The effects of preparation on gender differences in choice to compete

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Abstract

Previous research suggests that women compete less than men, even when there are no gender differences in performance. This reluctance to compete may result in lower earnings and contribute to the gender wage gap. We conducted three experiments involving over X participants recruited from an online marketplace to causally test whether preparation for a task can reduce gender differences in competitiveness by increasing women’s willingness to compete. We test this in three experiments using a multiplication task. Specifically, we test whether the gender difference in willingness to compete is reduced by 1) informing participants about an opportunity to practice before completing the task (Study 1), 2) by allowing participants limited practice before the task (Study 2), and 3) by allowing participants unlimited practice before the task (Study 3). Contrary to our hypotheses we find no evidence, in any of the studies, that preparation affects willingness to compete in either men or women. Instead, we discover a sizable gender gap in preparation, where, depending on the study, women are between X% and X% more likely to prepare than men, regardless of whether they choose to compete. These findings align with participants’ incentivized beliefs: More than X% of participants in each study correctly predicted that women would prepare more than men. Our findings suggest that preparation is ineffective at reducing the gender gap in competitiveness. Instead, we uncover a sizable gender difference in preparation. Given the potential opportunity costs associated with preparing, future work should explore whether women overprepare relative to men.

*Keywords:* gender, gender differences, choice to compete, competitiveness, preparation, practice

*Word count:* XXXX

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# Introduction

Women have surpassed men in education outcomes, like college attendance and graduation rates (Blau & Kahn, 2017; Goldin, Katz, & Kuziemko, 2006; Stoet & Geary, 2014), but continue to be underrepresented in top management positions in nearly all sectors (Bertrand & Hallock, 2001). And a sizable gender wage gap still persists worldwide (Blau & Kahn, 2017). Traditional economic variables, such as household divisions of labor and discrimination, account for some, but not all, of these disparities (Blau & Kahn, 2017)). As such, researchers have begun to consider psychological gender differences, including the predilection for competition,as means of understanding persistent gender gaps in labor market outcomes, ~~one’s response to competition~~ (for review, see Niederle & Vesterlund, 2011).

Women are, on average, less competitive than men (for review, see X). Seminal work on gender differences in competitiveness operationalized competitiveness as the choice of a tournament payment scheme, that reaps potentially higher earnings but requires outperforming an opponent, over a piece-rate scheme where participants are paid per unit of work they produce (Niederle & Vesterlund, 2007). This research found that women are less likely to choose tournaments, even when they would have earned more by competing (Niederle & Vesterlund, 2007). Numerous conceptual replications over the past 15 years suggests that the gender difference in willingness to compete is robust (cite a couple reviews). ~~Follow-up research with nearly identical procedures has replicated the effect of gender on the choice to opt into tournaments (see Niederle & Vesterlund, 2011 for review).~~ Notably, this effect has been replicated in diverse populations (e.g., across age groups and cultures) (Andersen, Ertac, Gneezy, List, & Maximiano, 2013; Apicella & Dreber, 2015; Buser et al., 2014; Buser, Peter, & Wolter, 2017; Dreber, Essen, & Ranehill, 2014; Mayr, Wozniak, Davidson, Kuhns, & Harbaugh, 2012; Sutter, Glätzle-Rützler, Balafoutas, & Czermak, 2016; Sutter & Rutzler, 2010) and with a diverse set of tasks (Apicella & Dreber, 2015; Bjorvatn, Falch, & Hernæs, 2016; Frick, 2011; Saccardo, Pietrasz, & Gneezy, 2018; Samek, 2019; Sutter & Glätzle-Rützler, 2015). Importantly, this laboratory measure of competitiveness predicts labor market outcomes, including education choices (Buser, Niederle, & Oosterbeek, 2014; Zhang, 2012), entrepreneurial decisions (e.g., investment, employment; Berge, Bjorvatn, Garcia Pires, & Tungodden, 2015), and earnings (Reuben, Sapienza, & Zingales, 2015). Thus, competitive preferences may contribute to gender differences in labor market outcomes (Blau & Kahn, 2017). ~~As such, it is important for organizations to take gender differences in competitiveness into consideration when striving to facilitate gender equality in workplace outcomes.~~

Both confidence and risk attitudes have been implicated in driving the gender gap in willingness to compete (Niederle & Vesterlund, 2011; Veldhuizen, 2017). For instance, in the original study by Nierderle and Vesterlund (2007) men were X% more overconfident than women about their relative performance on the task, and these beliefs predicted participants’ entry into tournaments.

Confidence is conceptualized as the accuracy of one’s perceived performance or ability on a task (Beyer & Bowden, 1997). Within the literature on the gender gap in competitiveness, confidence is operationalized as the belief about one’s relative performance during a competition, where individuals who have inaccurately high (low) ratings of their performance are deemed overconfident (underconfident). If an individual does not believe their performance is higher than the individuals they are competing against, they are unlikely to make the decision to compete for fear of missing the opportunity to earn money.

While most individuals are overconfident, there is ample research to suggest that women are less overconfident, on average, than men across a number of domains (Bertrand, 2010; Beyer, 1990; Beyer & Bowden, 1997; Croson & Gneezy, 2009; Lundeberg, Fox, & Puncochaf, 1994; Mobius, Niederle, Niehaus, & Rosenblat, 2011; Niederle & Vesterlund, 2007, 2011). Because women are less overconfident, they compete less often than they should, given their actual ability (Niederle & Vesterlund, 2007). Confidence too may help explain why, in some situations, the gender gap in competitiveness may be reduced or eliminated. For instance, women tend to compete more when tasks are female-typed or gender-neutral (Apicella & Dreber, 2015; Boschini, Dreber, Essen, Muren, & Ranehill, 2019, 2014; Dreber, Essen, & Ranehill, 2011; Dreber et al., 2014; Grosse & Riener, 2010; Günther, Ekinci, Schwieren, & Strobel, 2010; Iriberri & Rey-Biel, 2017; Shurchkov, 2012), when they are facing other female opponents (do you have a cite for this? maybe see, Datta Gupta et al., 2013; Booth & Nolan 2012?) or when competing against themselves (cite my paper with johanna and elif). For instance, Apicella et. al. document a gender difference in confidence when women and men are competing against other individuals, but not when they are competing against themselves­ (i.e., their own past performance). There are several non-mutually exclusive and potentially interacting explanations that could account for women’s relatively lower (over)confidence, including differences in performance or ability, experience, innate psychological differences, and stereotype threat. In the latter case, for instance, women may decide to forgo competitions because they either believe negative stereotypes about their ability to perform certain tasks, or because stereotypes provoke enough anxiety to reduce confidence (Grosse & Riener, 2010; Günther et al., 2010; Iriberri & Rey-Biel, 2017; Shurchkov, 2012). Taken together, this body of research suggests that interventions designed to increase confidence in women, may embolden them to compete more.

~~Indeed, the literature on stereotype threat (Spencer, Logel, & Davies, 2016; Spencer, Steele, & Quinn, 1999; Steele, 1997) also negative stereotypes about women’s ability to perform male-typed tasks (e.g., math, mental rotation) may undermine confidence and affect performance. As a result,~~ Again,

A second variable that has been identified as a possible explanation for gender differences in competitiveness is risk attitude, typically construed as the preference for a certain gain over a gamble, even if the gamble has an equal or greater monetary expectation (Kahneman & Tversky, 1982). ~~Several studies across diverse settings have documented a gender difference in risk attitudes, where women tend to be more risk-averse than men on average (Apicella et al., 2017a; Bertrand, 2010; Croson & Gneezy, 2009).~~ Competitive payment schemes are inherently riskier than piece-rate payment schemes because the variance in returns is greater. With piece-rate payment schemes, individuals are guaranteed a certain amount for every unit they produce. Moreover, there typically exists uncertainty in competitions since one’s relative performance is unknown (Niederle & Vesterlund, 2011). Researchers investigating gender differences in risk attitudes find that men are typically more risk-seeking than women (e.g., Eckel and Grossman 2008, Charness and Gneezy 2012; Croson and Gneezy 2009 for a survey), including in hunter-gatherers (cite apicella), but see Harrison et al (2007) for an exception. While most studies report a gender difference, the difference appears to be small (cite) and culturally-dependent (cite gneezy’s matrilineal/patrilineal papers). Indeed, some of the gender gap in competitiveness is explained by men and women’s differing risk attitudes (cite a nierderle review perhaps). In fact, some recent work suggests that nearly 30% of the gender gap in competitive choices can be explained by risk attitude (Gillen et al., 2019; van Veldhuizen, 2017).

The extent to which confidence and risk attitudes account for the gender differences in willingness to compete is debated. The seminal research in this literature suggests that confidence and risk attitude do not completely explain gender differences in competitiveness, since there remained a residual gap after controlling for these factors (Niederle & Vesterlund, 2007). The unexplained component of the original gender effect was then taken as evidence of a distinct “competitiveness” trait, separate from risk attitude and confidence (Niederle & Vesterlund, 2007, 2011). However, recent work correcting for measurement error (Gillen, Snowberg, & Yariv, 2019) and using experimental techniques to isolate the effects of the competitiveness trait (Veldhuizen, 2017) suggests that risk attitude and confidence may fully explain the gender gap in the choice to compete. Regardless of whether competitiveness is a “stand-alone” trait, it is clear that both confidence and risk attitude can generate differences in how men and women react to competitions. As such, interventions designed to increase women’s confidence and decrease their perceptions of risk and uncertainty in competitive contexts may help reduce the gender gap in competitiveness.

In the current study, we examine whether and how preparation may influence willingness to compete. Confidence on a task may improve with preparation and training (Gist & Mitchell, 1992; Schunk, 1981, 1982; Usher & Pajares, 2008), since, in most cases, people are able to observe a gradual improvement in their skills over time. For instance, Lent, Brown, Gover, and Nijjer (1996) found that college students listed past accomplishments as the most influential factor in determining their confidence. Other research directly compared the effects of mastery experiences, vicarious experiences (e.g., watching others perform a task), and a control treatment without any intervention on confidence, finding that mastery increased confidence significantly more than vicarious experiences and the control treatment (Bandura, Adams, & Beyer, 1977). Based on previous evidence of the benefits of enactive mastery through preparation and training on confidence, providing women with an adequate opportunity to prepare before a task may alleviate the gender gap in choice to compete.

Preparation and the feelings of preparedness that follow, may also decrease the perceived riskiness of competitions. Again, little work has examined this. However, it is interesting to note that risk attitudes play a greater role in predicting decisions to compete when individuals are competing against other individuals, rather than themselves (i.e., their own past performance), possibly because there is more uncertainty in estimating an opponent’s ability versus one’s own ability (cite Apicella, demiral mollerstrom first paper). Surprisingly, little work has explored how preparation impacts men and women’s confidence, risk, or their willingness to compete.

In the first experiment, we test whether simply knowing that there will be an opportunity to prepare before performing a task affects the gender gap in willingness to compete. That is, we manipulate participants’ knowledge of whether they will have time to prepare before they make their decision to compete. In the second experiment…. Finally, in experiment 3…

We anticipate that participants with this information would be more inclined to compete compared to participants without this information and …. Thus, we expected an interaction between gender and condition on the choice to compete, along with a main effect of condition. In the second experiment, we examined how actual preparation influences the decision to compete. That is, we manipulated whether participants were required to prepare before making the decision to compete. Again, we expected that women in the preparation condition would be especially inclined to compete. Notably, both knowing about an opportunity to prepare before competing and the actual act of preparing may encourage high-ability women to enter competitions more often. In knowing one can prepare beforehand, one may assume that they can resolve any discrepancies between their current ability and their desired ability level for competition by preparing or that xxxx . This knowledge, in and of itself, may be sufficient to reduce gender differences in competitiveness, regardless of whether women actually take advantage of this opportunity. Additionally, the act of preparation may be uniquely motivating, since preparation allows an individual to observe an improvement in their performance over time and xxxx. As such, women may choose to compete more after preparing or practicing a task.

In both experiments, we measured gender differences in actual preparation after administering the treatment and eliciting preferences to compete. In experiment 1, all participants had an opportunity to prepare after deciding whether to compete. In experiment 2, Finally, we monetarily incentivized participants in both studies to correctly predict which gender would prepare and compete more. The research design, hypotheses, measures and analyses were preregistered (<https://osf.io/q39a5/>) unless otherwise stated and all analyses were conducted in R statistical software (version 4.0.3).

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