

Balafoutas, Loukas; Davis, Brent J.; Sutter, Matthias

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Contact address of the editor:
Research platform "Empirical and Experimental Economics"
University of Innsbruck
Universitaetsstrasse 15
A-6020 Innsbruck
Austria
Tel: + 43 512 507 7171
Fax: + 43 512 507 2970
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Affirmative action or just discrimination? A study on the endogenous emergence of quotas[#]

Loukas Balafoutas^{a,*}, Brent Davis^a and Matthias Sutter^{b,a}

^a Department of Public Finance, University of Innsbruck.

^b Department of Economics, University of Cologne.

* Corresponding author. Universitätsstrasse 15, A-6020 Innsbruck, Austria.

Email: loukas.balafoutas@uibk.ac.at. Tel: +43 512 50771752. Fax: +43 512 5072788

Abstract

Affirmative action rules are often implemented to promote women on labor markets. Little is known, however, about how and whether such rules emerge endogenously in groups of potentially affected subjects. We experimentally investigate whether subjects vote for affirmative action rules, against, or abstain. If approved by the vote, a quota rule is implemented that favors women in one treatment, but members of an artificially created group based on random color assignment in another treatment. We find that quota rules based on gender are implemented frequently and do not affect the performance of men and women in a contest. Quota rules based on an arbitrary criterion, however, are less often approved and lead to strong individual reactions of advantaged and disadvantaged group members and to efficiency losses. These results show that the effects of affirmative action policies largely depend on whether these policies are viewed favorably within the affected groups.

JEL Codes: C91, C92, D03

Keywords: Affirmative action, competition, discrimination, experiment, voting

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1. Introduction

There is ample research demonstrating a gender gap in the labor market with respect to wages and career advancement (see, among others, McGree et al., 2015; Blau and Kahn, 2000, 2013; Weichselbaumer and Winter-Ebmer, 2007; Booth, 2009). Promotions based upon a rank-order tournament can further widen the gender gap (Blackaby et al., 2005). For instance, in a sample of U.S. firms, women only account for 2.5 percent of the five highest paid executives (Bertrand and Hallock, 2001). Recent research over the last decade has shown that women are generally less competitive than men, meaning that they are less willing to enter competitive environments and that they perform less well under competitive pressure (see, e.g., Gneezy et al., 2003; Niederle and Vesterlund, 2007; Croson and Gneezy, 2009; Andersen et al., 2013; Datta Gupta et al., 2013; Sutter and Glätzle-Rützler, 2015). This finding has been put forward as a potential factor contributing to the gender imbalances in the labor markets – in addition to factors such as discrimination or differences in preferences.

In light of the above, policy makers often design affirmative action programs that promote women in labor markets where they may face disadvantages. These policies typically take the form of quotas and their goal is not only to guarantee some level of representation of women in certain positions, but also to encourage them to compete for such positions by changing the rules of the game and improving their chances of success. For instance, as part of its Strategy for Equality between Women and Men (2010-2015), the European Commission has set the target to increase the share of women on corporate boards of large publicly listed companies in Europe to a minimum of 40 percent by 2020.¹

There is a recent literature examining the effect of affirmative action policies on tournament entry rates and on efficiency – defined as performance in a tournament and the way in which the tournament's winners are selected – in the laboratory. Balafoutas and Sutter (2012) examine several affirmative action policies and find that quotas and preferential treatment encourage women to enter competition without harming efficiency. Niederle et al. (2013) find that quotas are an effective instrument and do not entail efficiency costs. At the same time, Leibbrandt et al. (2015) present evidence that quotas are ineffective and also entail large costs when sabotage among peers is introduced into the picture. It is important to notice, however, that in all these studies affirmative action policies are exogenously implemented. In reality affirmative action policies are often endogenously implemented, and so far it has not been studied how this influences the performance of individuals affected by these programs and

¹ http://ec.europa.eu/news/justice/121114_1_en.htm

whether there is an interaction between performance, efficiency and the perceived legitimacy of introducing affirmative action policies.

In the political marketplace many political organizations implement their own affirmative action policies. Most European countries now have some quota rule(s) for women's representation either at the state or national level imposed legislatively or voluntarily through individual political parties. Examples of quota policies voluntarily implemented by political parties include Belgium (Meier, 2004), Germany, Iceland, Norway, Italy and Austria, among others (Dahlerup and Freidenvall, 2011).² Thus, although in many instances affirmative action policies are laid down exogenously, endogenous quota implementation is not an infrequent phenomenon. Moreover, adopting affirmative action policies at the level of national legislatures cannot be seen as completely exogenous to the preferences of individuals within the context of a representative democracy. Legal adoption of affirmative action policies through national legislatures via a vote requires support by a majority of the legislators, and indirectly by their electorate. Conversely, such policies are unlikely to be implemented if legislators or their electorate are strongly against them.

There are also voluntary movements within companies to support (more) equal representation of women at various hierarchy levels, irrespective of the political debate about mandatory quotas. One of the largest mobile and internet servicers in Europe, Orange, raised the minimum proportion of women in management committees to 35%.³ In 2001 Mastercard launched their "MasterCard Supplier Diversity Program" to promote diversity and equal opportunity among their suppliers, and have since expanded this program to the United Kingdom and Canada. To qualify for this diversity program, for-profit suppliers to MasterCard must have a minimum of being 51% owned by women, veterans, or minority groups.⁴ The above considerations support the motivation for our study and the idea that it is important to examine individual preferences for and reactions to affirmative action policies.

In this paper we provide experimental evidence on the willingness to support an affirmative action policy (a 50 percent quota for the advantaged group) and on the subsequent

² In fact, only 8 countries in the EU/EEA have legislated quotas (as of 2013) for women representation in national parliaments, while 16 have implemented quotas at the individual party level (Dahlerup and Freidenvall, p. 7, 2013). On occasion such quota proposals have been rejected. In 1998 the Scottish National Party considered a "zipping" policy where every other seat would be assigned to a female candidate; this proposal was rejected at the party conference by a vote of 257 in favor and 282 against (Russel et al. 2002, p.60). The Scottish Liberal Democrats also rejected a zipping quota rule in 1998 but instead approved a short-list quota policy, whereby a minimum number of the candidates considered to run for a vacant seat were to be women (Squires, 2005).

³ Press release from 10th edition of the Women's Forum Global Meetings. <http://www.orange.com/en/Press-and-medias/press-releases-2015/press-releases-2014/Orange-partner-of-the-Women-s-Forum-2014>

⁴ Global Diversity and Inclusion, MasterCard, 2012. https://www.mastercard.com/us/wce/PDF/diversity_brochure_final.pdf

emergence of such a policy, as well as on how the endogenous implementation of different affirmative action policies affects performance and efficiency. We study these questions in the framework of an experiment that implements a series of real-effort tournaments in groups of six subjects (three men and three women). The task is to count the number of zeros in a table of ones and zeros.⁵

Our paper adds to the literature on affirmative action policies in two main dimensions. First, whether an affirmative action policy is in place is endogenously determined by subjects through a pre-tournament vote at the group level: subjects can vote in favor of the policy intervention, against the policy intervention, or abstain. If at least one half of non-abstaining votes are in favor of the policy, it is implemented. This novelty of our experiment allows us not only to examine support for affirmative action policies among advantaged and disadvantaged group members, but also to determine how the endogenous emergence – or not – of such policies affects the performance of subjects. We measure performance during the tournament as well as in a post-tournament teamwork task. These two measures of performance have already been used as proxies for tournament and post-tournament efficiency in the literature (Balafoutas and Sutter, 2012; Sutter et al., 2015).

The second contribution is that we examine two kinds of affirmative action policies: one that discriminates along gender, and one that discriminates along an attribute randomly assigned in the laboratory. The *Gender* treatment guarantees that half the winners are female, while the *Color* treatment guarantees that half of the winners are “pink” group members after subjects (both male and female) have been randomly assigned to be either green or pink group members. Our rationale for this treatment variation is that we wanted to have one condition that mirrors affirmative action as it is implemented in reality to promote women, and to compare this with another condition in which the intervention is implemented along an artificial dimension such as random color assignment in the lab. This is important as it allows us to examine support for gender-related affirmative action in relation to an artificial, randomly assigned characteristic as benchmark of discrimination.⁶

An additional treatment variation concerns the cost of voting for or against the affirmative action policy. Advantaged (disadvantaged) subjects may be willing to support (oppose) the policy when voting is costless, but whether they are willing to pay a small amount

⁵ We chose this task in order to avoid stereotype threat, which might arise if one gender is perceived to perform better at the particular task.

⁶ Mollerstrom (2015) also studies how favoritism (by randomly assigning colors in the lab) affects economic behavior, in her case the level of cooperation in a public goods game. She finds that arbitrary favoritism reduces cooperation. While we do not find such an effect in our team production phase, we also show in the results that arbitrary affirmative action has efficiency costs.

to vote for or against the policy is less clear. We find that, when voting is costless, almost all women vote in favor of the policy intervention in *Gender*, while only half of pink (i.e., advantaged) group members do so in treatment *Color*. When voting is costly over half of all subjects abstain. Moreover, women as well as men are more willing to pay to vote (for or against the policy) in *Gender* than pink or green group members are in *Color*.

With respect to performance in and after the tournament and how it relates to affirmative action, our paper offers three main findings. First, when affirmative action favors women, it entails no efficiency costs measured by means of the total performance of (advantaged and disadvantaged) group members in the tournament or the performance of the two winners of the tournament. This extends the results of Balafoutas and Sutter (2012) and Niederle et al. (2013) to the case in which the intervention is not implemented exogenously, but emerges within the group as the result of a vote. Second, individual performances in treatment *Color* follow a pattern that is distinctly different compared to *Gender*: here, advantaged group members significantly increase their performance when the discriminating intervention is implemented, while disadvantaged group members significantly decrease their performance. We also show that, measuring tournament efficiency in terms of the two winners' performance, the implementation of affirmative action leads to an efficiency loss in the color treatment with costly voting. These findings indicate that the effects of affirmative action policies depend significantly on the acceptability of the factor that determines whether someone is advantaged or disadvantaged through affirmative action.⁷ Finally, as far as our measure of post-tournament efficiency is concerned, we find that performance in the post-tournament team task does not differ on aggregate depending on whether the policy is implemented, regardless of treatment.

2. Experimental Design

Our experimental design is similar to earlier studies on affirmative action and competition (Balafoutas and Sutter 2012; Niederle et al., 2013) but differs significantly in that the implementation of the policy is endogenous and there is no competition entry choice by subjects. All experimental sessions can be described as follows. Upon arrival subjects were seated and randomly assigned into groups of six persons. The gender composition of the groups depended on the treatment. In the *Gender* treatments subjects were randomly assigned into

⁷ Calsamiglia et al. (2013) examine the impact of affirmative action policies in a competition in solving Sudoku puzzles. They find that children with the highest ability in solving Sudoku puzzles in a disadvantaged group increase their performance under affirmative action at a lower rate than without affirmative action. In their study, the policy is exogenously implemented, while we study how endogenously chosen affirmative action affects behavior.

groups of three men and three women, while in the *Color* treatments subjects were randomly assigned to be a pink or green group member, and each group had three pink group members and three green group members.⁸ Subjects remained in the same group (and with the same role in the *Color* treatment) for the entire experiment. All of the above was common knowledge, but subjects did not know the identity of the other group members. They knew there would be four stages of a real effort task but were only introduced to each stage prior to its onset.

The task in Stages 1-4 was counting the number of 0s in a table of 1s and 0s with 100 digits, similar to Abeler et al. (2011). At the start of the experiment subjects went through a one-minute practice period to familiarize themselves with the task. In each subsequent stage subjects had five minutes to solve as many tables as possible. They moved to a new table once the current table had been completed. They could use scratch paper and pen but were not allowed to use calculators. The stages were as follows (Stages 1, 2, and 4 were identical across treatments):

Stage 1 – Piece Rate. Each subject received €0.50 for each table correctly solved within five minutes. At the end of the stage subjects were informed how many tables they had correctly solved and we also elicited the beliefs of all subjects regarding their relative performance (subjects were unaware of this until the end of Stage 1). In particular, we asked subjects where they believed they ranked in a hypothetical group of six subjects in the session based on the number of tables they had correctly solved. Correct guesses were rewarded with €1 each. Subjects were only informed about the outcome of their guesses at the end of the experiment.

Stage 2 – Tournament. In Stage 2 group members competed against one another. The two members who solved the most tables were paid €1.50 for each table completed. The other four group members did not receive any payment. Ties were broken randomly. Subjects were not informed of the outcome of Stage 2 until the end of the experiment, but were informed how many tables they had correctly solved. We also elicited beliefs about relative performance at the end of Stage 2 (again, this was not preannounced to subjects in the instructions), by asking subjects to guess their relative rank within their group and rewarding correct guesses with €1.

Stage 3 – Tournament with Possible Affirmative Action. At the beginning of Stage 3 subjects were given the chance to determine whether an affirmative action policy would be implemented.⁹ Subjects could vote for the tournament scheme with the affirmative action policy, the tournament with no intervention as in Stage 2, or abstain from the vote. If at least 50 percent of the votes cast – not including subjects who abstained – were in favor of the

⁸ No restrictions were placed on the gender composition in *Color*, but men and women each account for roughly half of the subjects in this treatment (51 percent men).

⁹ In the instructions this was framed as follows: voting for the same tournament as Stage 2 or for a new tournament called “Tournament-B”. This was done to eliminate any framing effects.

tournament with the intervention, the affirmative action policy was implemented; otherwise the tournament in Stage 3 was identical to Stage 2.¹⁰ If all subjects abstained the policy intervention was not implemented. Subjects were then informed about the outcome of the vote (the number of votes in favor of affirmative action, against it, and number of abstentions) and which tournament scheme was implemented prior to the start of Stage 3. Subjects were not informed how each specific group member had voted.

Treatments in Stage 3

We implemented two different affirmative action treatments in Stage 3. In treatment *Gender* at least one of the two winners in Stage 3 had to be a woman, so that the best performing of the three women in the group was certainly one of the winners, while the second winner could be either a woman or a man depending on performance. In treatment *Color* we implemented affirmative action not along gender but along the randomly allocated color, meaning that the best pink member was a winner for sure (and thus at least one of the winners in Stage 3 had to be a pink group member). Like in Stage 2, ties in Stage 3 were broken randomly.

We also varied the cost of voting for or against affirmative action policy: in the *No Cost* treatments voting was costless, while in the *Cost* treatments voting for or against the affirmative action policy cost €1 regardless of the outcome of the vote or the outcome of the tournament. Abstaining did not cost anything. The experiment was run in a 2 x 2 between-subjects design, so that each subject participated in only one of the four following treatments: either *Gender-No Cost*, *Gender-Cost*, *Color-No Cost*, or *Color-Cost*.

Stage 4 – Team Production. This stage was the same in all treatments and is based on the team task used in Sutter et al. (2015). Each table correctly produced by any team member earned €0.50 for the entire group and was split equally among all six members of the group. Accordingly, the individual payoff from producing one correct table was €0.083. We used this Stage to evaluate how teamwork and the willingness to contribute to the group were affected by whether the policy intervention was implemented or not, conditional on the type of the intervention (treatment *Gender* or *Color*) and on each subject's group affiliation (advantaged or disadvantaged group) and voting behavior.

Following Stage 4, subjects completed the Eckel-Grossman (2008) risk elicitation task as well as the Ring test from Offerman et al. (1996) to measure social preferences. At the end of

¹⁰ At this point we would like to stress that the focus of our study as discussed in the introduction and in our motivating examples is on environments where affirmative action emerges – or not – endogenously. Accordingly, quotas in our design will emerge if a group votes for them, and will not emerge otherwise. We therefore do not include treatments in which quotas are imposed exogenously or in which quotas are not possible.

the experiment subjects were informed about their performance and tournament outcomes in Stages 2-4 and completed a short questionnaire prior to payment.

The experiment was run with z-Tree (Fischbacher, 2007) at the University of Innsbruck in fall 2014. We recruited 354 subjects from various academic backgrounds using HROOT (Bock et al., 2014). We ran four sessions in each treatment, with either 18 or 24 subjects per session. All treatments had 15 groups of six subjects, except the *Gender-No Cost* treatment which had 14 groups. All subjects received a €4 show-up fee and were paid one randomly selected stage from the real effort tasks (Stages 1-4), earnings from correct guesses in the belief elicitation task, plus earnings from the risk and social preference tasks. Each session lasted approximately 60 minutes and average earnings were €14.70.

3. Results

3.1. Voting Behavior

Voting results by treatment are shown in Figure 1, first pooled across all group members and then broken down by advantaged (either women or pink group members) and disadvantaged (men or green group members) members. In *Gender*, voting behavior is generally consistent with subjects maximizing the probability of winning the tournament in Stage 3 when voting is costless. Men vote against affirmative action (henceforth also AA) 80.9% of the time, while women vote in favor of it 92.9% of the time. However, while approximately 80% of green (disadvantaged) members oppose the intervention in treatment *Color*, the behavior of the advantaged group in this treatment is markedly different. In particular, pink group members in *Color* vote for AA significantly less often than women in *Gender* (57.8% of the time, $p < 0.01$, Chi-Squared test). If we consider female group members only, pink group members who are women vote for AA in *Color* 63.6% of the time, significantly less frequently than women in *Gender* ($p < 0.01$, Chi-Squared test). Furthermore, there is no difference in voting behavior between men and women who are pink group members in *Color* ($p = 0.44$, Chi-Squared test). Hence, voting behavior in *Color* is less consistent with maximizing the probability of winning, in the sense that a substantial proportion of advantaged subjects do not support the intervention.¹¹ When voting is costless, 37.8% of pink group members actually vote *against* the intervention and 4.44% abstain.¹²

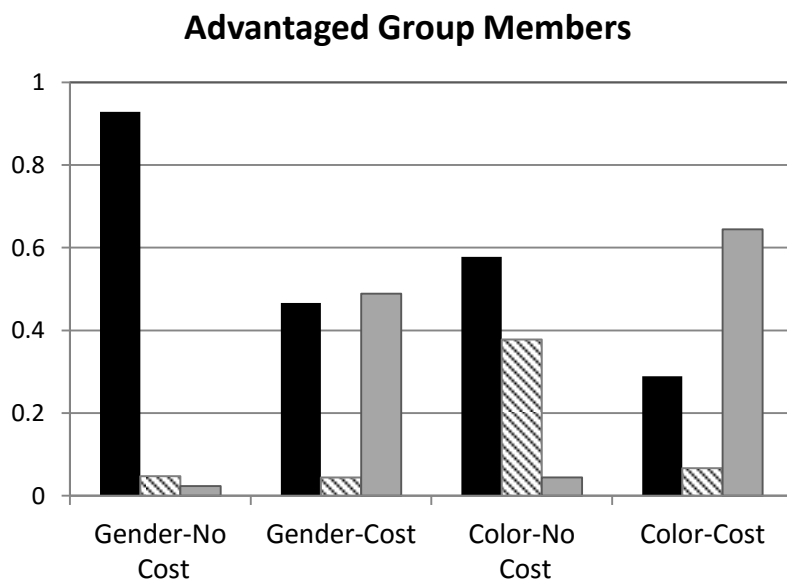
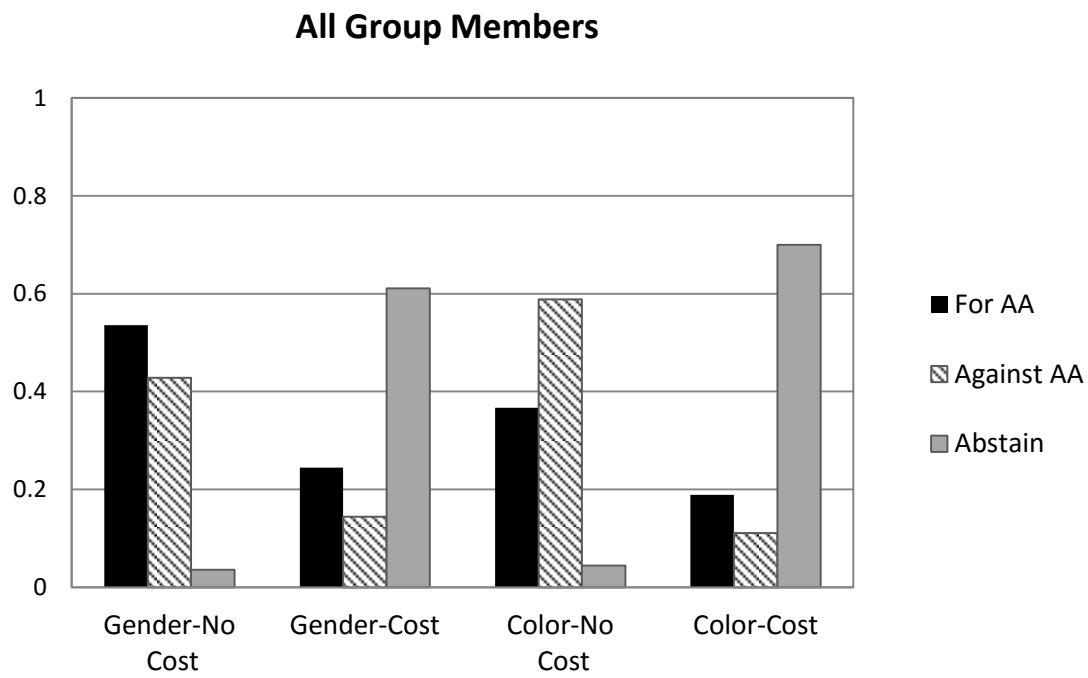
¹¹ Voting behavior is not correlated with risk preferences or results from the Ring test.

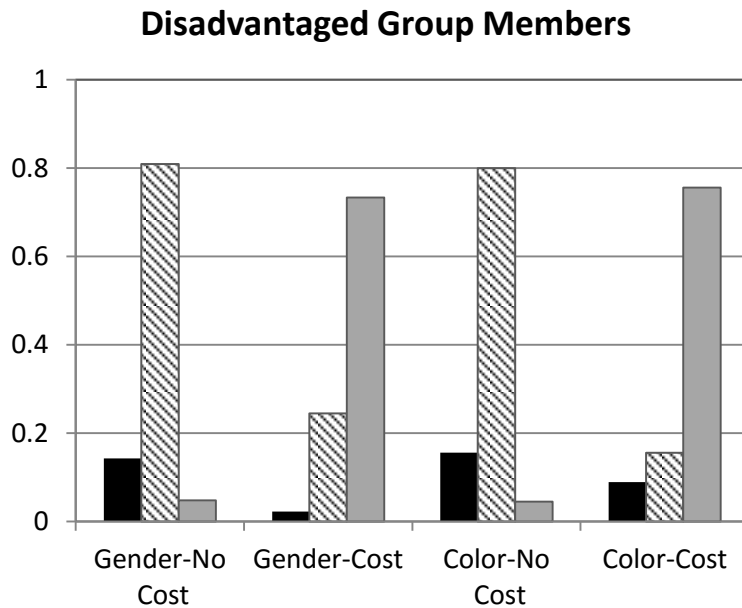
¹² At the same time, we must note that the share of disadvantaged group members supporting the intervention is not negligible either (14.3% of men in *Gender*; 15.6% of green members in *Color*).

Not surprisingly, participation in the vote decreases dramatically when voting becomes costly. Advantaged group members, for instance, are willing to pay to support AA only 37.8% of the time overall, compared to 74.7% when voting is costless, and disadvantaged group members decrease voting against AA from 80.5% to only 20% of the time ($p < 0.01$ for both differences, Chi-Squared tests). Women in *Gender* still vote for AA more frequently than advantaged group members do in *Color* when voting is costly (46.7% vs. 28.9%), although this difference is no longer significant ($p = 0.16$). Furthermore, women abstain less often when voting is costly (and are more willing to pay for a vote) than men in *Gender* (48.9% compared to 73.3%, $p=0.02$). This difference does not extend to the *Color* treatment, in which pink and green group members are equally likely to abstain when voting is costly.

Overall, we see that – in the *Cost* as well as in the *No Cost* treatments – support for the affirmative action intervention is much lower among the advantaged group in *Color* than in *Gender*, despite the fact that the incentives are the same for self-interested individuals. An intuitive explanation for this finding is that affirmative action along gender is seen as acceptable by a sizeable proportion of subjects, while favoring pink over green group members cannot be justified in any reasonable way and must be considered a discriminatory practice even among advantaged group members. We will return to a discussion of this issue in section 4.

Figure 1. Voting behavior – relative frequency of voting for or against AA or abstaining from the vote





3.2. Implementation of the Affirmative Action Policy

The policy intervention is implemented in 69.5% of all groups in the experiment. It is implemented more often – although only marginally significantly so – in *Gender* than in *Color* (79.3% vs. 60% of the time, $p = 0.10$, Chi-Squared test). This is of course a direct implication of the voting behavior described above and fully in line with the idea that there is more support for affirmative action when it is implemented along the gender dimension and not along an artificially created and randomly assigned characteristic (see also Table 1 for the mean number of group members voting in favor, against, or abstaining). AA implementation in the *Gender* treatments does not differ significantly depending on whether voting is costly (85.7% in *Gender-No Cost* and 73.3% in *Gender-Cost*), given that the number of group members voting for and against AA both decrease in the cost treatment. However, since the majority of green group members abstain when voting is costly and a few pink group member vote in favor, AA is implemented more often in *Color-Cost* (73.3%) than in *Color-No Cost* (46.7%), but the effect is not quite significant either ($p=0.13$, Chi-squared test).

Table 1. Mean Number of Votes within a Group of Six Subjects

	<i>Gender</i>		<i>Color</i>	
	<i>No Cost</i>	<i>Cost</i>	<i>No Cost</i>	<i>Cost</i>
In Favor (Yes)	3.21 (0.08)	1.47 (0.11)	2.20 (0.12)	1.13 (0.09)
Against (No)	2.57 (0.08)	0.87 (0.08)	3.53 (0.11)	0.67 (0.09)
Abstain	0.21 (0.05)	3.67 (0.11)	2.67 (0.06)	4.20 (0.11)

Standard errors in parentheses.

3.3. Performance

Summary statistics for mean performance in the real-effort task in all four stages are provided in Table 2. In both the piece rate (Stage 1) and the tournament in Stage 2 there is no significant difference between men and women ($p = 0.51$, Mann-Whitney test), indicating that the task is indeed gender neutral. The mean number of tables produced in Stage 2 is higher – as expected, due to practice and to the effects of competitive pressure – compared to the mean number of correct tables in Stage 1 ($p < 0.01$, Mann-Whitney test).

Table 2. Task Summary Statistics

Stage	Mean (Correct tables)	Standard Error	Min	Max
1	6.91	0.15	0	19
2	8.19	0.16	0	19
3	8.64	0.16	0	18
4	8.77	0.16	0	19

Table 3 displays mean performance in the tournament of Stage 3 by treatment and policy implementation, for advantaged and disadvantaged group members. Overall, performance in *Gender* is slightly lower when AA is implemented: subjects produce a mean of 8.49 correct tables, compared to 9.22 correct tables when AA is not implemented. Nevertheless, this difference is not significant ($p = 0.46$, Mann-Whitney test).

Disaggregating this analysis by group we first note that, in *Gender*, the result that there is no difference in performance depending on whether the policy has been implemented or not

holds for both women and men ($p = 0.58$ and $p = 0.68$, respectively, Mann-Whitney tests). Interestingly, the picture changes in treatment *Color*. In this treatment we observe that pink (i.e., advantaged) group members significantly increase their performance when AA has been implemented, while green (i.e., disadvantaged) group member significantly decrease their performance. Specifically, when affirmative action is implemented, advantaged group members produce 1.65 more tables on average ($p < 0.01$, Mann-Whitey test) and disadvantaged group members produce 1.38 fewer tables ($p = 0.03$), as seen in Table 3. Hence, the absence of a difference in performance by policy on aggregate masks the fact that advantaged and disadvantaged group members react to the policy strongly, but in opposing directions, so that the effects cancel out.

Table 3. Mean Performance in Stage 3 by Policy, Treatment and Group Status

	<i>Gender</i>		<i>Color</i>	
	AA	No AA	AA	No AA
Advantaged	8.49 (0.39)	9.22 (0.94)	8.98 (0.32)	7.33 (0.44)
Disadvantaged	8.48 (0.42)	9.22 (0.72)	8.43 (0.4)	9.81 (0.4)

Number of correct tables solved. Standard errors in parentheses.

Intuitively, we believe that these reactions can be rationalized by appealing to different behavioral effects affecting the members of each group. Pink group members may see the implementation of affirmative action as an unexpected benefit and increase performance, perhaps due to lower competitive pressure given the improvement in their chances of winning, or perhaps in an effort to show that they would have won the tournament even in the absence of an intervention. On the contrary, green group members are very likely to view the intervention as an unfair discrimination against them and decrease performance. Similarly, in the case when affirmative action has not been implemented, green group members may perform better because of feeling relieved that they have not been subject to discrimination, whereas pink group members may become disappointed and decrease their performance. All of these explanations are consistent with the pattern we see in our data. Of course, performance in Stage 3 is also likely to depend on each individual's vote and on whether the individual's preferred policy was chosen by the group: we return to this issue in the regression analysis below.

The average performance of the two tournament winners is reported in Table 4. Implementation of the affirmative action policy produces no significant efficiency loss in *Gender*.¹³ This echoes the results of Balafoutas and Sutter (2012) and Niederle et al. (2013) who find no significant impact of gender-related affirmative action on tournament efficiency, defined as the performance of the tournament’s winners. The difference is that we consider affirmative action endogenously implemented by the group members and are able to confirm that efficiency does not suffer in this case either. Moreover, in our framework – and in contrast to the two aforementioned studies – there is no self-selection into the tournament, and hence no efficiency gains to be made due to high-performing women who choose to enter the competition when affirmative action is in place. This means that efficiency losses are more likely in our study, and the fact that we do not find any lends further support to gender-based affirmative action programs. However, we do observe a marginally significant efficiency loss in treatment *Color-Cost*, where mean performance of the tournament winners drops from 11.75 to 10.73 when AA is implemented ($p = 0.07$, Mann-Whitney test).

Table 4. Mean Performance of Tournament Winners in Stage 3 by Treatment and Policy

	AA Implemented	AA Not Implemented
<i>Gender-No Cost</i>	11.42 (0.44)	13.25 (2.75)
<i>Gender-Cost</i>	11.68 (0.53)	12.00 (0.73)
<i>Color-No Cost</i>	11.21 (0.49)	11.00 (0.44)
<i>Color-Cost</i>	10.73 (0.29)	11.75 (0.41)

Number of correct tables solved. Standard errors shown in parentheses.

Regression results for individual performance in Stage 3 are reported in Table 5. We use a Poisson regression since the number of correct tables produced is a count variable. Standard errors are clustered at the group level to account for interdependencies which may result from

¹³ This result holds independently of whether one pools all groups or disaggregates by cost treatments.

different voting outcomes prior to the start of the five-minute period in Stage 3. The independent variables in the regressions are described as follows: *Correct T2* measures how many tables a subject correctly produced in the tournament in Stage 2, to account for a subject's competitive performance. *Belief T2* is the subjects' belief about relative performance in Stage 2, measuring confidence. *Advantage* is a dummy variable equal to one if the subject is an advantaged group member and zero otherwise. *AA* is a dummy variable equal to one if affirmative is implemented after the vote and zero otherwise, while *Advantaged*AA* is the interaction between being an advantaged group member and implementation of AA. *Cost* is a dummy equal to one for the cost treatments and zero otherwise. *Color* is a dummy for the *Color* treatment. *Vote Yes* is a dummy equal to one if the subject voted for the AA policy and 0 otherwise; this variable is important as it allows us to control for voting preferences in specifications (4) to (6). Finally, *Vote Yes*AA* is an interaction term which allows us to control for the interaction of voting preferences and implementation of the policy intervention. Models (1) and (4) contain the pooled data for all treatments. Models (2) and (5) estimate performance in the *Gender* treatment only, while Models (3) and (6) estimate performance in the *Color* treatment only.

Table 5. Poisson Regressions for Individual Performance in Stage 3

	Full Sample	Gender	Color	Full Sample	Gender	Color
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Correct T2</i>	0.091*** (0.006)	0.103*** (0.007)	0.072*** (0.01)	0.091*** (0.006)	0.103*** (0.007)	0.073*** (0.010)
<i>Belief T2</i>	0.029** (0.012)	0.051*** (0.016)	0.007 (0.017)	0.029** (0.013)	0.052*** (0.016)	0.007 (0.018)
<i>Advantaged</i>	-0.092** (0.042)	0.028 (0.053)	-0.17*** (0.052)	-0.102** (0.040)	0.014 (0.037)	-0.174*** (0.05)
<i>AA</i>	-0.044 (0.037)	0.042 (0.034)	-0.09* (0.053)	-0.049 (0.038)	0.036 (0.034)	-0.094* (0.055)
<i>Color</i>	0.01 (0.027)			0.013 (0.027)		
<i>Cost</i>	0.015 (0.026)	0.016 (0.041)	0.003 (0.036)	0.025 (0.029)	0.034 (0.044)	0.009 (0.042)
<i>Advantaged*AA</i>	0.089* (0.054)	-0.082 (0.069)	0.21*** (0.077)	0.078 (0.055)	-0.128** (0.059)	0.209*** (0.081)
<i>Vote Yes</i>				0.044 (0.078)	0.052 (0.171)	0.033 (0.065)
<i>Vote Yes*AA</i>				-0.005 (0.086)	0.030 (0.176)	-0.011 (0.081)
Constant	1.329*** (0.097)	1.102*** (0.103)	1.589*** (0.130)	1.322*** (0.097)	1.089*** (0.104)	1.583*** (0.133)
Prob > Chi2	0.000	0.000	0.000	0.000	0.000	0.000
Obs	354	174	180	354	174	180

Dependent variable: Number of tables correctly solved in the tournament of Stage 3. Standard errors clustered at the group level in parentheses. *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively.

We first note that, in treatment *Gender*, performance is affected by the usual control variables for performance in Stage 2 and confidence, but not by whether AA has been implemented or by whether an individual belongs to the advantaged group. There is one exception, namely the fact that women slightly reduce their performance when affirmative action is implemented according to specification (5) – noting, however, that this effect is insignificant based on the non-parametric tests reported earlier in this section, as well as in specification (2) or when (5) is estimated using a linear regression (see Appendix A). Additional regressions of *Belief T2* interacted with the subjects’ gender as well as *Advantaged* interacted

with the subjects' gender for the *Color* treatment are provided in Appendix B; the results are qualitatively the same as the ones described here.

Moreover, in line with what we have already discussed, there are strong performance differences by treatment and group identity in the *Color* treatment. Conditional on implementation of AA, advantaged group members increase their performance, while disadvantaged group members decrease their performance. The former effect is indicated by the positive joint coefficient $AA+Advantaged*AA$ ($p = 0.01$ and $p = 0.08$ in columns 3 and 6, respectively), while the latter is indicated by the negative coefficient of AA .¹⁴ Specifications (4) - (6) reveal that an individual's vote for or against the policy does not matter for his or her subsequent performance in Stage 3, regardless of treatment.

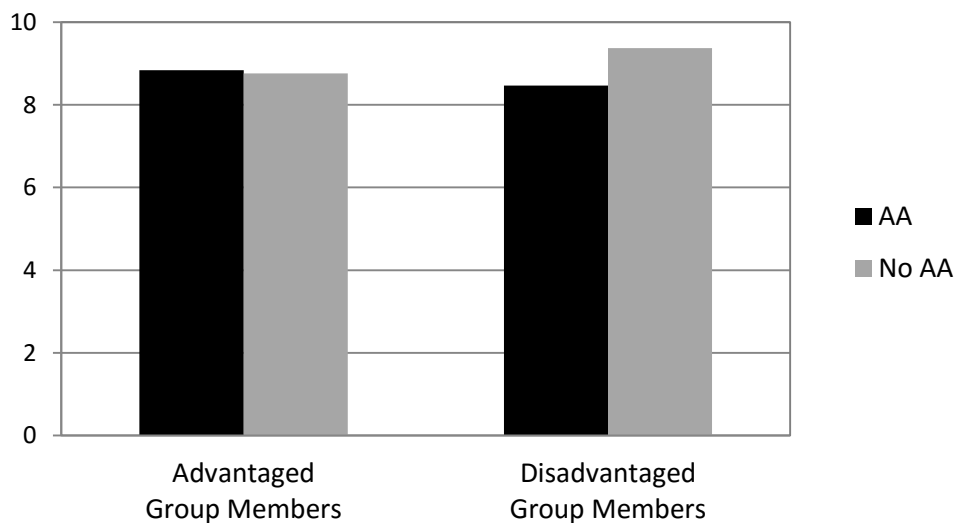
Finally, we note that neither risk attitudes (from the Eckel-Grossman task) nor the social preference index (from the Ring task) have any significant effect on performance, and therefore they are not included in Table 5.

3.4. Performance in the Team Production Task (Stage 4)

There are no differences between treatments in performance in the team production task of Stage 4. The mean performance pooled across *Color* and *Gender* in Stage 4 by group and policy implementation is shown in Figure 2. The results do not differ when the data are separated by *Color* or *Gender*, or broken down by voting cost. Hence, we conclude that the endogenous emergence of affirmative action policies – irrespective of whether the policy concerns gender or the randomly assigned color – does not affect performance in the team task, in line with what Sutter et al. (2015) have shown for exogenously implemented affirmative action policies in a sample of schoolchildren.

¹⁴ When the Table 5 specifications are estimated using linear regressions, the coefficient for AA in columns 3 and 6 (i.e., the performance decrease for disadvantaged members in response to affirmative action) remains negative but becomes insignificant, while the joint coefficient $AA+Advantaged*AA$ remains positive and significant. All other coefficients remain qualitatively the same; see Appendix A.

Figure 2. Table Production in the Team Task (Stage 4) by Group, Conditional on Policy Implementation



4. Conclusion

Affirmative action rules are often implemented to promote women on labor markets in general or within organizations – such as companies and political parties – in particular. Previous experimental work (see Balafoutas and Sutter, 2012; Niederle et al., 2013) has investigated whether the exogenous introduction of affirmative action programs affects the efficiency of performance in a tournament, finding no negative effects overall. Little is known, however, about how and whether such rules emerge endogenously in groups of potentially affected subjects. Here we have studied the approval of such rules in an experiment where group members can vote for or against the introduction of a quota rule, but can also abstain from the vote. A key feature of our experimental design is that the quota rule either favors women or a completely arbitrarily defined subgroup.

Our results suggest that when there can be some sort of (real-world or historical) justification for one group to receive preferential treatment via an affirmative action policy, the endogenous implementation of this policy has no effect on performance of efficiency. This is what we observe in treatment *Gender*. However, when a policy favors a group without an obvious or reasonable rationale for preferential treatment, as in the case in treatment *Color*, efficiency losses and significant changes in performance can occur following implementation of this discriminatory policy intervention. These findings may be useful to policy makers

considering various forms of affirmative action programs, either along gender or along other dimensions.

A number of limitations must be acknowledged in our study. For instance, it has been pointed out to us that it is unclear why women need to be favored in a task of counting zeros. While it is true that men and women perform equally well in this task, we note that gender quota policies are implemented very often in reality in fields in which women have no discernible disadvantage in terms of performance or qualifications. Thus, having such a policy is not unusual. Furthermore, some of the relevant literature to which we relate our findings has also used adding tasks in which there is no gender difference in baseline performance (Balafoutas and Sutter, 2012; Niederle et al., 2013). In any case, future work could examine the task-sensitivity of our findings, given that the nature of the task has been shown to affect the competitive behavior of men and women (Cardenas et al., 2012; Dreber et al., 2014). A further limitation is that our findings may be sensitive to the particular majority rule at the voting stage, given that the rule we implemented has a slight bias in favor of affirmative action and leads to high implementation rates. Finally, an interesting extension would be to include a treatment in which affirmative action positively discriminates men: this could serve as a benchmark against which to evaluate the acceptability and the effects of affirmative action that promote women.

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Appendix

A. Linear Regressions for Individual Performance in Stage 3

Table A1.

	Full Sample (7)	Gender (8)	Color (9)	Full Sample (10)	Gender (11)	Color (12)
<i>Correct T2</i>	0.781*** (0.053)	0.927*** (0.053)	0.591*** (0.078)	0.781*** (0.053)	0.923*** (0.054)	0.593*** (0.079)
<i>Belief T2</i>	0.270** (0.105)	0.475*** (0.128)	0.058 (0.147)	0.268** (0.106)	0.485*** (0.132)	0.058 (0.149)
<i>Advantaged</i>	-0.807** (0.360)	0.0463 (0.392)	-1.411*** (0.472)	-0.903** (0.367)	-0.0649 (0.437)	-1.469*** (0.458)
<i>AA</i>	-0.440 (0.350)	0.102 (0.438)	-0.800 (0.493)	-0.467 (0.355)	0.0694 (0.436)	-0.809 (0.521)
<i>Color</i>	-0.005 (0.246)			0.006 (0.245)		
<i>Cost</i>	0.037 (0.234)	-0.094 (0.391)	0.009 (0.320)	0.106 (0.252)	0.050 (0.399)	0.036 (0.375)
<i>Advan*AA</i>	0.766 (0.467)	-0.524 (0.551)	1.761** (0.694)	0.736 (0.491)	-0.817 (0.612)	1.799** (0.714)
<i>Vote Yes</i>				0.405 (0.664)	0.476 (1.534)	0.242 (0.568)
<i>Vote Yes*AA</i>				-0.178 (0.736)	0.0840 (1.633)	-0.185 (0.699)
<i>Constant</i>	1.931** (0.790)	-0.119 (0.808)	4.288*** (1.042)	1.891** (0.787)	-0.203 (0.821)	4.259*** (1.047)
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Obs	354	174	180	354	174	180

Linear regressions. Dependent variable: Number of tables correctly solved in the tournament of Stage 3. Standard errors clustered at the group level in parentheses. **, *** denotes significance at the 5%, 1% level, respectively.

B. Additional Regressions for Performance in Stage 3

Table B1 is identical to Table 5, with the exception that we now account for the interaction between belief and gender by means of the interaction term *BeliefT2*Male*. Including this interaction term does not alter the results on the effects of (non) implementation of AA.

Table B1.

	Full Sample (13)	Gender (14)	Color (15)	Full Sample (16)	Gender (17)	Color (18)
<i>Correct T2</i>	0.091*** (0.006)	0.103*** (0.007)	0.073*** (0.01)	0.091*** (0.006)	0.103*** (0.008)	0.732*** (0.010)
<i>Belief T2</i>	0.030** (0.013)	0.036 (0.025)	0.010 (0.018)	0.030** (0.013)	0.038 (0.025)	0.009 (0.018)
<i>Belief T2*Male</i>	-0.003 (0.011)	0.031 (0.028)	-0.014 (0.013)	-0.002 (0.011)	0.029 (0.028)	-0.015 (0.013)
<i>Advantaged</i>	-0.095** (0.045)	0.110 (0.096)	-0.17*** (0.054)	-0.105** (0.043)	0.089 (0.078)	-0.176** (0.051)
<i>AA</i>	-0.044 (0.037)	0.044 (0.035)	-0.093* (0.053)	-0.049 (0.038)	0.038 (0.036)	-0.097* (0.055)
<i>Color</i>	0.01 (0.027)			0.012 (0.027)		
<i>Cost</i>	0.016 (0.026)	0.016 (0.041)	0.005 (0.036)	0.025 (0.029)	0.034 (0.044)	0.011 (0.042)
<i>Advan*AA</i>	0.088 (0.054)	-0.079 (0.067)	0.211*** (0.078)	0.077 (0.055)	-0.122** (0.057)	0.210** (0.081)
<i>Vote Yes</i>				0.044 (0.078)	0.055 (0.157)	0.033 (0.066)
<i>Vote Yes*AA</i>				-0.006 (0.087)	0.022 (0.164)	-0.01 (0.082)
<i>Constant</i>	1.333*** (0.099)	1.06*** (0.082)	1.60*** (0.128)	1.325*** (0.099)	1.055*** (0.092)	1.6*** (0.131)
Prob < chi2	0.000	0.000	0.000	0.000	0.000	0.000
Obs	354	174	180	354	174	180

Poisson regressions. Dependent variable: Number of tables correctly solved in the tournament of Stage 3. Standard errors clustered at the group level in parentheses. *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively.

Table B2 is also identical to Table 5, with the exception that we now account for the interaction between *Advantaged* and gender by means of the interaction term *Advantaged*Male* for the *Color* treatment. Including this interaction term does not alter the results on the effects of (non) implementation of AA.

Table B2.

	Color (19)	Color (20)
<i>Correct T2</i>	0.073*** (0.01)	0.073*** (0.010)
<i>Belief TM</i>	0.005 (0.018)	0.005 (0.018)
<i>Advantaged</i>	-0.153*** (0.059)	-0.161*** (0.056)
<i>Advantaged*Male</i>	-0.027 (0.047)	-0.026 (0.047)
<i>AA</i>	-0.089* (0.053)	-0.093* (0.056)
<i>Cost</i>	0.003 (0.036)	0.008 (0.043)
<i>Advantaged*AA</i>	0.211*** (0.078)	0.21*** (0.081)
<i>Vote Yes</i>		0.031 (0.065)
<i>Vote Yes*AA</i>		-0.010 (0.081)
<i>Constant</i>	1.594*** (0.129)	1.588*** (0.132)
Prob < chi2	0.000	0.000
Obs	180	180

Poisson regressions. Dependent variable: Number of tables correctly solved in the tournament of Stage 3. Standard errors clustered at the group level in parentheses. *, *** denotes significance at the 10%, 1% level, respectively.

C. Experimental Instructions, translated from German – *not intended for publication*

[Sample Instructions for the Color-Cost treatment]

Welcome to an experiment on decision making. We thank you for your participation!

During the experiment, you and the other participants will be asked to make certain decisions. Your own decisions as well as the decisions of the other participants will determine your payment from the experiment, according to the rules that will be described in what follows.

The experiment will be conducted on the computer. You make your decisions on the screen. All decisions and answers will remain confidential and anonymous.

The experiment consists of 2 phases. The first phase will consist of 4 stages. The second phase will consist of 2 stages of decision tasks. In Phase 1 you will be paid for one randomly selected stage. Your total earnings from the experiment will be the sum of your payments for the randomly selected stage in Phase 1, your earnings from Phase 2, plus an endowment of €4.

You will receive instructions for each of the four stages in Phase 1, one after the other. Later you will receive instructions for Phase 2. We will read the instructions aloud and then give you time for questions. Please do not hesitate to ask questions if anything is not clear.

Please do not talk to each other during the experiment. If you have any questions, please raise your hand.

Phase 1

Stage 1: Piece rate

Your task in stage 1 is to solve correctly as many table exercises as possible. To be more precise, you will have 5 minutes' time count the number of 0's in a Table of 1's and 0's. The table consists of 10 rows and 10 columns for a total of one-hundred digits. The number of 1's and 0's is randomly generated. You may use your scratch paper if you wish. You enter an answer by clicking with the mouse on the "Confirm" button. When you enter an answer, you immediately find out on the screen whether it was correct or not.

If stage 1 is the stage selected for payment, then you will receive €0.50 (i.e., 50 cent) for each correct answer that you entered within the 5 minutes. Your payment is not reduced when you enter a wrong answer

Directly before the start of this stage you will be given one minute in order to familiarize yourselves with the screen: During this time you can solve table exercises, which do not count for the experiment. Afterwards, stage 1 will begin.

Stage 2: Tournament

As in stage 1, you will have 5 minutes' time in order to solve correctly as many tables as possible. However, your payment in this stage depends on your performance relative to the performance of a group of participants.

Allocation in groups: Each group consists of 6 participants, 3 of whom are green group members and 3 are pink group members. Groups are randomly formed at the beginning of this stage and group members are randomly determined to be green or pink group members. Each participant stays in the same group until the end of the experiment. You will not find out the identity of the other participants in your group during or after the experiment, so that all decisions remain anonymous.

If stage 2 is the stage selected for payment, then your payment depends on how many tables you have solved correctly in comparison with the other five participants in your group. The two group members who have entered the most correct answers are the two winners of the tournament. The two winners receive €1.50 per correct answer each, while the other four members do not receive any payment. In case of a tie, the ranking among the members with equal performances is determined randomly. From now on, we call this method of payment the Tournament payment.

You will not be informed about the outcome of the tournament until the end of the experiment.

Stage 3: Choice between two different tournament payments

As in stages 1 and 2, you will have 5 minutes' time in order to solve correctly as many tables as possible. However, before this stage begins, you will be given the chance to vote for the payment method that will be implemented in your group. You can either vote for the tournament with the same format as in the previous stage (Stage 2), or the Tournament-B payment. Each group votes on its own preferred scheme, so different groups may choose different schemes. Before we explain how the voting works, we describe below the Tournament-B payment scheme.

Tournament, format B

In the Tournament-B, the two winners are determined as follows. In each group, one of the two winners is in any case the pink group member with the best performance (of all three pink group members). The other winner is the group member with the best performance among the remaining members (i.e., excluding the best-performing pink member).

To sum up: A pink member wins a Tournament-B if he/she has the best performance among all pink members (top performing pink member) or if he/she is one of the two persons with the highest performance within his/her group of 6 (both green and pink members).

A green member wins a Tournament-B if he/she is the green group member with the best performance (the top performing green member) and at the same time one of the two persons with the highest performance within his/her group of 6 (both green and pink members).

So there is at least one pink group member and at most one green group member as winners in a Tournament-B.

As in Stage 2, the two winners receive €1.50 per correct answer each, while the other four members do not receive any payment. In case of a tie, the ranking among the members with equal performances is again determined randomly. The group composition (with 3 green group members and 3 pink group members) is as in stage 2. If you choose the Tournament-B payment, you will not be informed about the outcome of the tournament until the end of the experiment.

VOTING PROCEDURE FOR STAGE 3:

On the next screen you will be asked whether you want the tournament with the same format as in the previous stage (Stage 2) or whether you want the Tournament-B format for Stage 3. Everyone in your group will be asked which format they want: “*Do you want to implement the Tournament-B payment format for Stage 3?*” You can either vote “yes”, vote “no”, or you can abstain. A “yes” selection is a vote in favor of the Tournament-B format. A “no” selection is a vote for the format in Stage 2, the previous stage. Abstaining is neither a vote for the format in Stage 2 nor the Tournament-B format: therefore, those group members who choose to abstain have no influence on the outcome of the vote.

Note: If everyone abstains the format will be the Tournament form the previous stage, Stage 2.

Voting Cost: If you cast a vote of “yes” or “no” it will cost €1. If you “abstain” it does not cost anything. In other words you have to pay €1 if you decide to actively vote for your preferred tournament format. The voting cost will be subtracted from your earnings in Stage 3 no matter if you are a “winner” or not.

HOW IS THE TOURNAMENT PAYMENT FORMAT DETERMINED?

The tournament payment format for Stage 3 is determined by your voting selection of “yes”, “no”, or “abstain.” The Tournament-B payment format is selected if at least 50% of votes cast are “yes”, excluding the choices of those members who abstain.

Next we provide several examples.

1. In the group, 2 group members abstain, 2 members vote “yes” and 2 members vote “no”. In this scenario the Tournament-B format is implemented (2 out of 4 votes, 50%).
2. In the group, 2 members vote “yes”, 3 vote “no”, and 1 member abstains. In this scenario the Tournament-B format is not implemented (2 out of 5 votes, 40%) and the tournament has the same format as in stage 2.
3. In the group, 4 members abstain, 1 member votes “yes”, and 1 member votes “no”. In this scenario the Tournament-B payment format is implemented (1 out of 2 votes, 50%).

After you vote, everyone in the group will be informed of which tournament payment format is implemented for Stage 3. Afterwards you will have 5 minutes in order to calculate the number of 0’s in the table.

Stage 4: Team work

As in stages 1-3, you will have 5 minutes’ time in order to solve correctly as many tables as possible. The group composition (with 3 green group members and 3 pink group members) is

the same as before. However, your payment for this stage depends on your performance as well as on the total performance of all other members in your group.

To be more precise, your payment is determined as follows: You receive 8.33 euro cent for each correct answer that a member of your group has entered in the 5 minutes. This means that each correct answer is worth €0.50 for the entire group (i.e., all 6 members). It also means that all members of a group receive the same payment in this stage, and this depends only on the total performance of the group, i.e., on the sum of all correct answers of the 6 group members.

If stage 4 is the stage selected for payment, then your payment is the sum of your endowment, relative performance, your payoff from the performance of your group plus your earnings from Phase 2. At the end of the experiment you will be informed about the total performance of your group in this stage.

Phase 2: Decision Tasks

Stage 1

In Stage 1, all persons in the room will be randomly matched into pairs of two. Nobody will find out neither during nor after the experiment with whom he or she was connected. You will have to make 24 choices between two options, called Option A and Option B. Every option allocates a positive or negative number of tokens to your account and a positive or negative amount of tokens to the other person's account. This other person answers exactly the same questions. Your total income from Part 1 depends on your decision and the decision of the other person in your pair.

Example:

	Option A	Option B
Your Payoff	10.00	7.00
Other's Payoff	-5.00	4.00

If you choose option A, you will receive 10 tokens and the other person will be deducted 5 tokens. If the other person in your pair chooses option A too, then you will also receive a deduction of 5 tokens. In total you would have earned 5 tokens (10 tokens from your choice minus 5 tokens from the choice of the other person). In case you choose option B and the other person chooses option A, you will receive 2 tokens (7 tokens from your own choice minus 5 tokens from the choice of the other person in your pair). The other person would have earned 14 tokens (10 tokens + 4 tokens).

Your total income from Part 1 will be determined as follows: Looking at your decisions, the values for "Your payoff" will be summed up. Looking at the person you are connected with, the values for "Other's payoff" will be summed up. The sum of both sums determines your payoff and will be exchanged into euros according to the following exchange rate: 10 tokens = 1 euro. This exchange rate is only valid for Part 1.

You do not get any information on single decision of the person you are paired with, but you will be informed about the sum of payoffs. Please raise your hand if you have any questions. We will come to your seat to answer them.

Stage 2:

In this part of the study you will select from among five different gambles the one gamble you would like to play. The five different gambles are listed on the next screen. You must select one and only one of these gambles. To select a gamble click the appropriate button. Each gamble has two possible outcomes (Event A or Event B) with the indicated probabilities of occurring. Your compensation for this part of the study will be determined by: 1) which of the five gambles you select; and 2) which of the two possible events occur. }

Please note that if you should select either gamble 4 or gamble 5 and Event B occurs, your losses will be deducted from your total earning for completing Part 1 of the study.

For example: If you select gamble 4 and Event A occurs, you will be paid 6.80. If Event B occurs, you will have -0.40 which will be deducted from your earnings.

For every gamble, each event has a 50% chance of occurring.

After you have selected your gamble the computer will generate a random number between 0 and 1 to determine which event will occur. If the number is less than 0.5, Event A will occur. If the number is greater than 0.5, Event B will occur. If the number exactly equals 0.5 the computer will generate a new number.

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Loukas Balafoutas, Brent J. Davis, Matthias Sutter

Affirmative action or just discrimination? A study on the endogenous emergence of quotas

Abstract

Affirmative action rules are often implemented to promote women on labor markets. Little is known, however, about how and whether such rules emerge endogenously in groups of potentially affected subjects. We experimentally investigate whether subjects vote for affirmative action rules, against, or abstain. If approved by the vote, a quota rule is implemented that favors women in one treatment, but members of an artificially created group based on random color assignment in another treatment. We find that quota rules based on gender are implemented frequently and do not affect the performance of men and women in a contest. Quota rules based on an arbitrary criterion, however, are less often approved and lead to strong individual reactions of advantaged and disadvantaged group members and to efficiency losses. These results show that the effects of affirmative action policies largely depend on whether these policies are viewed favorably within the affected groups.

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