Economics of Education Review 48 (2015) 117–128

Contents lists available at ScienceDirect

Economics of Education Review

journal homepage: www.elsevier.com/locate/econedurev

Are females scared of competing with males? Results from a field experiment

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ARTICLE INFO

Article history:
Received 16 July 2014
Revised 4 June 2015
Accepted 9 June 2015
Available online 20 June 2015

JEL classification:
J71
M51
J16
C93

Keywords:
Gender differences
Attitude toward competition
Psychological differences
Tournaments
Field experiment
Student achievements

ABSTRACT

We conducted a field experiment involving 720 Italian undergraduate students to investigate the existence of gender differences in performance in competitive settings and whether performance is affected by one's opponent gender. The experimental design was aimed at neutralizing other differences in psychological attitudes, such as self-confidence and risk aversion, that are typically considered as potential explanations of gender differences in competitive environments. Students were invited to undertake a midterm exam under a tournament scheme having as a prize some bonus points to add to the final grade. Students competed in pairs of equal predicted ability but different gender composition. In a competitive setting in which risk aversion, feedback provision and self-confidence have little relevance, we find that women tend to perform similarly to men. The gender of one's competitor does not play any role in shaping students' behavior. Men and women perform similarly both in the competitive and in the non-competitive environment.

1. Introduction

Men and women continue to differ in many social and economic outcomes: employment perspectives, earnings, job career, access to highly paid jobs and top positions, field of study choice, participation in political activities, and so on (Altonji & Blank, 1999; Bertrand & Hallock, 2001; Blau & Kahn, 2006; Goldin, Katz, & Kuziemko, 2006).

A recent strand of the literature goes beyond the traditional explanations based on statistical and taste discrimination and traces the causes of the gender gap in labor market outcomes in differences in psychological attitudes and preferences. According to a number of recent studies women are more risk-averse, less self-confident, more altruistic and more reluctant to engage in competitions (Bertrand, 2011).

Gender differences in attitudes toward competition have received particular attention and have been explored by many studies in recent years. Three main questions have been investigated in this literature: are women less likely to choose competitive settings than men? Are women less effective in competitions compared to men? Do women underperform when they compete against men?

Some laboratory studies suggest that women, even the most able, prefer to stay away from competitive environments. Furthermore, these studies show that women taking part to a competition often under-perform relative to men, even if they are able to perform similarly to men in non-competitive situations, and that the female disadvantage

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http://dx.doi.org/10.1016/j.econedurev.2015.06.002
0272-7757/

is particularly large when females compete against males rather than against other females. However, some lab experiments fail to confirm this evidence (see Section 2).

Results from field experiments are even more mixed: while some works confirm that in real life situations women underperform relative to men in competitive settings, other studies do not find any gender difference in performance.[1]

In this paper, we try to shed some more light on gender differences in competitive environments and on the role played by one's opponent gender. We study both the individuals' propensity to participate in a competition and their performance in competitive settings. At this aim, we conducted a field experiment introducing competition in the context of a university exam. The experiment involved 720 undergraduate students enrolled at an Italian university and attending three economic courses in the academic year 2012–2013.

We proposed students to take part in a tournament, in which they sit a mid-term exam consisting in questions on the first part of their course program. Students accepting to participate in the experiment were matched in pairs within each class on the basis of their predicted performance leading to pairs of students with comparable ability. Since students were matched independently from their gender we ended up with single-sex and mixed sex couples of competitors. Within each pair the student getting the highest mark at the mid-term exam obtained a bonus of 5 points to add to the grade gained at the final exam; on the other hand, the student scoring the lowest mark obtained a bonus of 2 points (the bonuses were conditional on the reaching of a minimum threshold of 33% of correct answers).

Students could choose whether to join the experiment with the possibility of obtaining the bonuses or not. At the end of the course, both students participating in the tournament and those deciding to not compete had to take the same final exam covering the entire course program. The final grade was determined either by the points obtained at the final exam (for students not participating in the experiment or not gaining any bonus) or by the sum of final exam points plus the bonus earned at the tournament.

This setting allows us to observe students' performance both in a competitive setting (the mid-term exam), in which students compete one against the other, and in a non-competitive setting (the final exam), where students are rewarded following a sort of piece-rate scheme in which their grade only depends on their own performance.

Our experiment introduces competition in a real life situation. Compared to laboratory studies, our work has the advantage of considering individuals' performance in a task that is familiar to them and is part of their daily life. The design of our experiment aims to neutralize a number of factors that are typically considered as potential explanations of gender differences in competitive environments: a) participants' expectations about their relative abilities; b) risk aversion; c) attitudes toward feedbacks on relative performance; d) stereotypical female or male task. First, in our setting individuals were unlikely to differ in their expectations about their own relative ability because we provided participants with accurate information. In our experiment, an informed subject (students' professor) explained to students that competition would have taken place among competitors of comparable ability, as resulting from their predicted performance based on students' academic achievements and characteristics (high school grade, type of high school, performance at previous related exams and so on). This information should have reassured students that their own ability is as high as their opponents' ability. Gender differences in the degree of confidence should therefore play no role in this setting.

Second, we framed the decision to compete as a risk-free choice. Indeed, in our setting, students participating in the tournament do not face the risk of a negative payoff in case of losing the competition and they do not have to renounce to the rewards related to the piece-rate scheme because the final grade at the exam is given by the points earned at the final exam plus the points obtained in the tournament.

Third, in our experiment individuals received a feedback about their performance, in terms of score obtained, both in the competitive (mid-term) and in the non-competitive (final exam) setting. The grade obtained by all students in both the tournament and the final exam was revealed publicly by publishing it on line on the courses' webpages. Publishing on line students' grades is a practice followed in all examination sessions at this university. This feedback rule excludes the possibility that individuals renounce to participate in the tournament because they dislike to be compared to their peers. Finally, the task we propose in the tournament – studying economics subjects and answering questions about the course program – is not a stereotypical female or male task. Our sample students are enrolled in a Degree Course in Business and Administration which is typically attended by males and females on a quite balanced proportion.

Therefore, our experiment provides new evidence on gender differences in competitive behavior, which might be valuable given the quite mixed results emerging from existing studies.

We firstly focus on participation decisions, which take place in two stages. In a first stage, after experiment rules were announced, students decided whether to join the tournament. In a second stage, after about six weeks, the mid-term exam (*i.e.* the tournament) took place and students (knowing the identity of their opponent) decided whether to effectively show up at the tournament. About 85% of students decided to take part in the experiment. However, about 10% of the students who initially joined the experiment did not show up at the mid-term exam. We do not find gender differences in any of the two participation decisions. Furthermore, we do not find any significant effect of one's opponent gender on the decision of not showing up the day of the tournament.

By analyzing students' performance in the competitive setting, we find that females tend to perform slightly better than males. It also emerges that the gender of the competitor does not produce any statistically significant effect on students' performance. In the final exam (under a piece rate scheme), we again find that females tend to perform better than males. Finally, by comparing each student's performance under the two schemes (with individual fixed effects), we confirm that females do not perform worse (and, if anything, they perform better) than males in competitive settings.

[1] We refer to three extensive reviews for detailed information: Croson and Gneezy (2009); Bertrand (2011); Niederle and Vesterlund (2011).