European Economic Review 90 (2016) 336–349

Contents lists available at ScienceDirect

European Economic Review

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

How competitiveness may cause a gender wage gap: Experimental evidence

Matthias Heinz [a,1], Hans-Theo Normann [b,2], Holger A. Rau [c,*]

[a] University of Cologne, Germany
[b] Duesseldorf Institute for Competition Economics (DICE), Germany
[c] University of Göttingen, Germany

ARTICLE INFO

Available online 2 March 2016

JEL classification:
C91
J16
M52

Keywords:
Dictator game
Discrimination
Gender wage gap
Laboratory experiment
Real-effort task

ABSTRACT

We show that choices in competitive behavior may entail a gender wage gap. In our experiments, employees first choose a remuneration scheme (competitive tournament vs. piece rate) and then conduct a real-effort task. Employers know the pie size the employee has generated, the remuneration scheme chosen, and the employee's gender. Employers then decide how the pie will be split, as in a dictator game. Whereas employers do not discriminate by gender when tournaments are chosen, they take substantially and significantly more from female employees who choose piece-rate remuneration. A discriminatory wage gap occurs which cannot be attributed to employees' performance.

1. Introduction

Experimental research has repeatedly documented that women and men differ in their inclination to compete. Niederle and Vesterlund (2007) show that women tend to shy away from competition: they choose a competitive environment less often than men, even though they perform the underlying task equally well (see also Niederle et al., 2012). Dohmen and Falk (2011) find in a remuneration-choice experiment that women prefer fixed wages to a higher extent than men.[3,4] In a field experiment with children, Gneezy and Rustichini (2004) find that competition enhances the performance of males only (which is not the case in Niederle and Vesterlund, 2007). Altogether, the evidence suggests that women tend to avoid competition whereas men embrace it (see Croson and Gneezy, 2009, for a survey of this literature).

In light of these results, it has been suggested that differences in competitiveness may entail pay gaps (Sutter and Rützler, 2010; Dohmen and Falk, 2011; Flory et al., 2016). If men choose competitive (better paid) environments more often, a wage gap emerges even when women and men perform equally well. Shying away from competitive environments may lead to

* Corresponding author. Tel.: +49 551 39 22281.
E-mail addresses: heinz@wiso.uni-koeln.de (M. Heinz), normann@dice.hhu.de (H.-T. Normann), holger.rau@uni-goettingen.de (H.A. Rau).
[1] Tel.: +49 221 470 7263.
[2] Tel.: +49 211 8115297.

[3] Gneezy et al. (2009) show in a field setting that women's competitiveness strongly depends on the nature of the societies investigated (matrilineal vs. patriarchal). See also Hoffman et al. (2011).

[4] The issue that women sometimes perform less well in competitive environments can be related to the remuneration choices. Gneezy et al. (2003) show that women may be less effective than men in competitive environments even if they perform equally well in non-competitive settings.

http://dx.doi.org/10.1016/j.euroecorev.2016.02.011
0014-2921/

women missing opportunities for better paid jobs.[5] Thus, the differences in the attitude toward competition may cause a gender wage gap.

At first sight, it may appear that such a wage gap due to differences in the attitude toward competition would not be discriminatory as it would be consistent with the *equal pay for equal work* principle. Generally, various explanations have been proposed for the gender wage gap (Blau and Kahn, 1992, 1994; Fryer and Levitt, 2010): performance-based explanations refer to differences in, for example, education, skills, and occupational choices, but the wage gap may also result from discrimination when equally qualified and equally performing men and women are paid differently. It seems that a gender pay gap due to differences in the inclination to compete would fall into the group of non-discriminatory explanations as it is performance based.

In this paper we argue that gender differences in the attitude toward competition may bring along an additional discriminatory effect. In the aforementioned experiments, the payments for the different remuneration schemes are exogenously fixed and do not allow for discrimination by gender. Within the remuneration schemes, there is equal pay for equal work by design. In settings relevant in the field, this may not always be the case as remuneration is often flexible (bonuses, negotiations, award of perks, etc.)[6] and is determined by superiors with the discretion to decide. If so, the remuneration decisions itself and the interaction with gender may play a role. How do employers reward performance given the choice for either competitive or non-competitive remuneration by females and males? The novelty of our experiments is that we allow for an *adjusted* wage gap to emerge (whereas in existing experiments the adjusted wage gap is inevitably zero). When superiors use their discretion to decide on payments, discrimination beyond what can be justified based on performance may result.

The goal of our research can also be put this way. The previous experimental literature mostly focused on the supply side (Bohnet et al., 2012, is an exception, see below). These papers analyze whether men and women differ in their labor supply decisions by way of their attitudes toward competitive environments. We mainly look at the demand side—the employers—and at the interaction between the supply and the demand side. We investigate how employers react to tournament vs. piece-rate choices by women and men.

To investigate this research question, we use a laboratory experiment with more than 600 participants. As in previous experiments, employees' choices and performances determine the pie size: they first choose a remuneration scheme (competitive tournament vs. piece rate) and then they conduct a real-effort task. This part of the experiment is similar to Niederle and Vesterlund (2007). We add to this a dictator-game stage (for example, Hoffman et al., 1996; Eckel and Grossman, 1998)[7] where the pie is generated by the employees (recipients) and where employers (dictators) decide how much to take from the pie.[8] When deciding, employers know the pie size, the remuneration choice, and the employee's gender. While this design is perhaps extreme in that employers have 100% discretion, it is suitable for identifying discriminatory effects which previous experimental research could not detect. We also conduct a control treatment where the remuneration scheme is determined by a random computer move.

Our findings are as follows. When the employees decide to work under piece rate, employers take substantially and significantly more from female workers. By contrast, employers do not discriminate based on gender when tournaments are chosen. Neither do they discriminate against women when the payment scheme is imposed by a random computer move. We thus observe a discriminatory wage gap which cannot be attributed to performance.

2. Experimental design

Our design combines the remuneration-choice experiments of Niederle and Vesterlund (2007) with a real-effort dictator game (Ruffle, 1998; Konow, 2000; Cherry et al., 2002). The first two stages are similar to "Task 3—Choice of Compensation Scheme" of Niederle and Vesterlund (2007) where subjects first choose a remuneration scheme and afterwards take part in a real-effort task. We add a third stage where a dictator game is played: dictators (employers) decide how to split the pie, and the recipients (employees) determine the pie size in the mathematical real-effort task.[9]

The game is played only once, and the timing is as follows:

[5] Buser et al. (2014) show that boys more frequently choose academic tracks which are math- and science-intensive as compared to women. It turns out that differences in competitiveness account for a large portion of the gender differences in track choices.

[6] On gender effects regarding negotiations and wage expectations, see Bowles and McGinn (2008), Rigdon (2012), and Babcock and Laschever (2003) which are discussed below.

[7] Other dictator games include, for instance, Cherry et al. (2002) and Cappelen et al. (2007). Erkal et al. (2011) analyze a multi-player, real-effort dictator game. Brock et al. (2013) and Cappelen et al. (2013) investigate dictator decisions involving risks.

[8] Dictator game experiments with earned money (real-effort experiments) were suggested by Ruffle (1998) where the performance of recipients in a general-knowledge contest determined the total surplus. In Cherry et al. (2002) the real-effort task was done by the dictator. Oxoby and Spraggon (2008) analyze both dictator- and recipient-earned wealth, also using GMAT questions. Further, see Konow (2000) and Heinz et al. (2012) for real-effort dictator games.

[9] This stage is somewhat similar to Bosman and van Winden's (2002) power-to-take game where two players each earn an income in an individual real-effort task. One player (the authority) decides how much she will take away from the responder. In a second stage, the responder can punish the authority by destroying her own income. The transfer from the responder to the take authority is based on the responder's remaining income after the second stage.