

Working Paper Series
(ISSN 2788-0443)

731

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Darya Korlyakova

CERGE-EI
Prague, July 2022

ISBN 978-80-7343-538-7 (Univerzita Karlova, Centrum pro ekonomický výzkum a doktorské studium)
ISBN 978-80-7344-643-7 (Národohospodářský ústav AV ČR, v. v. i.)

Do Pessimistic Expectations About Discrimination Make Minorities Withdraw Their Effort? Causal Evidence*

Darya Korlyakova [†]

June 27, 2022

Abstract

There is a long-standing concern that expected discrimination discourages minorities from exercising effort to succeed. Effort withdrawal could contribute to confirming negative stereotypes about minorities' productivity and enduring disparities. This paper extends the findings of correlational research by exogenously manipulating individuals' beliefs about discrimination against their group and exploring a causal link between perceived discrimination and individuals' labor market behavior. For this purpose, we conduct an online experiment in the US with a diverse sample of 2,000 African Americans. We randomly assign individuals to two groups and inform one group about the frequency of discrimination against African Americans in a previous survey. To study the information effects on effort, we subsequently measure participants' results on a math task. We document that most individuals initially overestimate discrimination against African Americans. The overestimation decreases strongly and significantly as a result of information provision. At the same time, treated individuals, males in particular, attempt and solve correctly *fewer* math problems compared to untreated individuals. Hence, our findings do not support the common concern that minorities' inflated expectations about discrimination induce them to underperform.

Key words: perceived discrimination, racial minorities, effort

JEL Classification: C99, D83, J15

*This study was supported by Charles University, GAUK project No. 132218, ERC-CZ/AV-B research project No. 300851901, the H2020-MSCA-RISE project GEMCLIME-2020 GA No. 681228 and by the Czech Science Foundation (20-11091S).

[†]CERGE-EI, a joint workplace of Charles University and the Economics Institute of the Czech Academy of Sciences, Politických vězňů 7, 111 21 Prague, Czech Republic. E-mail: darya.korlyakova@cerge-ei.cz. I am indebted to Michal Bauer and Julie Chytilová for valuable advice and continuous support. I thank Fulya Ersoy, Andreas Menzel, Mark Pingle, participants at IAREP/SABE Annual Conference 2021, ESA Global Conference 2021, LACBEE workshop 2021, 7th Annual PhD Workshop Experimental Development Economics - Lab in the Field, and 3rd EAYE Workshop for helpful comments. This study has been pre-registered in the AEA RCT Registry; AEARCTR-0006734. The experimental design was approved by the CERGE Ethical Committee.

1 Introduction

There is a long-standing concern that if a discriminated group reduces effort in response to expected discrimination, these expectations reinforce negative stereotypes about productivity of the group and perpetuate inequality. So far, this concern has been empirically tested by studying correlations between beliefs about discrimination against one's own group and job-related attitudes or behavior. The literature has found that individuals who perceive higher discrimination are less satisfied with their job, less committed to the organization, more likely to be absent at work, and more inclined to leave the firm (e.g. Ensher, Grant-Vallone, and Donaldson, 2001; Jones, Ni, and Wilson, 2009; Foley, Kidder, and Powell, 2002).

Despite the abundance of correlational research, causal evidence is lacking on how the prospect of facing discriminatory treatment by employers affects minorities' behavior. There are several ways in which individuals could respond to anticipated discrimination in terms of their effort. On the one hand, reducing minorities' pessimism about discrimination against them could motivate them to try harder and perform better, because now a fairer reward for their effort is expected. On the other hand, learning about lower discrimination may make minorities feel less in need of compensating their group disadvantage by impressing a majority employer with hard work. Hence, they may keep their effort unadjusted or even decrease it.

In this paper, we present evidence that minorities' pessimistic expectations about discrimination against their racial group do *not* hurt their performance. Our evidence is based on an online experiment conducted in the US with a representative sample of 2,000 African Americans. We randomly assign our participants to two groups and elicit their prior beliefs about discrimination against African Americans in a previous survey. In the treatment group, subjects are subsequently informed about the actual frequency of discrimination against African Americans. The information-provision stage is omitted for the control group. We chose an information intervention because, consistent with previous research that uncovers ubiquitous public misperceptions on a variety of topics¹, we hypothesize that minorities tend to hold inaccurate beliefs about the frequency of

¹See, for instance, Cruces, Perez-Truglia, and Tetaz (2013); Kraus et al. (2019); Bartoš, Bauer, Cahlíková, and Chytilová (2022) or Bursztyń and Yang (2021) for a recent review.

discriminatory treatment applied to them².

In the second part of the experiment, we measure treatment effects on subjects' beliefs about discrimination against their own racial group and collect a number of behavioral outcomes. Understanding whether minorities revise expectations in response to our information is important to explain changes in their subsequent behavior. Specifically, we are interested in subjects' effort on a mathematics assignment. Before proceeding with the assignment, participants are informed that the overall assignment earnings will be divided between them and a White person by another White respondent who will act as the third party. Individuals are aware that the third party may know both individuals' races and assignment performances. After the task is completed, we elicit participants' preference for a race-blind allocation of the math assignment earnings and measure subjects' willingness to exaggerate their assignment performances. A choice of the latter outcome was inspired by experimental research showing that individuals feel comfortable acting immorally or selfishly if they can justify their "questionable" behavior (e.g. Falk, Neuber, and Szech, 2020; Engel and Szech, 2020; Exley, 2020; Exley, 2016). In our study, an excuse for being dishonest would be a person's belief that he or she would eventually be treated unfairly, i.e. with a very high probability the third party would allocate money in favor of a White individual.

Our main results are the following. First, we find that the vast majority of our participants (96.2%) initially overestimate discrimination against African Americans. Misperceptions, which are typical for all demographic groups, are large, with most subjects believing that 50 or fewer of White individuals (out of 100) did not discriminate against African Americans in the previous survey. In contrast, we observe that 87 White respondents did not favor a White person in the money allocation task. This finding implies that choosing information treatment as a basis for our design hinged on a correct assumption that information gaps are widespread among minorities. Second, our intervention causes substantial reduction in misperceptions, resulting in 17.8 percentage point more optimistic posterior beliefs of those who were exposed to information about actual discrimination.

²This hypothesis is also somewhat aligned with supplementary findings by Haaland and Roth (2021), who have found that the majority of respondents overestimate the extent of racial discrimination in the US and that, relative to White respondents, African Americans hold similar or more extreme misperceptions regarding discrimination. However, the authors document the effects using a small sample of African Americans, and the focus of their paper is different: Haaland and Roth study a causal link between public beliefs about discrimination in local society and public support for pro-black policies.

Third, informed individuals attempt 1.75 percent *fewer* math problems; the information effects on task performance are also negative but do not reach significance. Pre-specified heterogeneity analysis by gender indicates that favorable news about discrimination only reduces the effort of males, i.e. they attempt and solve correctly significantly fewer math problems. Finally, anticipating less discrimination is not accompanied either by lower willingness to pay for the race-blind allocation of the assignment earnings or by less frequent exaggeration of one’s own assignment results.

This paper adds to growing experimental literature on information provision in the context of the online environment (e.g. Haaland and Roth, 2021; Haaland and Roth, 2020; Grigorieff, Roth, and Ubfal, 2020; Alesina, Miano, and Stantcheva, 2018; Lergetporer, Piopiunik, and Simon, 2017). A resemblance between these experiments and our work is that the former randomly expose some respondents to a credible message based on survey results, research evidence or statistics. Whereas previous research focuses on beliefs and behavior of majority members or representative samples, we study racial minorities’ responses to information about a controversial issue using a large diverse sample of African Americans.

Existing literature often identifies the adverse consequences of discrimination or stereotyping on individuals’ performance and their education- or career-related choices (e.g. Lavy and Sand, 2018; Carlana, 2019). Other studies document that working or studying under the guidance of negatively biased individuals depresses minorities’ effort on tasks that biased individuals supervise (e.g. Glover, Pallais, and Pariente, 2017). Unlike these two strands of literature, we study minorities’ effort responses to anticipated discrimination by an unfamiliar majority member. This may correspond to a real-life situation in which individuals start a new job and have not yet had personal experience with a majority employer. Shedding light on minorities’ effort shortly after hiring is important because it may contribute to the employer’s first impression.

Our paper also contributes to the literature that explores how historically discriminated groups alter their behavior in response to potential discrimination, e.g. women decide not to reveal their true gender on a male-stereotypical task (Charness, Cobo-Reyes, Meraglia, and Sánchez, 2020) and are even willing to pay to exclude gender from their resume-like profiles (Alston, 2019). Female economists improve the clarity of their writing to meet

higher standards that are likely to be imposed on them (Hengel, 2020). In an attempt to avoid discriminatory treatment, immigrants undertake multiple assimilation steps (Fouka, 2019), racial minorities resort to "resume whitening" to conceal their race (Kang, DeCelles, Tilcsik, and Jun, 2016) and ethnic minorities engage in misrepresenting of their ethnicity (Kudashvili and Lergetporer, 2019). The key difference of our study is that earlier work does not pin down the role of beliefs about discrimination as a channel that may underlie minorities' behavioral adjustments to a potentially unfavorable environment³.

Collecting direct causal evidence on beliefs allows us to rule out a number of alternative explanations. For instance, individuals might not change or might even decrease effort in response to optimistic news about their discrimination because we provide information on a controversial issue that could trigger strong emotions and cause major disagreement. Hence, individuals might stick to their initial misperceptions or move their beliefs even further from the truth. Such a backfire effect is not supported by our data: 80.7% of treated subjects shift their beliefs in an expected direction⁴. Furthermore, thanks to eliciting beliefs, we can exclude a possibility that asymmetric behavioral responses of males and females to our information are driven by differential belief updating.

In a related paper, Gagnon, Bosmans, and Riedl (2020) study the effects of unequal chances and their sources (e.g. gender discrimination) on labor supply. The authors inform a man and a woman paired together about a payment scheme before they perform a real-effort task. In one of the treatments, the authors aim to fix beliefs about discrimination by mentioning to workers that their chances depend on their gender. However, it remains unclear whether subjects misperceive, i.e. overestimate, discrimination against women ex-ante. It is possible that information affects labor supply through emotions in addition to subjects' beliefs or instead of beliefs. In Study 2, the authors ask all subjects at the end of the experiment to what extent, in their opinion, gender discrimination is used to determine their wage. This non-incentivized measure provides correlational evidence on the role of beliefs. Our paper goes one step further by exploring the causal impact of beliefs about discrimination against one's own group on minorities' effort.

³In a post-experimental survey, Alston (2019) asked participants to guess which worker - a man or a woman - the managers will choose. The author also elicited beliefs about gender discrimination in the real world and at Amazon MTurk in particular. These beliefs are, however, endogenous because they are subject to influences of unobservable factors that could also correlate with subjects' willingness to pay to reveal or conceal their own gender.

⁴8.2% of the treatment group state the same prior and posterior belief.

The rest of the paper is organized as follows. Section 2 discusses the experimental design and our sample. Section 3 presents the experimental results, and Section 4 concludes.

2 Experimental design and sample

2.1 Sample

We recruited 2,000 African American respondents⁵ with the help of Prodege, which is a US market research agency. Our sample is broadly representative of the African American population residing in the US in terms of key observable characteristics. Table B.1 illustrates that our sample matches the respective population with respect to gender, age, and region. Due to difficulties experienced in recruiting low-educated respondents, we slightly deviate from the sample representativeness along the education dimension. To address minor imbalances, we re-weight the data and discuss the results of this exercise in the robustness subsection. The sample size and its composition, as well as main hypotheses and empirical analysis were pre-specified: <https://www.socialscisceregistry.org/trials/6734>. Table B.2 presents summary statistics for our sample. Table B.3 demonstrates that randomization was successful, i.e. the treatment group and control group are well balanced in terms of observables.

2.2 Experimental design

In the beginning, we asked demographic questions and elicited respondents' prior beliefs about discrimination against their own racial group. Next, we randomly assigned one half of our respondents to the information treatment. Subsequently, all subjects performed a real-effort assignment and were asked to state their posterior beliefs about discrimination. Then, we measured subjects' willingness to pay for race-blind allocation of their assignment earnings. We also asked participants to check their assignment results and to report their performance. In the very end, subjects answered additional background questions⁶. Figure A.1 summarizes the main stages of our experiment.

⁵Initially we obtained 2,003 responses, but we exclude 3 respondents from Puerto Rico from our analyses to construct regions in line with US Census Bureau classification. The results from regressions without controls remain the same if all 2,003 observations are used.

⁶We decided not to collect all demographics before treatment to minimize fatigue effects and to avoid priming subjects with sensitive questions.

2.2.1 Prior beliefs about discrimination against one’s own racial group

To gain insight into the existence of original misperceptions, we first collected individuals’ prior beliefs about the prevalence of discrimination against their racial group. For these purposes, we truthfully informed participants that we had conducted a survey with 100 White respondents who were asked to allocate a monetary amount (2 USD) between a White person and an African American person. Thereafter, we asked subjects to estimate (i) how many out of 100 White respondents gave more to a White person and (ii) how many of these individuals gave at least the same amount to an African American person as they gave to a White person⁷. The latter guess was incentivized in the following way. We told experimental participants that we would randomly choose 100 of them and pay these individuals 5 USD in addition to their participation fee if their estimate was equal to the actual number of White respondents who gave the same amount or more to an African American person relative to a White person.

We acknowledge that our measure of discrimination is mostly representative of contexts in which White individuals cannot disguise their preferential treatment of a White person. More ambiguous and complex settings, which enable people to excuse or misrepresent their socially inappropriate behavior, are likely to give rise to covert racism and increase the share of people who tend to discriminate against African Americans but are reluctant to express this preference openly. Nevertheless, the goal of this paper is not to identify the overall level of racial discrimination in the US society. We are interested in investigating whether minorities expect widespread unfair treatment against them even when contextual features of the decision environment do not allow the majority group to justify their discriminatory actions.

2.2.2 Treatment: survey evidence of discrimination against African Americans

Next, we informed a random half of our respondents (the treatment group) about the true prevalence of discrimination against their racial group in the previous survey. In

⁷We included both questions to prevent participants from thinking that researchers find one of the scenarios - that White respondents favored a White person or that they did not discriminate *against* an African American person - more probable or more interesting. To minimize the risk of careless answers, we used a response validation that did not allow subjects to move to the next page if the numbers they had recorded did not sum up to 100.

particular, participants learned that, according to the survey results, 87 out of 100 White respondents had implemented an equal split or allocated more to an African American person. Subjects also saw a bar chart comparing the actual number to their own estimate.

The information-provision stage was omitted for the control group that directly proceeded to the real-effort assignment.

2.2.3 Outcome I: Performance on the real-effort assignment

To investigate whether information about discrimination against one’s own racial group affects people’s productivity, we offered all subjects to answer 20 math multiple-choice questions (problems) during a 5-minute interval. For this purpose, we borrowed some math problems from a recent paper by Bohren, Haggag, Imas, and Pope (2019). We preferred the math assignment over a motor, mindless task or a clerical task because we expected that participants would find it engaging and cognitively demanding⁸ and thus would care about their performance on the assignment. We measured both (i) the number of problems that our subjects solved correctly and (ii) the number of problems that they attempted. Participants were allowed to skip questions in this part of the experiment. We explicitly asked subjects not to use a calculator or online help but to do their best. To prevent looking up the answers, we limited the maximum time that a person could spend on each page with math problems to 60 seconds.

Before allowing participants to proceed with the math assignment, we explained to them how they would be paid for their work. Specifically, we told subjects that they would first be matched with a random White respondent (the other person) who would complete the same assignment. Later, a randomly selected third party, a White respondent⁹, would allocate the assignment earnings in the total amount of 2 USD between them and the other person. We explicitly mentioned that the third party may be informed about each person’s race and their productivities on the assignment¹⁰.

⁸While providing feedback to our survey, some respondents explicitly mentioned their engagement with the math assignment.

⁹We did not explicitly state that the third parties were selected from a different pool of respondents than 100 White individuals from the previous survey. If some of our treated subjects thought that information describes third parties’ behavior, they would consider our message to be more relevant for their situation (which does not go against our intentions).

¹⁰We used "may" in the instructions to avoid deception. Fiorin (2021) used a similar framing so that subjects would perceive their whistleblowing as consequential. Eventually the author did not forward any subjects’ reports about their colleagues to the Ministry of Education to prevent harming employees

To ensure that subjects carefully read the instructions and understood the payment scheme, we asked them to complete a short comprehension check, which consisted of three control questions, before starting the assignment. Participants had to decide whether it is true or false that (i) they would be randomly matched with a White person; (ii) the third party, another White respondent, would allocate assignment earnings between them and the other person; and (iii) the third party may see information about races and productivities before making the allocation decision. See Appendix C for precise formulations of the statements. Subjects were also provided with an opportunity to return to the instructions (before submitting their answers) by pressing the back button.

2.2.4 Outcome II: Posterior beliefs about discrimination against own racial group

After the assignment was completed, we collected individuals' posterior beliefs about the prevalence of discrimination against their racial group. This measure allows us to study whether the information treatment induces exogenous shifts in subjects' perceptions regarding discrimination, which may underlie subsequent changes in subjects' behavior. The posterior beliefs were elicited by asking participants to predict the behavior of the third parties who would allocate the assignment earnings between a White person and an **equally productive** African American person from their survey. The belief elicitation procedure was incentivized in a similar manner as before. Subjects were informed that they would receive an additional 5 USD (i) if they were among 100 randomly chosen individuals and (ii) if their guess about the percentage of the third parties who would decide on an equal split or would give more to an African American person equaled to the actual percentage of such third parties¹¹.

We chose not to ask an identical question while eliciting prior and posterior beliefs for as a result of his study. In our experiment, the third party would not necessarily see the subject's and other person's race because, at a later stage, subjects had a chance to conceal race-related information (see section 2.2.5). Furthermore, in 50% of cases, the third party would not see true productivities. We introduced this uncertainty to incentivize careful reporting of productivities by subjects which constituted a basis for one of our outcomes of interest. See section 2.2.6 for further details.

¹¹We find that in 90 percent of cases third parties do not discriminate against African Americans. This number is very close to the number of White respondents (87 out of 100) who behaved in a non-discriminatory way in the previous survey. Taking into account that (i) we collected original data from White respondents in cooperation with a different survey agency (Kantar) and (ii) the initial survey did not mention equal productivity of money recipients, the frequency of (explicit) discrimination against African Americans that we observe seems to be stable in the online environment.

several reasons. First, our goal was to measure genuine updating instead of “anchoring” to the number that we showed to treated participants¹². Second, we aimed to detect whether information about previous discrimination induced changes in expectations about future discrimination because the latter are a channel that may underlie minorities’ labor market decisions, such as the supply of effort.

2.2.5 Outcome III: Willingness to pay for race-blind allocation of assignment earnings

Minorities may respond to learning about the true extent of discrimination against their group not only by adjusting their effort, but also in terms of willingness to disclose sensitive information about themselves. In this regard, we elicited the subjects’ marginal rate of substitution between (i) money for themselves and (ii) hiding race-related information from the assignment evaluator, i.e. the White third party. We used a multiple price list that consisted of six decision tasks presented in rows. In each row, individuals made a choice between concealing their and the other person’s race from the third party and extra money for themselves. As participants moved down the list, the monetary amount was increasing in 20-cent increments from 0 USD to 1 USD. We incentivized subjects to choose in accordance with their true preferences by telling them that one of their six decisions would be randomly chosen for actual payoff.

2.2.6 Outcome IV: Self-reported performance on the math assignment

Finally, minorities may find it less psychologically costly to engage in dishonest behavior, by exaggerating the number of problems they solved correctly¹³, if they are more likely to expect that they will be treated unfairly by the third party. To probe this hypothesis, we reminded subjects of their choices by showing them their answer to each math question¹⁴. Next to the list of the subject’s answers, we presented the answer key. To evaluate their performance, participants had to count the number of rows in which their choices and correct answers coincided. We encouraged participants to take the self-evaluation task seriously by truthfully informing them that with a 50 percent chance the third party would

¹²This concern would be less relevant if we additionally collected beliefs in an obfuscated follow-up survey (see, for instance, Haaland and Roth [2021]).

¹³Other experimental studies also resort to reported performance to give subjects an opportunity to cheat (e.g. Schwieren and Weichselbaumer, 2010; Mazar, Amir, and Ariely, 2008).

¹⁴If a participant did not make any choice, he/she saw blank space next to the corresponding question.

see their and the other person’s productivity according to their self-reports. In this case, no information about *true* productivities would be revealed to the White respondent responsible for allocation.

3 Results

This section presents our main results. First, we document inflated prior beliefs about discrimination against African Americans among the vast majority of our respondents. Second, we discuss the substantial reductions in subjects’ misperceptions as a result of the information treatment. Third, we argue that overestimating discrimination does not have a detrimental effect on minorities’ assignment performance. If anything, informing minorities about less discrimination *reduces* their subsequent effort. Fourth, we note that the information treatment does not move the remaining outcomes. We end the section by subjecting our results to a number of robustness checks.

3.1 Prior beliefs about discrimination against one’s own racial group

To establish the rationale for our information treatment, we first explore whether our experimental participants have misperceived discrimination against African Americans. Figure 1 shows kernel densities of beliefs about the number of White respondents from the previous survey who allocated the same amount or more to an African American person relative to a White person. The densities have two peaks at about 25 and 50. The number highlighted in the figure (87) represents the actual number of White respondents and serves as the benchmark for categorizing subjects into underestimators and overestimators. We find that most of our participants (96.2%) initially overestimate discrimination against African Americans. A mean (median) subject believes that only 36.4 (35) White respondents allocated at least the same amount to an African American person as to a White person.

[Figure 1 here]

Upward biased perceptions prevail across all demographic groups and they are large

in magnitude. Figure A.2 illustrates unconditional mean beliefs across demographics¹⁵. While younger individuals on average believe that 39 White individuals (out of 100) did not discriminate against African Americans, older individuals are somewhat more pessimistic about discrimination (mean belief = 33.7). Democrats on average believe that 34.9 White individuals allocated at least the same amount to an African American person as to a White person. Compared to them, Independents and Republicans are closer to the truth (mean belief = 39.5). Females expect from White individuals more discriminatory treatment relative to males (mean belief equal to 34.8 and 38.3, respectively). Subjects with at least some college experience on average believe that 35.3 White individuals showed equal or preferential treatment toward African Americans. The magnitude of misperceptions among lower educated individuals is somewhat lower (mean belief = 38.3).

Below we summarize our first result.

Result 1: *Minorities vastly overestimate discrimination against their racial group. Original upward biased misperceptions of discrimination span across demographics.*

3.2 Treatment effects on beliefs about discrimination

Next, we examine the information treatment effects on subjects' beliefs about the percentage of White third parties who will allocate the same amount or more to an African American person from the current survey relative to an equally productive White person. Exploring changes in perceived discrimination is important because (i) they signal participants' attentiveness (or lack thereof) to our information and agreement with it, and (ii) they may explain patterns in subjects' post-treatment behavior that we also measure.

[Figure 2 here]

Both our graphical evidence and regression results indicate that information provision causes significant and economically meaningful shifts in subjects' beliefs about discrimination against African Americans. Column 1 of Panel A in Table 1 shows that the treatment on average raises beliefs about the percentage of White third parties who will

¹⁵Differences across groups (e.g. higher and lower educated individuals; Democrats and Republicans/Independents) remain directionally similar and are significant if one regresses prior beliefs on different demographics simultaneously.

not discriminate against African Americans from the current survey by 17.8 percentage points (control mean = 47.13%, $p < 0.01$). Figure 2 demonstrates that the treatment moves the density of posterior beliefs about *no* discrimination against one's own racial group to the right of the control-group density¹⁶.

[Table 1 here]

Our pre-specified heterogeneity analyses show that significant updating of beliefs about discrimination is a general phenomenon, rather than being driven by certain subgroups of our participants (see Column 1 in Table 2 and in Tables B.4-B.5). For example, treated females and males hold posterior beliefs by 17 and 18.8 percentage points, respectively, closer to the truth compared to their untreated counterparts¹⁷. Nevertheless, individuals with at least some college experience tend to update their beliefs significantly more strongly compared to lower-educated counterparts.

We do not perform pre-specified heterogeneity based on prior beliefs, by splitting the sample into overestimators and underestimators, due to the lack of variation in this variable (as mentioned in Subsection 3.1). However, we explore whether individuals who are ex-ante more uninformed about discrimination against their racial group (i.e. hold more inaccurate prior beliefs) are more likely to revise their beliefs. Table B.6 shows that this is in fact the case. Treated subjects with below-median priors, i.e. beliefs that are more distant from the true number, state a posterior belief of no discrimination against African Americans that is about 21 percentage points higher relative to a posterior belief of untreated subjects (whose prior lies in the same range). Having a prior above or equal to the median contributes to a difference of 14.4 percentage points between the treatment and control group, which is statistically different from the previous number ($p < 0.01$).

Based on the findings in this subsection, our second result is:

Result 2: *Information about discrimination against own racial group strongly affects minorities' beliefs.*

¹⁶The Appendix presents evidence that original perceptions of discrimination do not differ across two groups. Table B.3 shows that the means of prior beliefs are virtually the same ($p = 0.97$) and Figure 1 illustrates a strong resemblance between the control and treatment densities of prior beliefs.

¹⁷The regressions without controls lead to similar results.

3.3 Treatment effects on real-effort task performance

In this subsection, we investigate the causal effects of perceived discrimination on subjects' effort and performance on a math assignment. Given that beliefs about discrimination against one's own group are relevant for minorities' labor market behavior, two scenarios are possible. In the first case, informing individuals about less prevalent discrimination may increase a subjective probability of succeeding in the math assignment and thus will serve as a motivation for higher effort. This prediction agrees with the findings of correlational studies. We use data from the control group respondents to investigate correlations between beliefs about the percentage of third parties who would send at least the same amount to an African American person as to an equally productive White person and effort. Column 2 in Table B.7 shows a positive but insignificant correlation between subjects' beliefs and math problems solved correctly. A one standard deviation increase in beliefs about *no* discrimination against African Americans is associated with a 0.05 of a standard deviation higher performance on the math assignment ($p=0.12$). This association is reduced to 0.04 of a standard deviation when controls are included ($p=0.16$).

In the alternative scenario, higher optimism regarding expected discrimination may make minorities consider their race a less negative signal and hence will reduce their effort. As the third party is expected to be less biased as a result of information provision, minorities should be less concerned about counteracting a negative stereotype applied to their racial group.

Our causal evidence contrasts the results of correlational research: minorities do *not* tend to respond to lower perceived discrimination with higher effort. Column 2 of Panel A in Table 1 shows that treated individuals attempt on average 0.31 fewer math problems, which represents a 1.75 percent decrease compared to the control group mean equal to 17.75 problems ($p<0.05$). The information-treatment effects on the number of math problems solved correctly (Column 3 of Panel A in Table 1) are also negative but do not reach statistical significance (control mean = 12.15 problems, $p = 0.20$)¹⁸.

Pre-specified heterogeneity analysis by gender reveals that the negative information effects

¹⁸To demonstrate that there was room for improving results on the math assignment among treated subjects compared to the control group, we present a histogram of actual performance in the Appendix (Figure A.3). Only 2.6 percent of our subjects solved all 20 math problems correctly.

on effort are driven by males. Column 2 in Table 2 shows that treatment decreases the number of problems attempted by males by 0.43 ($p < 0.05$). This decrease constitutes a 2.4 percent change relative to the control group mean equal to 18.1 problems. Moreover, an average treated male solves 0.63 fewer math problems correctly, which represents a 4.8 percent decrease compared to an average male performance of 13 in the control group (Column 3 in Table 2, $p < 0.05$). Both information effects are insignificant for females. Interestingly, the information treatment completely eliminates the conditional gender gap¹⁹ in effort and performance on the math assignment which exists in the control group²⁰.

[Table 2 here]

The finding that males, but not females, exhibit significant behavioral responses to information about discrimination against their own racial group cannot be explained by patterns in posterior beliefs described earlier. Recall that both genders in our experiment state similar beliefs after receiving information about discrimination against African Americans in the previous survey (Column 2 in Table 2). In a similar vein, Koutout (2020) finds that *only* males' job application decisions are responsive to beliefs regarding hiring managers' beliefs about the relative productivity of females and males.

Differential effects of perceived discrimination on effort across genders could be reconciled with the conclusions of research on competitiveness. Subjects are likely to consider the environment we create as competitive because we emphasize (i) that there is a common pool of assignment earnings that will be divided between a subject and a White person and (ii) that the productivities of both individuals may be revealed to the allocator²¹. Being informed about relatively uncommon preferential treatment of Whites may make subjects perceive the other person's race as less advantageous and thus they will view the environment as less competitive compared to the control group²². Previous work (Niederle and Vesterlund, 2011; Gneezy, Niederle, and Rustichini, 2003; Günther, Ekinci, Schwierien, and Strobel, 2010; Price, 2008; Morin, 2015) frequently shows that, in re-

¹⁹This gap is defined as differences between males and females after we adjust for a set of pre-specified covariates (e.g. education).

²⁰An untreated man attempts on average 0.51 more problems and solves correctly 1.1 more problems relative to an untreated woman ($p < 0.01$).

²¹See, for instance, a scheme in Appendix C that conveys these two messages. To summarize the key features of the payment process, we showed the scheme to all participants shortly before the assignment.

²²Future work should explicitly verify this conjecture.

sponse to *more* aggressive competition, males perform better while females' performance is generally unaffected, at least in the case of male-stereotypical tasks.

Summarizing the findings in this subsection, we state our third result as follows:

Result 3: *Pessimistic expectations regarding discrimination against one's own racial group do not make minorities underperform.*

3.4 Treatment effects on other outcomes

Our subsequent discussion focuses on information effects on (i) willingness-to-pay for race-blind allocation of assignment earnings and (ii) misreporting of one's own performance on the math assignment. Expecting less discrimination may make minorities less motivated to sacrifice extra money in order to hide their and the other person's race from the third party. In addition, if minorities start believing less strongly that the third party will act unfairly in relation to them, it may become harder for them to justify dishonest behavior and hence they will be less prone to exaggerate their performance²³.

Column 4 in Table 1 shows information effects on willingness-to-pay for race-blind allocation. In line with the pre-analysis plan, we construct the former variable by counting the number of rows (out of 6) in which subjects choose to withdraw information about their and the other person's race from the third party over extra money for themselves²⁴. The mean number of rows in the control group is 2.9, with standard deviation equal to 1.99. Only 16.9% of untreated individuals never choose to conceal race-related information. Next, we standardize willingness-to-pay using the mean and standard deviation of the control group. We do not find that positive news about discrimination makes minorities less willing to pay for concealing information about races from the third parties ($p=0.95$).

Finally, we explore differences in performances reported by subjects at the end of the experiment. As described earlier, the mean actual performances in the control and treatment groups are 12.15 and 11.91 problems, respectively. For a comparison, an average untreated (treated) subject *reported* having solved correctly 12.68 (12.35) problems. Col-

²³Columns 3 and 4 in Table B.7 display insignificant associations between untreated subjects' beliefs about discrimination and their willingness to conceal race information from the third party and to exaggerate their performance.

²⁴Haaland and Roth (2021) used a similar approach while measuring willingness to donate to a pro-black civil rights organization.

umn 5 in Table 1 presents the results of a regression in which the dependent variable is the extent to which participants misreport their math results, calculated as the difference between a subject’s reported and real number of correctly solved math problems. We find muted information effects on subjects’ propensity to overstate their assignment results ($p=0.59$)²⁵. However, we acknowledge that ceiling effects may have contributed to the null results: 63.6% of untreated subjects report their performance correctly and those who misreport exaggerate their performance on average only by 1.44 math problems.

Thus, our fourth result is stated as follows:

Result 4: *Minorities’ willingness-to-pay for race-blind allocation of their assignment earnings and decision to exaggerate their math assignment performance do not generally respond to favorable information about discrimination against their racial group.*

3.5 Robustness

To test the validity of our findings, we present the results of several robustness checks in this subsection. First, Panel B in Table 1 shows that the information-treatment effects stay virtually the same if a pre-specified set of covariates is included in the regressions²⁶. Second, Panel A in Table B.8 demonstrates that excluding subjects who did not pass the comprehension check²⁷ affects the significance of our estimates but the magnitudes are close to the magnitudes of the original treatment effects. It is worth noting that we informed all subjects about the correct answers to the control questions immediately after they completed the comprehension check. Third, excluding respondents in the top 2% and bottom 10% of the time spent on the entire survey (Panel B in Table B.8) confirms

²⁵While splitting the sample by political views, we find that non-Democrats, who make up 34% of our subjects, respond to the information treatment in terms of their behavior somewhat more strongly compared to Democrats. Table B.5 shows that, relative to untreated non-Democrats, treated non-Democrats exaggerate their performance less ($p<0.10$) and attempt and solve correctly fewer math problems ($p<0.05$ and $p=0.16$, respectively). Treatment effects on the same outcomes are always far from being significant for Democrats. The identified differences along political lines seem to be intuitive and suggest that Democrats are reluctant to adjust their behavior in situations that may involve discrimination against them, even if they start perceiving this discrimination as less likely than before.

²⁶Due to a coding error, I omitted the category "part-time employee" when asking participants about their current employment status. Hence, it is possible that some individuals who work part-time may have chosen "full-time employee" or the "prefer not to answer" category. Our causal results are robust to including different sets of the employment-status dummies.

²⁷We consider that a subject did not pass the comprehension check if he or she answered *at least* one of three control questions incorrectly. Such definition implies that 57 percent of our participants passed the comprehension check. The passing rate does not differ across the treatment and control group ($p=0.94$).

the robustness of our findings²⁸. Finally, as Panel C in Table B.8 shows, re-weighting observations (to reflect a slight under-representation of African Americans with very low education in our sample) does not significantly affect the treatment effects²⁹.

4 Conclusion

In this paper, we test the effects of an information intervention on minorities' beliefs regarding discrimination against their own racial group and labor market behavior. Two features - (i) exogenous manipulation of minorities' beliefs and (ii) subsequent measurement of minorities' causal behavioral responses to perceived discrimination - distinguish our study from previous research. We document that minorities largely misperceive discrimination and that their beliefs about racial inequality are systematically upward biased. Providing information about actual discrimination in the previous survey effectively reduces minorities' pessimism and somewhat *decreases* their effort on the assignment. Therefore, our findings do not support the common concern that minorities' inflated expectations about discrimination induce them to underperform.

Choosing an online experiment as a research method grants us a number of advantages. It creates a controlled environment in which we could causally identify the role of an important mechanism - minorities' beliefs - in prompting preventive responses to potential discrimination. At the same time, our participants are less likely to feel under observation compared to a laboratory experiment and thus their decisions are more similar to those they would make in a natural setting. In the light of the COVID-2019 pandemic, which initiated a massive transition to remote work, online experiments have started to resemble real settings even more closely. Therefore, our findings on effort have increased potential to be externally valid in the new reality of the workplace.

Our initial causal evidence informs policymakers that campaigns aimed at correcting minorities' beliefs about discrimination against them, which undoubtedly have benefits such as raising awareness, could ultimately decrease minorities' effort. This information could encourage policymakers to more rigorously test a promising policy to prevent a scenario

²⁸Our lower and upper boundaries follow the choice of Alesina, Miano and Stantcheva (2018).

²⁹When computing the weights, we used a raking procedure (DeBell and Krosnick, 2009). Although age, gender, and geography strongly resemble the respective population shares, we target them in addition to education in order to make the sample fully balanced along these dimensions.

in which unintended consequences of the policy are revealed only after it is implemented. Examples of such policies are not difficult to find. Leibbrandt and List (2018) find that equal employment opportunity statements, commonly used by companies around the world, discourage racial minorities from applying for jobs. The authors' complementary analysis suggests that unexpected effects are driven by minorities' reluctance to be hired due to regulation rather than thanks to their own merits.

Our results provide a first step towards understanding the causal effects of perceived discrimination, thereby offering several fruitful avenues for the future research. First, it remains an open question whether the effects of information about discrimination will persist. In this study, we collect beliefs and behavioral measures immediately after exogenously providing the survey results on past discrimination. Furthermore, it is important to credibly measure whether minorities whose pessimistic expectations were re-calibrated experience less stress while performing a real-effort task. Using experimental tools for the purpose of this exploration will complement the findings of previous research (e.g. Sims et al., 2012; Pascoe and Smart Richman, 2009; Pavalko, Mossakowski, and Hamilton, 2003; Mays and Cochran, 2001), which has repeatedly documented a negative significant relationship, mostly associations, between perceived discrimination and mental and physical health. Finally, more work is needed to understand how minorities will respond to information about discrimination against their racial group in different domains, e.g. labor and housing markets, politics, education, which will be disclosed gradually. Similarly, the effects of repeated information provision are unknown and warrant further investigation.

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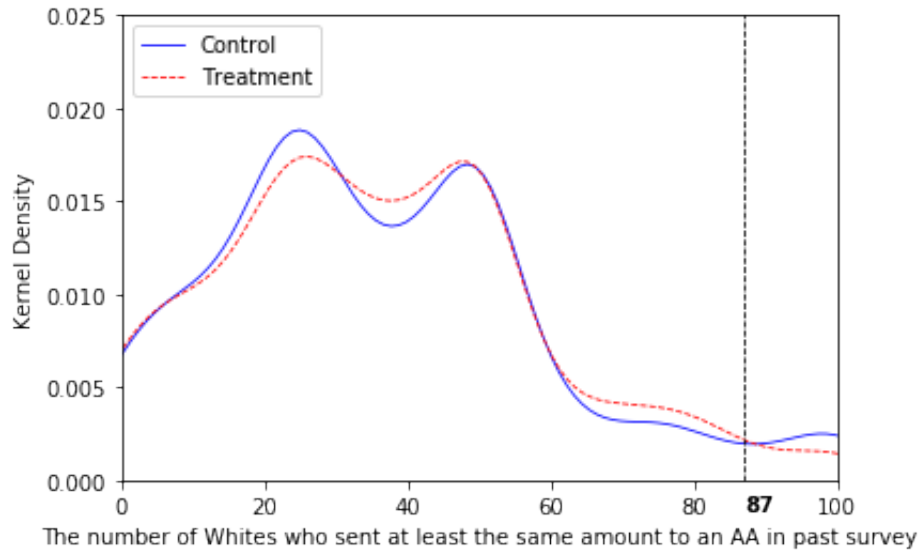
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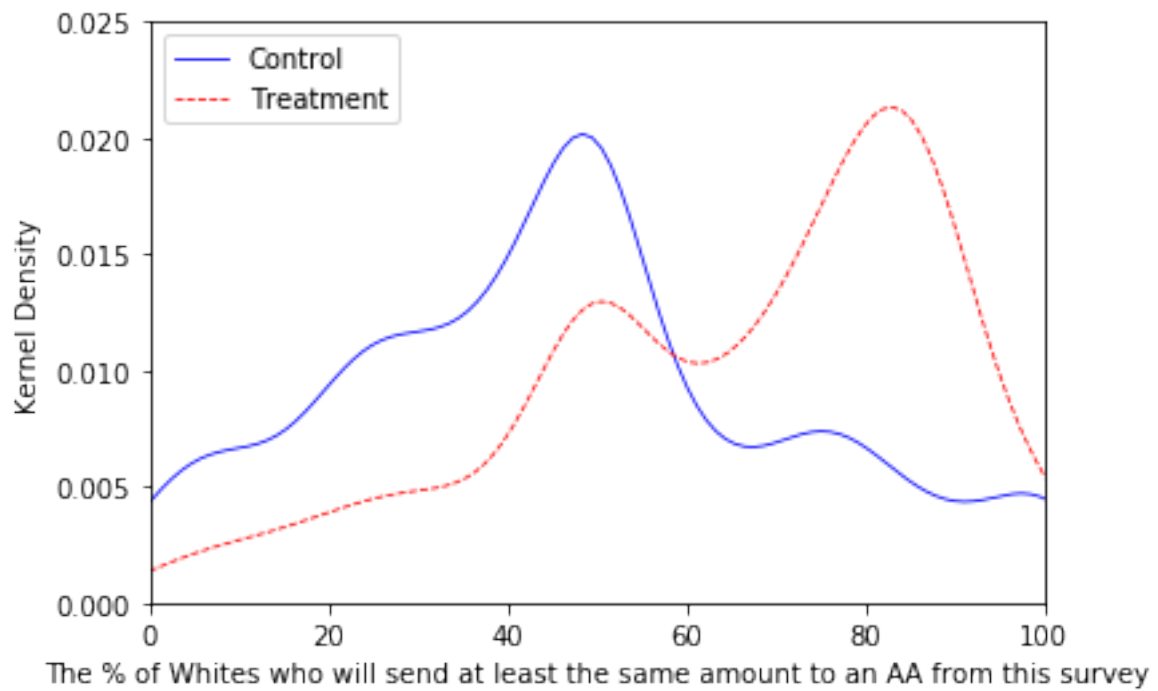
Main figures

Figure 1: Prior beliefs about discrimination against one's own racial group



Notes: The figure uses prior beliefs of 2,000 experimental participants about the number of White respondents (out of 100) who allocated the same or larger amount to an African American person relative to a White person. The black short-dashed line denotes the actual number of such White respondents, based on the previous survey results.

Figure 2: Posterior beliefs about discrimination against one's own racial group



Main tables

Table 1: Pre-specified outcomes (main regression specifications)

	Posterior belief	Attempted problems	Correct problems	WTP for race-blind allocation	Extent of performance exaggeration
	(1)	(2)	(3)	(4)	(5)
Panel A: Without covariates					
Treatment	17.85*** (1.10)	-0.31** (0.14)	-0.24 (0.19)	0.003 (0.05)	-0.08 (0.15)
Panel B: With covariates					
Treatment	17.86*** (1.07)	-0.30** (0.13)	-0.19 (0.17)	-0.008 (0.05)	-0.13 (0.15)
Observations	2,000	2,000	2,000	2,000	2,000
Control mean	47.13	17.75	12.15		0.53

Notes: *Posterior belief* is equal to a subject's estimate of the percentage of White third parties who would *not* discriminate against an African American person in the current survey. *WTP for race-blind allocation* equals to the number of times the subjects prefer to withdraw information about their and the other person's race from the third party over money for themselves. This variable has been standardized using the mean and standard deviation in the control group. *Extent of performance exaggeration* has been calculated as the difference between a subject's reported and real number of correctly solved math problems. In Panel B regressions, the following pre-specified covariates are included: gender, age, household size, regional, educational and income dummies, prior belief, employment status, and political orientation. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Heterogeneity analysis by gender (pre-specified)

	Posterior belief	Attempted problems	Correct problems	WTP for race-blind allocation	Extent of performance exaggeration
	(1)	(2)	(3)	(4)	(5)
Treatment (a)	17.09*** (1.45)	-0.19 (0.18)	0.18 (0.22)	0.007 (0.06)	-0.20 (0.20)
Treatment \times Male (b)	1.69 (2.13)	-0.25 (0.26)	-0.82** (0.35)	-0.03 (0.09)	0.16 (0.31)
Male	-1.79 (1.57)	0.51*** (0.18)	1.06*** (0.25)	0.04 (0.06)	0.01 (0.23)
Linear combination: a + b	18.78*** (1.56)	-0.43** (0.18)	-0.63** (0.26)	-0.03 (0.06)	-0.04 (0.24)
Observations	2,000	2,000	2,000	2,000	2,000
Covariates	yes	yes	yes	yes	yes
Control mean	47.33	17.46	11.45		0.55

Notes: In all regressions, the following pre-specified covariates are included: age, household size, regional, educational and income dummies, prior belief, employment status, and political orientation. Robust standard errors in parentheses. *Male* is a dummy variable that takes value 1 if a person is a male and 0 if a person is a female. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

A Appendix figures

Figure A.1: Main elements of the experimental design

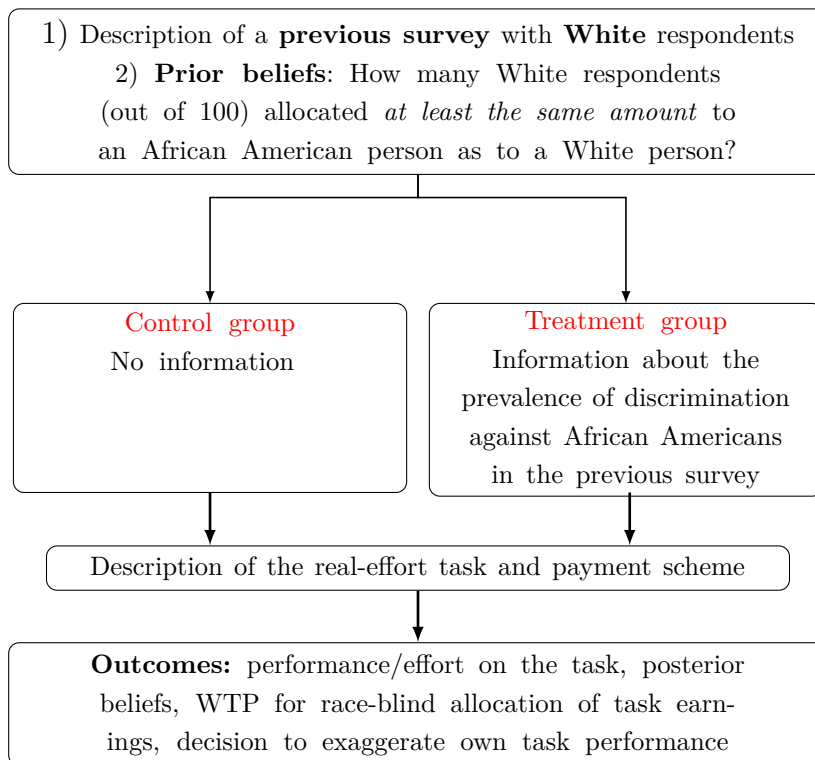
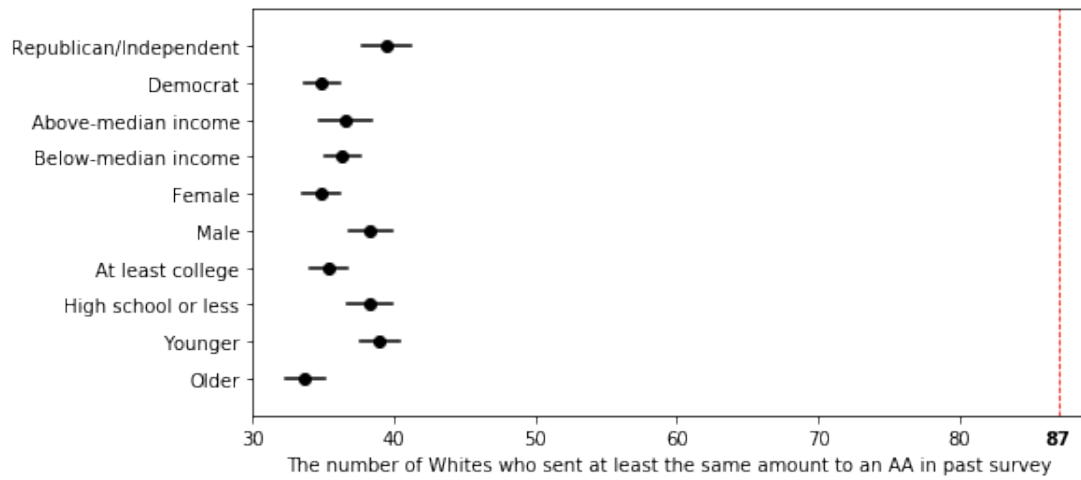
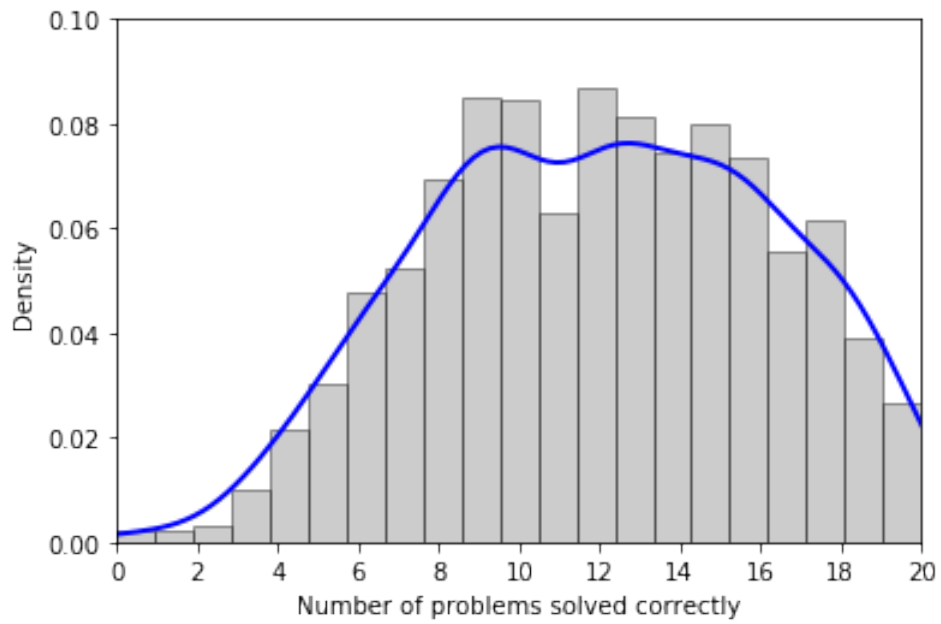


Figure A.2: Prior beliefs about discrimination against one's own racial group (across demographics)



Notes: The horizontal axis depicts a prior belief about the number of White individuals (out of 100) who allocated (in the previous survey) at least the same amount or more to an African American person relative to a White person. The red short-dashed line denotes the actual number of such White respondents, based on the previous survey results. The dots illustrate the mean prior beliefs for different demographic groups, and the lines show the 95% confidence intervals. Older (younger) individuals represent those whose age is higher than (below or equal to) the median age of 42.

Figure A.3: Distribution of actual performance on the math task



Notes: The figure uses data from 2,000 experimental participants and shows a distribution of the number of math problems solved correctly (out of 20). The blue curve is kernel density estimation.

B Appendix tables

Table B.1: Demographic composition of our sample compared to the African American population residing in the US

	Mean: experiment	Mean: U.S. Census Bureau
Gender		
Male	0.45	0.46
Female	0.55	0.54
Age group		
18 to 34 years	0.361	0.345
35 to 49 years	0.264	0.255
50 to 64 years	0.234	0.241
65 years and over	0.141	0.159
Education		
Less than high-school graduate	0.053	0.128
High-school graduate	0.318	0.332
Some college, no degree	0.28	0.205
Associate's degree	0.101	0.097
Bachelor's degree	0.163	0.155
Graduate or professional degree	0.085	0.083
Region (by US Census Bureau)		
Northeast	0.156	0.173
Midwest	0.168	0.164
South	0.585	0.567
West	0.091	0.096

Notes: This table compares the shares of selected socio-demographic groups in our experiment to the corresponding shares received from the US Census Bureau. In the case of the first three categories, data from 2019 Current Population Survey are used while regional shares are based on 2019 estimates of the African American population in the United states.

Table B.2: Summary statistics

	Mean	SD	Median	Min.	Max.	Obs.
Male	0.45	0.50	0.00	0.00	1.00	2,000
Age	43.23	16.59	42.00	18.00	88.00	2,000
Low education	0.37	0.48	0.00	0.00	1.00	2,000
Middle education	0.38	0.49	0.00	0.00	1.00	2,000
High education	0.25	0.43	0.00	0.00	1.00	2,000
Northeast	0.16	0.36	0.00	0.00	1.00	2,000
Midwest	0.17	0.37	0.00	0.00	1.00	2,000
South	0.59	0.49	1.00	0.00	1.00	2,000
West	0.09	0.29	0.00	0.00	1.00	2,000
Household income (categories)	3.39	2.07	3.00	1.00	9.00	2,000
Employed	0.47	0.50	0.00	0.00	1.00	2,000
Student	0.08	0.26	0.00	0.00	1.00	2,000
Unemployed	0.16	0.37	0.00	0.00	1.00	2,000
Retired	0.18	0.38	0.00	0.00	1.00	2,000
Democrat	0.66	0.47	1.00	0.00	1.00	2,000
Republican	0.06	0.23	0.00	0.00	1.00	2,000
Household size	2.79	1.69	2.00	1.00	21.00	2,000
Prior belief about discrimination against African Americans	36.42	22.90	35.00	0.00	100.00	2,000
Passed the comprehension check	0.57	0.50	1.00	0.00	1.00	2,000

Notes: This table presents the summary statistics. Low (middle) education implies **at most** secondary-school (Associate's degree) completion.

Table B.3: Randomization check

	Treatment	Control	t-stat (p-value)	Obs.
Male	0.45	0.45	0.91	2,000
Age	43.82	42.63	0.11	2,000
Low education	0.37	0.37	0.77	2,000
Middle education	0.38	0.39	0.62	2,000
High education	0.25	0.25	0.82	2,000
Northeast	0.16	0.16	0.97	2,000
Midwest	0.17	0.17	0.87	2,000
South	0.58	0.59	0.76	2,000
West	0.10	0.09	0.43	2,000
Household income (categories)	3.40	3.38	0.88	2,000
Employed	0.48	0.45	0.14	2,000
Student	0.07	0.08	0.32	2,000
Unemployed	0.15	0.17	0.17	2,000
Retired	0.17	0.18	0.57	2,000
Democrat	0.67	0.66	0.73	2,000
Republican	0.06	0.06	0.97	2,000
Household size	2.75	2.83	0.28	2,000
Prior belief about discrimination	36.44	36.46	0.97	2,000
Passed comprehension check	0.57	0.57	0.94	2,000

Notes: Means. Column 6 reports p-values for a t-test testing the null hypothesis that the means are equal across two treatment arms. The p-value of an F-test for the joint significance of all covariates in predicting the treatment status is 0.7513.

Table B.4: Heterogeneity analysis by education (pre-specified)

	Posterior belief	Attempted problems	Correct problems	WTP for race-blind allocation	Extent of performance exaggeration
	(1)	(2)	(3)	(4)	(5)
Treatment (a)	14.67*** (1.86)	-0.48** (0.22)	-0.03 (0.29)	-0.08 (0.07)	-0.005 (0.27)
Treatment \times College (b)	5.07** (2.26)	0.29 (0.28)	-0.25 (0.36)	0.12 (0.09)	-0.19 (0.33)
College	-1.42 (1.69)	-0.37* (0.19)	2.29*** (0.27)	-0.11* (0.07)	-0.31 (0.24)
Linear combination: a + b	19.73*** (1.29)	-0.19 (0.16)	-0.28 (0.21)	0.04 (0.06)	-0.20 (0.18)
Observations	2,000	2,000	2,000	2,000	2,000
Covariates	yes	yes	yes	yes	yes
Control mean	48.47	18.02	10.72		0.63

Notes: In all regressions, the following pre-specified covariates are included: gender, age, household size, regional, income dummies, prior belief, employment status, and political orientation. Robust standard errors in parentheses. *College* is a dummy variable that takes value 1 if a person a person has at least some college experience and 0 if an individual has high-school education or less. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B.5: Heterogeneity analysis by political affiliation (pre-specified)

	Posterior belief	Attempted problems	Correct problems	WTP for race-blind allocation	Extent of performance exaggeration
	(1)	(2)	(3)	(4)	(5)
Treatment (a)	17.55*** (1.81)	-0.54** (0.21)	-0.43 (0.31)	0.08 (0.08)	-0.46* (0.26)
Treatment \times Democrat (b)	0.45 (2.23)	0.37 (0.27)	0.37 (0.37)	-0.13 (0.09)	0.49 (0.33)
Democrat	-0.62 (1.64)	-0.01 (0.18)	-0.20 (0.27)	0.06 (0.07)	-0.29 (0.24)
Linear combination: a + b	18.01*** (1.32)	-0.17 (0.16)	-0.06 (0.21)	-0.05 (0.05)	0.04 (0.19)
Observations	2,000	2,000	2,000	2,000	2,000
Covariates	yes	yes	yes	yes	yes
Control mean	48.49	17.95	12.47		0.68

Notes: In all regressions, the following pre-specified covariates are included: gender, age, household size, regional, educational and income dummies, prior belief, employment status. Robust standard errors in parentheses. *Democrat* is a dummy variable that takes value 1 if a person reports to be a Democrat and 0 if an individual identifies himself/herself with Republicans or Independents. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B.6: Heterogeneity analysis by prior belief

	Posterior belief	Attempted problems	Correct problems	WTP for race-blind allocation	Extent of performance exaggeration
	(1)	(2)	(3)	(4)	(5)
Treatment (a)	14.44*** (1.41)	-0.42** (0.18)	-0.11 (0.24)	0.08 (0.06)	-0.23 (0.23)
Treatment \times Distant prior (b)	6.53*** (2.16)	0.25 (0.26)	-0.13 (0.34)	-0.17* (0.09)	0.19 (0.31)
Distant prior	-12.56*** (1.58)	-0.19 (0.18)	0.52** (0.25)	0.10 (0.06)	-0.44** (0.22)
Linear combination: a + b	20.96*** (1.64)	-0.17 (0.19)	-0.24 (0.24)	-0.09 (0.07)	-0.04 (0.20)
Observations	2,000	2,000	2,000	2,000	2,000
Covariates	yes	yes	yes	yes	yes
Control mean	53.48	17.9	11.9	0	0.73

Notes: In all regressions, the following pre-specified covariates are included: gender, age, household size, regional, educational and income dummies, employment status, and political orientation. Robust standard errors in parentheses. *Distant prior* is a dummy variable that takes value 1 if a person initially stated that fewer than 35 White individuals (median belief) allocated the same amount or more to an African American person relative to a White person. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B.7: Associations between beliefs and outcomes

	Attempted problems	Correct problems	WTP for race-blind allocation	Extent of performance exaggeration
	(1)	(2)	(3)	(4)
Panel A: Without covariates				
Belief about no discrimination against African Americans	0.001 (0.004)	0.009 (0.006)	0.001 (0.001)	0.005 (0.005)
Panel B: With covariates				
Belief about no discrimination against African Americans	-0.000 (0.004)	0.007 (0.005)	0.001 (0.001)	0.005 (0.005)
Observations	995	995	995	995

Notes: *Belief about no discrimination against African Americans* is equal to a subject's estimate of the percentage of White third parties who would allocate the same amount or more to an African American person relative to an equally productive White person in the current survey. In Panel B regressions, the following pre-specified covariates are included: gender, age, household size, regional, educational and income dummies, employment status, and political orientation. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B.8: Robustness checks (main regression specifications)

	Posterior belief	Attempted problems	Correct problems	WTP for race-blind allocation	Extent of performance exaggeration
	(1)	(2)	(3)	(4)	(5)
Panel A: Excluding subjects who did not pass comprehension check					
Treatment	20.14*** (1.39)	-0.26 (0.17)	-0.26 (0.22)	-0.06 (0.06)	-0.09 (0.18)
Observations	1134	1134	1134	1134	1134
Covariates	yes	yes	yes	yes	yes
Control mean	47.5	17.61	12.61		0.45
Panel B: Excluding subjects with too short & long survey completion					
Treatment	18.56*** (1.12)	-0.25* (0.13)	-0.25 (0.17)	-0.005 (0.05)	-0.07 (0.15)
Observations	1759	1759	1759	1759	1759
Covariates	yes	yes	yes	yes	yes
Control mean	46.76	17.56	12.4		0.46
Panel C: Re-weighting observations					
Treatment	16.65*** (1.21)	-0.38** (0.16)	-0.19 (0.18)	-0.04 (0.04)	-0.17 (0.18)
Observations	2,000	2,000	2,000	2,000	2,000
Covariates	yes	yes	yes	yes	yes
Control mean	47.71	17.53	11.78		0.61

Notes: In *Panel A*, we limit our analysis to respondents who answered all three comprehension questions correctly. In *Panel B*, we exclude respondents in the top 2% and bottom 10% of the time spent on the survey. The chosen cutoffs are the same as Alesina, Miano & Stantcheva (2018) used in their robustness checks. In *Panel C*, we present the results of OLS regressions that we run on the re-weighted data. Re-weighting is employed mostly to correct for undersampling of respondents with very low education. In all cases, the following pre-specified covariates are included: gender, age, household size, regional, educational and income dummies, prior belief, employment status, and political orientation. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

C Experimental Instructions

C.1 Introduction and agreement with participation

The results from this study will be used in a research project. It is therefore important that you precisely follow the instructions. You will remain anonymous throughout the survey. Your participation is completely voluntary and you can withdraw at any time without penalty.

All data obtained from you will be kept in a form that does not permit your identification.

IMPORTANT NOTE: This study employs a strict non-deception policy. This means that all information you receive is truthful. You MAY be eligible for extra incentives. The total amount of these incentives will be calculated at the beginning of December and added to your fixed participation fee.

I have read and understood the above and agree to participate in this study:

- Yes
- No

C.2 Demographic questions

1. What is your age? [respondent writes a number]
2. Please indicate your gender. [Male; Female]
3. Which of the following best describes your race or ethnicity? [African American/Black; Asian/Asian American; Caucasian/White; Native American, Inuit or Aleut; Native Hawaiian/Pacific Islander; Other]
4. Which category best describes your highest level of education? [Eighth Grade or less; Some High School; High School degree / GED; Some College, no degree; Associate's degree, occupational; Associate's degree, academic; Bachelor's Degree; Master's Degree; Professional Degree (JD, MD, MBA); Doctoral Degree]
5. In which state do you currently reside? [List of 50 US states, DC, Puerto Rico]

C.3 Prior belief elicitation

Recently we have conducted a survey with 100 White respondents who were asked to allocate real 2 USD between a White person and an African American person.

What do you think? How many out of 100 White respondents...

- gave more to a White person than to an African American person
- gave **at least** the same amount to an African American person as they gave to a White person?

The numbers that you record should sum up to 100.

Please try to estimate the number of White respondents as close as possible. We will select by chance 100 respondents from this survey and reward the accuracy of their estimates with an additional incentive.

If you are selected and you guess correctly the true number of White respondents who gave at least the same amount to an African American person as they gave to a White person, you will receive 5 USD in addition to your participation fee.

You will be allowed to proceed to the next screen after 45 seconds.

C.4 Information screen (This page was skipped for the Control group)

You stated that **[subject's guess]** of White respondents allocated at least the same amount to an African American person as they allocated to a White person.

According to the survey results, **87** out of 100 White respondents implemented the equal split or allocated more to an African American person.

The graph below compares your estimate, i.e. the number of respondents who gave at least the same amount to an African American person as to a White person, to the corresponding actual number of White respondents (out of 100 people) from the previous survey.

[A subject additionally sees a bar chart.]

You will be allowed to proceed to the next screen after 30 seconds.

C.5 Assignment instructions

In this part of the survey, you have a chance to receive extra money, at most 2 USD, for answering multiple-choice math questions. We are interested in determining how many of 20 math questions you can get right without any help. So please do not use a calculator or look up the answers online, but rather just do your best.

In most cases, your answers will be submitted automatically after 60 seconds and you will auto-advance to the set of new math questions. This assignment will last for about 5 minutes.

We will now explain how you will be paid for this work.

1. You will be matched with a random White respondent (the other person) who will complete the same assignment.
2. We will ask a randomly selected third party, a White respondent, to allocate 2 USD, the reward for performing the assignment, between you and the other person.

The third party will not be able to identify you or the other person. However, he or she may be informed about (i) your and the other person's race and (ii) your and the other person's productivity on the assignment.

If you receive extra money for the assignment, it will be paid to you as an additional incentive for completing this survey.

C.6 Comprehension check

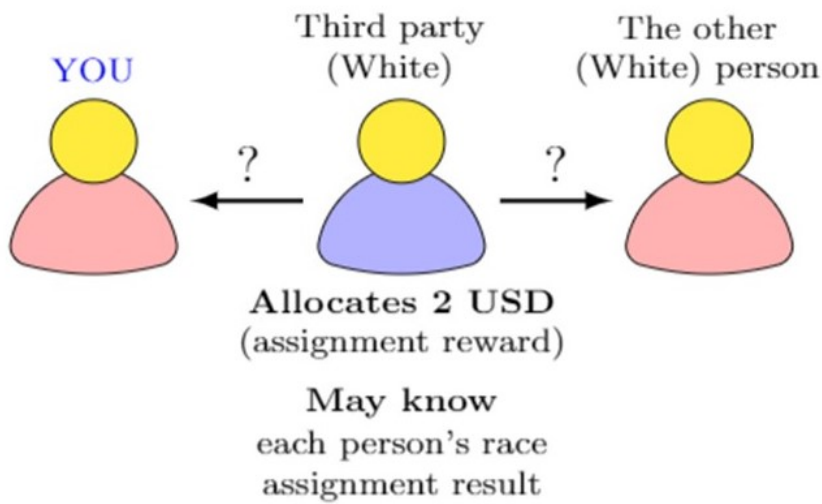
In this part, we would like to check your understanding of the assignment instructions that you read before. If you prefer to go through the instructions one more time, press the back button.

For each of the below statements, please decide whether it is true or false.

	True	False
I will be randomly matched with a White respondent who will perform the same assignment.		
A third party (a White respondent) will allocate extra 2 USD between me and the other person.		
Before allocating the money, the third party may see information about my and the other person's race and productivity on the assignment.		

You will be allowed to proceed to the next screen after 20 seconds.

All statements that you saw are TRUE.



Please press \rightarrow to start the assignment.

C.7 Assignment

$$5 + 6 + 7 + 8 + 9 + 10 = ?$$

- 45
- 51
- 42
- 48

$$(18 + 19 + 20)/3 = ?$$

- 19
- 18
- 20
- 21

$$56/8 = ?$$

- 7
- 6
- 5
- 8

$$76/4 = ?$$

- 18
- 17
- 19
- 20

$$(4 + 5)/5 = ?$$

- 6.25
- 1
- 1.8
- 5

$$x = 5, y = 6, z = 7, \text{ then what is } xy/(z - 4)?$$

- 8
- 10

- 6

- 4

Twenty cannot be divided by which of the following?

- 5

- 2

- 3

- 4

Which of the following fractions cannot be further reduced?

- $7/35$

- $46/2$

- $3/5$

- $3/6$

$45 + 3 - 1 = ?$

- 48

- 46

- 49

- 47

$10/5 + 34 - 4 = ?$

- 36

- 34

- 30

- 32

$16 < x + 8 < 26$. Which of the following could x be?

- 23
- 18
- 13
- 8

$$2 * (-3 - 8) = ?$$

- -14
- 14
- 22
- -22

Which of the following can be divided by five (without a remainder)?

- 44
- 46
- 45
- 43

$$4 + 8 + 12 + 16 = ?$$

- 40
- 20
- 25
- 45

$$24/4/3 = ?$$

- 4
- 1
- 2

- 3

$$(4 * 2 + 7 * 8) / 4 = ?$$

- 20
- 24
- 12
- 16

$$35/7 + 1 = ?$$

- 4
- 7
- 6
- 5

$$2 * 3 * 4 * 5 = ?$$

- 120
- 720
- 24
- 240

$$5 * (7 + 3) + 5 - 4 = ?$$

- 55
- 39
- 51
- 32

Which of the following is the closest integer to $45/7$?

- 6

- 5
- 7
- 8

C.8 Collecting posterior beliefs

Now we would like you to predict the behavior of the third parties who will allocate the assignment earnings (2 USD) between an African American person and an [equally productive](#) White person from this survey. The third parties are White respondents.

What do you think? What percentage of the third parties will give [at least](#) the same amount to an African American person as they will give to a White person?

We will select by chance 100 respondents from this survey and reward the accuracy of their predictions with an additional incentive.

If you are selected, we will compare your prediction to the actual percentage of third parties who will allocate at least the same amount to an African American person as to an [equally productive](#) White person.

If your prediction is the same as the corresponding true percentage of third parties, you will receive 5 USD in addition to your participation fee.

C.9 Measuring willingness-to-pay for race-blind allocation

Now we want to assess how much you would value race-blind allocation.

For each of the 6 choices below, please decide whether the third party will see no information about your race and the other person's race or whether you should get money in addition to your participation fee.

We will randomly implement your decision for one of these choices, which involve real money, so please consider each choice carefully. Each decision has the same chance of being implemented.

Your decision

The third party will not learn about our races	I will receive 0 cents
The third party will not learn about our races	I will receive 20 cents
The third party will not learn about our races	I will receive 40 cents
The third party will not learn about our races	I will receive 60 cents
The third party will not learn about our races	I will receive 80 cents
The third party will not learn about our races	I will receive 1 USD

Please note that this extra money is independent of your assignment earnings.

C.10 Reporting one's own performance

There is a 50 percent chance that the third party you are matched with, a White respondent from a different survey, will see how productive you were on the assignment in comparison to the White person according to your own reports. Specifically, each of you will be asked to write down the number of problems that you solved correctly.

If this option is implemented, the third party will see the reported result but NOT actual performance before deciding how to allocate money between you and the other person. He or she will be made aware whether or not information about performance is based on self-reports.

Please carefully compare your choices to the test answers and write down the number of arithmetic problems that you solved correctly.

	Correct answer	Your choice
Q1	1	...
Q2	1	...
Q3	1	...
Q4	3	...
Q5	3	...
Q6	2	...
Q7	3	...
Q8	3	...
Q9	4	...
Q10	4	...
Q11	3	...
Q12	4	...
Q13	3	...
Q14	1	...
Q15	3	...
Q16	4	...
Q17	3	...
Q18	1	...
Q19	3	...
Q20	1	...

I have solved the following number of problems correctly: ...

C.11 Background questions

Including yourself, how many people are currently living in your household?

In politics, as of today, do you consider yourself a Republican, a Democrat or an Independent? [Republican; Democrat; Independent]

What is your current employment status? [Full-time employee; Self-employed or small business owner; Unemployed and looking for work; Student; Not currently working and

not looking for work; Retiree; Prefer not to answer]

If unemployed and looking for work: How long have you been unemployed and seeking for work? [0-3 months; 4-6 months; 6-12 months; 1-2 years; more than 3 years; Prefer not to answer]

What was your TOTAL household income, before taxes, last year? [Less than \$15,000; \$15,000 to \$24,999; \$25,000 to \$49,999; \$50,000 to \$74,999; \$75,000 to \$99,999; \$100,000 to \$149,999; \$150,000 to \$200,000; More than \$200,000; Prefer not to answer]

C.12 Participants' feedback

Finally, if you have any comments or questions related to this survey, please write them down in the blank space below. Your feedback is very important to improve our research.

Abstrakt

Otázka, zda očekávaná diskriminace odrazuje menšiny od vynakládání vyššího úsilí k dosažení úspěchu, je dlouhou dobu diskutována. Nedostatek vynaloženého úsilí může přispívat k přetrvávajícím rozdílům a potvrzování negativních stereotypů o produktivitě menšin. Tento článek přispívá ke zjištění existujících korelačních studií exogenní manipulací přesvědčení jednotlivců o diskriminaci jejich menšiny a zkoumáním kauzálního vztahu mezi vnímanou diskriminací a chováním jednatelce na trhu práce. Za tímto cílem provádíme v USA online experiment s bohatým vzorkem 2000 Afroameričanů. Náhodně přiřazujeme jednotlivce do dvou skupin, kde jednu skupinu informujeme o zaznamenání diskriminace proti Afroameričanům v předcházejícím průzkumu. Následně sledujeme výsledky účastníků studie při řešení matematické úlohy a zkoumáme vliv informace o diskriminaci na vynaložené úsilí. Zjišťujeme, že většina původně nadhodnocuje diskriminaci vůči Afroameričanům. Poskytnutí informace vede k ekonomicky i statisticky významnému snížení nadhodnocení diskriminace. Jednotlivci vystaveni informaci o diskriminaci, obzvláště mužští účastníci, se pokusili vyřešit a úspěšně vyřešili méně matematických úloh ve srovnání s jednotlivci, kteří informaci o diskriminaci neměli. Naše výsledky proto nepodporují běžnou domněnku, že zvýšené očekávání diskriminace menšin vede k jejich nižšímu výkonu.

Klíčová slova: vnímaná diskriminace, rasové menšiny, úsilí

Working Paper Series
ISSN 2788-0443

Individual researchers, as well as the on-line version of the CERGE-EI Working Papers (including their dissemination) were supported from institutional support RVO 67985998 from Economics Institute of the CAS, v. v. i.

Specific research support and/or other grants the researchers/publications benefited from are acknowledged at the beginning of the Paper.

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Published by
Charles University, Center for Economic Research and Graduate Education (CERGE)
and
Economics Institute of the CAS, v. v. i. (EI)
CERGE-EI, Politických vězňů 7, 111 21 Prague 1, tel.: +420 224 005 153, Czech Republic.
Phone: + 420 224 005 153
Email: office@cerge-ei.cz
Web: <https://www.cerge-ei.cz/>

Editor: Byeongju Jeong

The paper is available online at <https://www.cerge-ei.cz/working-papers/>.

ISBN 978-80-7343-538-7 (Univerzita Karlova, Centrum pro ekonomický výzkum a doktorské studium)
ISBN 978-80-7344-643-7 (Národohospodářský ústav AV ČR, v. v. i.)