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Who performs better under time pressure? Results from a field experiment ☆

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ABSTRACT

We investigate whether and how time pressure affects performance. We conducted a field experiment in which students from an Italian University are proposed to choose between two exam schemes: a standard scheme without time pressure and an alternative scheme consisting of two written intermediate tests, one of which to be taken under time pressure. Students deciding to sustain the alternative exam are randomly assigned to a "time pressure" and a "no time pressure" group. Students performing under time pressure at the first test perform in absence of time pressure at the second test and vice versa. We find that being exposed to time pressure exerts a negative and statistically significant impact on students' performance. The effect is driven by a strong negative impact on females' performance, while there is no statistically significant effect on males. Both the quantity and quality of females' work is hampered by time pressure. Using data on students' expectations, we also find that the effect produced by time pressure on performance was correctly perceived by students. Female students expect a lower grade when working under time pressure, while males do not. These findings contribute to explain why women tend to shy away from jobs and careers involving time pressure.

1. Introduction

Economic decisions are often taken under time pressure. Individuals taking part in negotiations and having to decide quickly whether to accept or refuse an offer experience time pressure; so do people buying products which are available only in limited quantity. Trading decisions in financial markets are also subject to severe time pressure. Similar pressure is faced

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in many occasions by managers deciding about business strategies or by people bidding in auctions. Researchers themselves face time pressure in their activity since someone else could come up with the same idea.

Performance in such jobs is likely to be affected by the stress arising from the need to cope with limited time. In our paper we look at a real life situation, that is students sitting their final exam, to investigate how and to what extent being exposed to time pressure affects individual performance and whether there is heterogeneity in the ability to handle time pressure.

The psychological literature has long investigated the effects produced by time pressure on individual decisions showing that time pressure is detrimental for decision quality (Busemeyer & Diederich, 2002; Diederich, 1997; Diederich & Busemeyer, 2003). Such a negative effect of time pressure is related to the worsening of the reasoning process and to individuals' tendency to ignore important information and rely on heuristics (Gigerenzer and Todd, 1999; Kruglanski & Freund, 1983; Rieskamp & Hoffrage, 2008).

In spite of the importance that time pressure has in many economic decisions, economists have typically ignored this issue. Only recently, a small number of papers have devoted attention to the impact of time pressure on individual decisions. Kocher and Sutter (2006) run a laboratory experiment using the beauty-contest game to investigate the existence of a trade-off between the quality of decision-making and time pressure and the effect exerted by time-dependent incentive schemes on such a trade-off. They show that, in absence of a time-dependent incentive scheme, the depth of reasoning decreases under time pressure even in interactive contexts. Similarly, Sutter, Kocher, and Strauß (2003) examine the effects of time pressure on bargaining behavior in an ultimatum game, showing that time pressure has high efficiency costs by leading to significantly higher rejection rates of offers, despite the effect vanishes with repetition. Kocher, Pahlke, and Trautmann (2013) and Bollard, Liu, Nursimulu, Rangel, and Bossaerts (2007) find that time pressure changes individual attitudes toward risk. In addition, time pressure can change individual behavior by rising physiological stress, which in turn increases risk taking (Buckert, Schwieren, Kudielka, & Fiebach, 2014; Putman, Antypa, Crysovergi, & van der Does, 2010; Starcke, Wolf, Markowitsch, & Brand, 2008) and inhibits strategic thinking (Leder, Häusser, & Mojzisch, 2013).

Even less is known on gender differences in response to time pressure. Some psychological studies (see Voyer, 2011 for a review) show that in some cognitive tests (such as mental rotation tasks) gender differences in favor of men are significantly larger when the task is administered with time constraints compared to when such constraints are absent. Shurchkov (2012) shows that among factors that make women less effective than men in certain competitive environments (Gneezy, Niederle, & Rustichini, 2003; Niederle & Vesterlund, 2007) a crucial role is played by the ability to handle time pressure. In a laboratory experiment, she finds that gender inequality in performance is due to men and women reacting differently to time pressure: women perform significantly better than men in competitive verbal tasks without time constraints.

Understanding whether males and females react differently to time pressure is relevant to contribute to explain why women, even if as educated as men, continue to be heavily under-represented in many professions involving risky and high-pressure activities, such as executives financial traders and entrepreneurs. An increasing literature documents how gender differences in preferences have a role in explaining gender differences in economic and social outcomes (Bertrand, 2011; Croson & Gneezy, 2009; De Paola, Gioia, & Scoppa, 2014; Niederle & Vesterlund, 2011). Adding to this literature, in our work we focus on gender differences in the ability to handle time pressure: these differences, as those in attitudes towards competition, risk aversion, time and social preferences, already widely investigated by the economic literature, might help at explaining job sorting and labor market outcomes.

Compared to many of the existing works on gender differences in preferences and in the ability of dealing with time pressure that rely on laboratory experiments, we run a field experiment allowing us to observe individuals in a real life environment, in which they have strong incentives to perform well.[1] Even if laboratory experiments allow researchers to have full control of important determinants of the phenomenon under study, participants typically face situations that are far from real-life situations. Our field experiment is thus relevant to understand individuals' behavior in a real setting and see if it is similar to the behavior observed in a laboratory.

Our experiment has involved 220 undergraduates who were given the opportunity to choose whether to sit the final exam of one course according to the standard scheme (consisting of a single test on the whole program to be taken at the end of the course) or to an alternative scheme consisting of two intermediate tests (to sit right after the first half of the course and at the end of it, respectively) one of which to be taken under time pressure.

Students deciding to sit the exam according to the alternative examination scheme were randomly assigned, on the basis of a stratified assignment procedure, to a treatment group having to work under "time pressure" and a control "no time pressure" group. Groups were switched for the second test in order to guarantee identical treatment to students during the exam. Moreover, students were given the opportunity to switch back to the standard exam at any point.

220 students joined the experiment. 182 showed up at the first test and 144 out of 182 showed up also at the second test. The choice to take the first test was not related to the treatment status because time limits were announced to students immediately before the start of the first test. Instead, the decision to take also the second intermediate test was strongly influenced by the treatment status.

Using data on students' performance at the first test, we find that students working under time pressure obtain an average grade of about 10% of the maximum score obtainable (3/32 points) lower than the grade achieved by students working in

[1] Paserman (2010) and Gonzalez-Diaz, Gossner, and Rogers (2012) study the effect of pressure in the field looking at competitive environments (i.e. tennis tournaments).