048	-0.058	-0.048	0.008	-0.003	-0.002	-0.060	0.094	0.111
	(0.057)	(0.060)	(0.058)	(0.021)	(0.017)	(0.017)	(0.579)	(0.437)	(0.446)
Effort Feedback	-0.048	-0.087	-0.047	-0.017	-0.028	-0.018	0.325	0.258	0.338
	(0.041)	(0.061)	(0.041)	(0.016)	(0.022)	(0.015)	(0.485)	(0.540)	(0.480)
Ability Feedback	-0.022	-0.025	0.007	-0.005	-0.006	-0.009	0.485	0.500	0.551
	(0.052)	(0.053)	(0.031)	(0.020)	(0.020)	(0.021)	(0.335)	(0.346)	(0.485)
Lost in R1	-0.442***	-0.460***	-0.528***	-0.125***	-0.115***	-0.138***	0.107	0.148	0.102
	(0.128)	(0.146)	(0.139)	(0.038)	(0.041)	(0.038)	(0.792)	(0.743)	(0.783)
Confidence in R1	0.400**	0.378*	0.434**	0.645***	0.645***	0.657***	2.192***	2.186***	2.231***
	(0.193)	(0.194)	(0.177)	(0.058)	(0.059)	(0.057)	(0.615)	(0.639)	(0.639)
Female	0.015	-0.011	0.028	-0.006	-0.020	-0.015	-0.120	-0.037	0.033
	(0.033)	(0.042)	(0.044)	(0.016)	(0.016)	(0.013)	(0.404)	(0.339)	(0.364)
Luck Feedback x Lost in R1	-0.112			-0.022			-0.014		
	(0.156)			(0.047)			(0.839)		
Luck Feedback x Lost in R1 x Female	0.405*			-0.028			0.023		
	(0.236)			(0.087)			(0.891)		
Effort Feedback x Lost in R1		-0.123			-0.069			-0.619	
		(0.195)			(0.044)			(0.855)	
Effort Feedback x Lost in R1 x Female		0.063			0.065			0.016	
		(0.269)			(0.059)			(1.421)	
Ability Feedback x Lost in R1			0.409**			-0.016			0.094
			(0.186)			(0.058)			(0.955)
Ability Feedback x Lost in R1 x Female			-0.569***			-0.127*			-0.387
			(0.201)			(0.064)			(1.244)
_cons	0.639**	0.657***	0.595**	0.345***	0.352***	0.346***	-1.078	-1.161	-1.236
	(0.240)	(0.226)	(0.232)	(0.103)	(0.098)	(0.101)	(1.669)	(1.598)	(1.665)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	244	244	244	244	244	244	244	244	244

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, confidence in R1, a dummy for gender, as well as interaction terms. All regression control for age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Results are presented for the subjects who competed in R1 and received the luck attributional feedback, effort attributional feedback, and ability attributional feedback respectively. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Table 6. Multiple Regression Analysis: The Gender Difference in the Effect of Negative Attributional Feedback on Subsequent Willingness to Compete, Confidence, and Score for the Highly Confident Subjects Who Competed in R1

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Luck	Effort	Ability	Luck	Effort	Ability	Luck	Effort	Ability
Luck Treatment	-0.053	-0.037	-0.038	0.044**	0.037*	0.037*	-0.140	-0.065	-0.061
	(0.096)	(0.070)	(0.073)	(0.021)	(0.018)	(0.019)	(0.675)	(0.579)	(0.581)
Effort Treatment	-0.084	-0.082	-0.087	0.009	0.006	0.007	-0.098	-0.176	-0.080
	(0.056)	(0.060)	(0.060)	(0.020)	(0.023)	(0.021)	(0.449)	(0.632)	(0.447)
Ability Treatment	0.006	0.009	-0.002	0.044*	0.043*	0.049*	0.515	0.542	0.557
	(0.050)	(0.052)	(0.052)	(0.022)	(0.022)	(0.028)	(0.547)	(0.561)	(0.673)
Lost in R1	-0.255	-0.348	-0.411*	-0.047	-0.036	-0.045	1.293	1.080	1.247
	(0.215)	(0.218)	(0.214)	(0.050)	(0.052)	(0.053)	(0.887)	(0.900)	(0.887)
Confidence in R1	0.200	0.169	0.126	0.838***	0.791***	0.826***	3.661	4.251	3.598
	(0.655)	(0.629)	(0.781)	(0.124)	(0.121)	(0.127)	(4.518)	(4.253)	(4.368)
Female	0.036	0.031	0.019	-0.001	-0.007	-0.002	-0.623	-0.721	-0.530
	(0.033)	(0.040)	(0.038)	(0.017)	(0.012)	(0.020)	(0.605)	(0.718)	(0.657)
Luck Treatment x Lost in R1	-0.499*			-0.109*			-0.888		
	(0.248)			(0.056)			(1.050)		
Luck Feedback x Lost in R1 x Female	0.765**			-0.026			0.720		
	(0.281)			(0.138)			(1.478)		
Effort Treatment x Lost in R1		-0.362			-0.111			-1.350	
		(0.303)			(0.066)			(1.380)	
Effort Feedback x Lost in R1 x Female		-0.285			0.105			-1.687	
		(0.429)			(0.098)			(2.375)	
Ability Treatment x Lost in R1			0.363			-0.095			-1.361
			(0.216)			(0.059)			(1.106)
Ability Feedback x Lost in R1 x Female			-1.158***			-0.012			0.378
			(0.390)			(0.085)			(2.312)
_cons	0.659	0.678	0.674	0.086	0.135	0.096	0.008	-0.478	0.014
	(0.701)	(0.629)	(0.799)	(0.167)	(0.153)	(0.172)	(5.167)	(4.804)	(4.996)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	104	104	104	104	104	104	104	104	104

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, confidence in R1, a dummy for gender, as well as interaction terms. All regression control for age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Results are presented for the sub-sample of the highly confident subjects (top 25th percentile) who competed in R1 and received the luck attributional feedback, effort attributional feedback, and ability attributional feedback respectively. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Table 7. Multiple Regression Analysis: The Gender Difference in the Effect of Negative Attributional Feedback on Subsequent Willingness to Compete, Confidence, and Score for the High-ability Subjects Who Competed in R1

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Luck	Effort	Ability	Luck	Effort	Ability	Luck	Effort	Ability
Luck Treatment	-0.051	-0.086	-0.079	0.030*	0.016	0.018*	0.018	0.163	0.196
	(0.045)	(0.054)	(0.057)	(0.015)	(0.010)	(0.010)	(0.547)	(0.458)	(0.470)
Effort Treatment	-0.076**	-0.120*	-0.078**	-0.002	-0.008	-0.000	0.527	0.318	0.545
	(0.035)	(0.065)	(0.035)	(0.026)	(0.030)	(0.025)	(0.465)	(0.545)	(0.461)
Ability Treatment	-0.033	-0.040	-0.014	0.001	0.000	0.006	0.343	0.348	0.408
	(0.042)	(0.045)	(0.026)	(0.016)	(0.017)	(0.018)	(0.426)	(0.422)	(0.529)
Lost in R1	-0.097	-0.277	-0.353	-0.094*	-0.055	-0.101**	0.967	1.517***	1.155
	(0.237)	(0.312)	(0.267)	(0.050)	(0.049)	(0.047)	(0.816)	(0.461)	(0.722)
Confidence in R1	0.255	0.265	0.279	0.651***	0.650***	0.652***	4.046***	4.009***	4.032***
	(0.231)	(0.221)	(0.205)	(0.096)	(0.091)	(0.089)	(1.226)	(1.253)	(1.232)
Female	0.027	-0.018	0.014	0.009	-0.007	-0.000	0.050	0.054	0.217
	(0.033)	(0.049)	(0.048)	(0.016)	(0.014)	(0.014)	(0.378)	(0.398)	(0.425)
Luck Treatment x Lost in R1	-0.754***			-0.002			-1.049		
	(0.261)			(0.059)			(1.250)		
Luck Feedback x Lost in R1 x Female	0.752**			-0.004			-1.340		
	(0.364)			(0.096)			(1.428)		
Effort Treatment x Lost in R1		-0.393			-0.126**			-1.696*	
		(0.355)			(0.053)			(0.907)	
Effort Feedback x Lost in R1 x Female		-0.093			0.093			0.617	
		(0.491)			(0.091)			(1.613)	
Ability Treatment x Lost in R1			0.144			-0.017			-0.041
			(0.337)			(0.069)			(0.710)
Ability Feedback x Lost in R1 x Female			-0.844**			-0.129*			-0.571
			(0.331)			(0.067)			(1.547)
_cons	0.891***	0.864***	0.871***	0.319**	0.329**	0.336**	-0.793	-0.808	-0.834
	(0.231)	(0.222)	(0.241)	(0.121)	(0.119)	(0.126)	(2.140)	(2.113)	(2.230)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	144	144	144	144	144	144	144	144	144

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, confidence in R1, a dummy for gender, as well as interaction terms. All regression control for age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Results are presented for the sub-sample of the high-ability subject (above median) who competed in R1 and received the luck attributional feedback, effort attributional feedback, and ability attributional feedback respectively. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Appendix A. Descriptive Statistics by Gender and Treatment Group

	(1) All	(2) Male	(3) Female	(4) p-value	(5) Luck	(6) Effort	(7) Ability	(8) Control	(9) p-value
Female	0.564				0.517	0.579	0.586	0.578	0.536
	(0.496)				(0.501)	(0.495)	(0.494)	(0.496)	
Age	25.31	25.91	24.84	0.018	25.43	25.66	24.70	25.36	0.496
	(5.825)	(5.742)	(5.853)		(5.674)	(6.555)	(4.700)	(6.083)	
Science & technology	0.337	0.423	0.271	0.000	0.348	0.306	0.342	0.357	0.758
	(0.473)	(0.495)	(0.445)		(0.478)	(0.462)	(0.476)	(0.481)	
United Kingdom	0.456	0.454	0.457	0.922	0.433	0.448	0.487	0.461	0.793
	(0.498)	(0.499)	(0.499)		(0.497)	(0.499)	(0.501)	(0.500)	
Risk willingness	4.496	5.168	3.976	0.000	4.567	4.492	4.349	4.565	0.878
	(2.695)	(2.662)	(2.607)		(2.708)	(2.820)	(2.509)	(2.725)	
Optimism	5.868	5.966	5.793	0.430	6.073	6.060	5.480	5.786	0.184
	(2.807)	(2.793)	(2.819)		(2.764)	(2.671)	(2.814)	(2.984)	
Score in practice round	5.058	5.275	4.891	0.029	4.994	4.978	4.980	5.305	0.496
	(2.260)	(2.441)	(2.098)		(2.231)	(2.201)	(2.257)	(2.369)	
Total earnings	9.766	10.34	9.322	0.000	9.928	9.603	9.541	9.995	0.570
	(3.543)	(4.178)	(2.889)		(3.431)	(3.618)	(3.349)	(3.773)	
Competed in R1	0.366	0.509	0.255	0.000	0.365	0.377	0.316	0.403	0.452
	(0.482)	(0.501)	(0.437)		(0.483)	(0.486)	(0.466)	(0.492)	
Score in R1	6.517	6.928	6.199	0.000	6.404	6.601	6.250	6.812	0.238
	(2.563)	(2.744)	(2.369)		(2.579)	(2.524)	(2.466)	(2.671)	
Confidence in R1	0.607	0.674	0.555	0.000	0.623	0.613	0.568	0.621	0.129
	(0.233)	(0.224)	(0.227)		(0.231)	(0.235)	(0.228)	(0.237)	
Rank in R1	0.517	0.486	0.541	0.015	0.527	0.512	0.538	0.490	0.494
	(0.286)	(0.291)	(0.280)		(0.293)	(0.276)	(0.298)	(0.279)	
Lost in R1	0.477	0.460	0.489	0.460	0.534	0.443	0.493	0.435	0.221
	(0.500)	(0.499)	(0.501)		(0.500)	(0.498)	(0.502)	(0.497)	
Earnings in R1	3.774	4.258	3.399	0.000	3.792	3.626	3.539	4.159	0.306
	(3.122)	(3.725)	(2.501)		(3.075)	(3.117)	(2.908)	(3.370)	
Observations	667	291	376		178	183	152	154	

Note: This table presents the full sample means as well as the means of each gender and treatment group for gender, age, science and technology as a field of education, the United Kingdom as country of residence, risk willingness (1-10), optimism (1-10), score on the practice round, as well as the total earnings. The table also presents the full sample means as well as the means of each gender group and treatment group of the experimental choices and outcomes in round one including the subject's choice to compete, average score, confidence, normalized within-session rank, losing against the opponent, and earnings in R1. Risk willingness and Optimism are self-rated questionnaire measures. Earnings are in Euros/GBP. Standard decisions are in parentheses. Column (4) presents p-values from t-tests of the gender difference and column (9) presents p-values from ANOVA test of equality of all four treatment group means.

Appendix B. Multiple Regression Analysis: The Gender Difference in the effect of Negative Performance Feedback on Subsequent Willingness to Compete, Confidence, and Score of the Highly Confident

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	C R1	PR R1	All	C R1	PR R1	All	C R1	PR R1
Luck Treatment	0.009	-0.037	0.070	0.018	0.037*	-0.008	0.249	-0.061	0.557
	(0.087)	(0.072)	(0.161)	(0.021)	(0.018)	(0.040)	(0.420)	(0.571)	(1.134)
Effort Treatment	-0.010	-0.077	0.045	0.004	0.008	-0.039	-0.078	-0.082	-0.055
	(0.097)	(0.058)	(0.232)	(0.022)	(0.020)	(0.032)	(0.333)	(0.440)	(0.741)
Ability Treatment	0.095	0.007	0.064	0.019	0.043*	0.013	0.398	0.520	-0.062
	(0.086)	(0.054)	(0.220)	(0.021)	(0.022)	(0.049)	(0.490)	(0.544)	(1.174)
Lost in R1	-0.296*	-0.325	-0.231	-0.078**	-0.044	-0.140**	0.924	1.221	0.514
	(0.146)	(0.208)	(0.289)	(0.037)	(0.050)	(0.051)	(0.658)	(0.851)	(0.926)
Confidence in R1	0.694	0.064	2.486*	0.915***	0.831***	0.979**	1.734	3.651	4.368
	(0.543)	(0.689)	(1.320)	(0.171)	(0.132)	(0.461)	(2.821)	(4.294)	(4.934)
Female	0.031	0.043	0.033	0.009	-0.006	-0.020	-0.152	-0.565	0.051
	(0.075)	(0.033)	(0.177)	(0.016)	(0.013)	(0.037)	(0.376)	(0.529)	(0.681)
Lost in R1 x	0.032	0.178	-0.143	-0.022	-0.030	0.023	-0.306	-0.704	0.829
Female	(0.196)	(0.182)	(0.284)	(0.033)	(0.052)	(0.060)	(0.680)	(0.900)	(0.774)
_cons	-0.262	0.770	-2.758*	-0.006	0.096	-0.085	1.063	-0.020	-2.222
	(0.649)	(0.709)	(1.495)	(0.162)	(0.173)	(0.401)	(3.199)	(4.958)	(3.453)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	167	104	63	167	104	63	167	104	63

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on dummies for luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, a dummy for gender, confidence in R1, as well as interaction terms. Results are presented for the whole sub-sample of the highly confident subject (top 25th percentile), those who competed in R1, and those who chose piece-rate compensation in R1 respectively. All regression control for age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Appendix C. Multiple Regression Analysis: The Gender Difference in the effect of Negative Performance Feedback on Subsequent Willingness to Compete, Confidence, and Score of High-ability Subjects

	Compete in R2			Confidence in R2			Score in R2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	C R1	PR R1	All	C R1	PR R1	All	C R1	PR R1
Luck Treatment	-0.039	-0.095	-0.011	0.021	0.019	0.018	-0.263	-0.686	0.296
	(0.072)	(0.060)	(0.110)	(0.015)	(0.014)	(0.023)	(0.417)	(0.596)	(0.638)
Effort Treatment	-0.032	-0.125**	0.066	0.011	-0.012	0.030	-0.228	0.085	-0.461
	(0.073)	(0.056)	(0.107)	(0.017)	(0.022)	(0.021)	(0.351)	(0.659)	(0.537)
Ability Treatment	0.014	-0.015	0.032	0.018	-0.003	0.031*	-0.130	0.070	-0.250
	(0.082)	(0.056)	(0.136)	(0.012)	(0.017)	(0.017)	(0.346)	(0.574)	(0.560)
Lost in R1	-0.418***	-0.516***	-0.287**	-0.146***	-0.145***	-0.140***	-1.320***	-1.396**	-1.417***
	(0.069)	(0.123)	(0.109)	(0.022)	(0.030)	(0.032)	(0.435)	(0.649)	(0.476)
Confidence in R1	0.723***	0.196	0.318	0.704***	0.653***	0.715***	4.257***	5.162***	2.990***
	(0.159)	(0.246)	(0.225)	(0.038)	(0.093)	(0.058)	(0.659)	(1.487)	(0.918)
Female	-0.029	-0.012	0.089	-0.021*	-0.012	-0.026	-0.244	-0.502	0.127
	(0.042)	(0.032)	(0.061)	(0.012)	(0.012)	(0.022)	(0.363)	(0.579)	(0.433)
Lost in R1 x	-0.004	0.031	-0.138	-0.014	-0.009	-0.022	0.591	0.137	0.863
Female	(0.096)	(0.194)	(0.099)	(0.031)	(0.052)	(0.035)	(0.585)	(0.733)	(0.712)
_cons	0.214	0.874***	0.194	0.270***	0.323***	0.255***	6.256***	5.873***	6.595***
	(0.153)	(0.196)	(0.192)	(0.033)	(0.079)	(0.046)	(0.508)	(1.387)	(0.499)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	315	144	171	315	144	171	315	144	171

Note. This table presents the results from least squares regressions of willingness to compete in R2 (columns 1-3), confidence in R2 (Column 4-6), score in R2 (7-9) on dummies for luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, a dummy for gender, confidence in R1, as well as interaction terms. Results are presented for the whole sub-sample of the highly confident subject (top 25th percentile), those who competed in R1, and those who chose piece-rate compensation in R1 respectively. All regression control for age, risk willingness, optimism, normalized rank within the session, score fixed effects, session fixed effects, and country fixed effects. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.

Appendix D. Multiple Regression Analysis: The Gender Difference in the effect of Performance Feedback on Causal Attributions to Luck and Effort

	Due to Luck			Due to Effort		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	C R1	PR R1	All	C R1	PR R1
Luck Treatment	-2.992	-5.132	-1.410	1.609	-2.721	4.297
	(4.698)	(6.629)	(5.494)	(3.687)	(6.099)	(4.313)
Effort Treatment	1.603	-6.157	5.772	-4.397	-9.293	-1.181
	(3.493)	(6.034)	(4.063)	(3.493)	(6.077)	(4.623)
Ability Treatment	-7.224	-9.848	-5.956	-5.017	-7.988	-2.701
	(4.368)	(7.849)	(4.731)	(3.785)	(6.191)	(4.267)
Lost in R1	0.543	8.441	-8.543	-2.168	-0.102	-1.270
	(5.909)	(11.766)	(5.300)	(5.703)	(10.848)	(7.303)
Confidence in R1	1.038	-4.975	4.557	-11.667***	-34.161***	-2.349
	(6.410)	(12.022)	(6.304)	(4.147)	(9.198)	(5.556)
Female	6.533***	6.354	3.629	2.017	-1.441	3.746
	(2.106)	(4.098)	(2.589)	(2.056)	(5.376)	(3.913)
Lost in R1 x	-4.417	-14.017**	4.834	-2.915	-0.579	-4.241
Female	(3.316)	(5.303)	(3.983)	(3.083)	(6.338)	(6.387)
_cons	31.952**	57.912***	17.916	57.232***	84.656***	49.806**
	(12.226)	(20.811)	(13.940)	(12.573)	(20.332)	(23.557)
Score FE	Yes	Yes	Yes	Yes	Yes	Yes
Session FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	667	244	423	667	244	423

Note. This table presents the results from least squares regressions of Causal Attributions to Luck (columns 1-3)and Causal Attributions to Effort (Column 4-6) as opposed to ability on dummies for luck, effort, and ability attributional feedback treatment dummies, a dummy for whether the individual lost in the previous round, a dummy for gender, confidence in R1, as well as interaction terms. Results are presented for the whole sub-sample of the highly confident subject (top 25th percentile), those who competed in R1, and those who chose piece-rate compensation in R1 respectively. All regression control for age, risk willingness, optimism, normalized rank within the session, score in R2, score in fixed effects, session fixed effects, and country fixed effects. Standard errors in the second row and they are corrected for clustering at the subject level. * p<0.10, ** p<0.05, *** p<0.01.