

Grosch, Kerstin; Rau, Holger A.

Article — Published Version

PROCEDURAL UNFAIR WAGE DIFFERENTIALS AND THEIR EFFECTS ON UNETHICAL BEHAVIOR

Economic Inquiry

Provided in Cooperation with:

John Wiley & Sons

Suggested Citation: Grosch, Kerstin; Rau, Holger A. (2020) : PROCEDURAL UNFAIR WAGE DIFFERENTIALS AND THEIR EFFECTS ON UNETHICAL BEHAVIOR, Economic Inquiry, ISSN 1465-7295, Wiley Periodicals, Inc., Boston, USA, Vol. 58, Iss. 4, pp. 1689-1706, <https://doi.org/10.1111/ecin.12906>

This Version is available at:

<https://hdl.handle.net/10419/233743>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<http://creativecommons.org/licenses/by/4.0/>

PROCEDURAL UNFAIR WAGE DIFFERENTIALS AND THEIR EFFECTS ON UNETHICAL BEHAVIOR

KERSTIN GROSCH¹ and HOLGER A. RAU*²

In this paper, we investigate how payment procedures that are deemed unfair can spur unethical behavior towards innocent coworkers in a real-effort experiment. In our Discrimination treatment, a highly unfair payment procedure with wage differentials, half the workforce is randomly selected and paid by relative performance whereas the remaining receives no payment. A joy-of-destruction game measures unethical behavior subsequently. Non-earners in Discrimination destroy significantly more than in the non-discriminatory control treatments. In Discrimination, unethical behavior is generally high for all non-earners, independent of individual inequality aversion and relative performance beliefs. In the control treatments, inequality aversion is the main driver of destructive behavior. (JEL C91, D03, J33, J70, M52)

I. INTRODUCTION

Ethical behavior is crucial for sustaining cooperative behavior and to promote the successful functioning of institutions (Shleifer 2004). Knowing that people violate social norms can stifle interactions and impede cooperation. A manifestation of unethical behavior is antisocial behavior, which generates efficiency losses and may arise as a consequence of frustration. In the company setting, empirical evidence reports that U.S. firms lose about \$50 billion each year because of white-collar crime, i.e., fraud and theft (Coffin 2003).¹ It is possible that these costs do

not only reflect direct revenge against the company or workers' antisocial actions for own material benefit. It is plausible that firm losses also arise because frustrated workers may indirectly affect the company's efficiency when they lash out on innocent coworkers. In this paper, we investigate these spillover effects of procedural unfairness in one domain, i.e., differential payment at the workplace, on antisocial behavior in another domain, i.e., unethical actions towards innocent coworkers.

Procedural fairness is an important predictor for organizational outcomes (McFarlin and Sweeney 1992). The concept refers to the way authorities allocate resources and can be described as people's degree of fairness perception of deployed procedures (Tyler and Lind 2002). Perfect procedural fairness is defined by an independent criterion for what constitutes a fair outcome of the procedure. The procedure must guarantee that a fair result will be achieved (Rawls 2009). In contrast, distributional fairness concerns the fairness perception of the amount of compensation.

At the workplace, differential payments are often claimed to be based on merit, that is, a higher performance leads to higher remuneration. However, it is likely that the allocation procedure of bonuses is not based on performance one-to-one since not all work processes can be impeccably monitored and part of the

*We thank Marcela Ibañez, Felix Kölle, Hans-Theo Normann, Jörg Oechssler, Henrik Orzen, Jonas Radl, researchers from "GlobalFood," participants at the HeiKaMax 2017, participants from conference audiences at the SEEDEC 2016, ESA 2017 world meeting in San Diego, and SABE 2018 for helpful comments. Financial support is acknowledged from the German Research Foundation "DFG" (grant number RTG 1666) and the University of Göttingen. We also want to thank the editor Tim Salmon and two anonymous referees for providing helpful comments.

[Correction added on 3 November 2020 after first online publication: Holger A. Rau has been assigned as corresponding author and Kerstin Grosch as co-corresponding author.]

Grosch: Post-doctoral researcher and co-corresponding author, Institute for Advanced Studies (IHS), Vienna, Austria. E-mail grosch@ihs.ac.at

Rau: Assistant professor and corresponding author, University of Göttingen, Göttingen, Germany. E-mail holger.rau@uni-goettingen.de

1. Similarly, Disselkamp (2004) reports that German firms bear costs of €50 billion because of inner dismissals, conflicts in the workplace, and high drop-out rates reflected in the number of staff on sick leave.

ABBREVIATION

JoD: Joy-Of-Destruction

workforce may not be considered for a bonus payment (French, Kubo, and Marsden 2000). There is substantial evidence demonstrating that the source of wage differentials, for example, discriminatory or non-discriminatory payment procedures, determines workers' fairness perceptions and acceptance of payments (e.g., Alesina and Angeletos 2005; Durante, Putterman, and Van der Weele 2014; Ku and Salmon 2013). As a consequence, unfair wage differentials may serve as a so-called *frustrator* resulting in dissatisfaction and resentment (Giacalone and Greenberg 1997). Survey data from the UK corroborates this idea, showing that more than one-third of financial professionals believe that bonuses given to top managers are unjustified and cause resentment in the office (CIMA 2016). In this study, we examine this nexus in the lab. We investigate spillover effects from a discriminatory payment regime with unjustified payments on antisocial behavior against innocent other workers. The term discrimination is often used when certain groups of people do not receive equal chances (e.g., for a bonus) on certain grounds such as race, gender, or age. In this paper, we take beliefs of discriminating reasons out of the picture and refer to the definition of Collin's English Dictionary which says that discrimination "[...] is the practice of treating one person or group of people less fairly or less well than other people or groups" (Collins Online English Dictionary 2019). We expect to find increased antisocial behavior when the payment procedure is discriminatory. There are several channels that may explain this effect.

First, people may feel frustrated when being discriminated against by a remuneration scheme. Hence, they need to release their negative emotions and vent them on other persons such as coworkers (Card and Dahl 2011; Munyo and Rossi 2013). Second, the allocation procedure may be categorized as an unethical action itself that is not aligned with social norms. Being treated unethically by a discriminatory payment regime may make people acting unethically themselves in turn. This is prompted by a study of Gino, Ayal, and Ariely (2009) who find that unethical behavior can be contagious and people are affected by the degree of unethical acts around them.

To investigate the link between discriminatory payment regimes and unethical behavior, we conduct a real-effort experiment. We use a subtle mode of discrimination in which half of the workforce take part in a competition for

bonuses whereas the performance of the other half of the workforce is not taken into account for calculating payments. We vary the procedures of payment regimes. Subsequently, we measure workers' engagement in antisocial actions. In the *Discrimination* treatment, half the participants are randomly selected and receive a zero payment ("non-earners"). The rest is promoted and competes for bonuses ("earners"). In this group, relative performance determines payments, that is, the 50% best-performing subjects receive €15 whereas the 50% least-performing subjects of this group earn €5.² By contrast, in the first control treatment (*Competition*) all payments are performance-based and there is no discrimination in terms of payment. Here, *all* workers participate in a competition for bonuses. The competitive payment regime is characterized by the transparency of payments in accordance with the subjects' relative performance. That is, workers receive information on their relative performance by the level of the bonus pay they earn. In a second control treatment (*Random*), there is not a competition for bonuses as all payments are randomly allocated to workers. Our outcome variable is subjects' antisocial behavior in a "joy-of-destruction (JoD)" game (Abbink and Herrmann 2011; Abbink and Sadrieh 2009). Here, a non-earner is paired with an earner and both decide how many canteen vouchers of their paired player they want to destroy. We are aware that the JoD game is a stylized setting to measure antisocial behavior at the workplace. Nevertheless, we believe that it is appropriate, as it enables us to measure antisocial behavior in a controlled way, which is hardly possible in the field. Although many workplace actions such as fraud and theft may be motivated by self-interest, it is plausible that this behavior may also arise as a consequence of workplace frustration due to discrimination by a payment regime. In this paper, we focus on this aspect and measure workers' antisocial behavior in a JoD game when being discriminated by a payment regime. Afterward, we implement a sequential prisoner's dilemma game to test whether a discriminatory payment regime dampens prosocial behavior as well (Buser and Dreber 2015; Grosch, Ibanez, and Viceisza 2017).

2. We deliberately decided not to create an employer-worker situation and we never inform subjects on their exact performance. This is because acts of discrimination can often neither be attributed to a single manager nor do workers know that they had deserved a bonus based on relative performance without any doubt.

JoD experiments find that people enjoy harming others even when these antisocial actions do not increase own monetary benefits (Abbink and Herrmann 2011; Abbink and Sadrieh 2009). Some studies suggest that inequality-aversion motives drive subjects' destruction levels (Fehr 2018; Zizzo 2003; Zizzo and Oswald 2001). Motivated by this evidence, we elicit inequality aversion (Blanco, Engelmann, and Normann 2011) before the crux of the experiment to scrutinize the explanatory power of these individual preferences. We hold wage differentials constant among payment groups across treatments to be able to differentiate between the effects of individual levels of inequality aversion and different payment regimes.

We find that, generally, non-earners destroy a larger fraction of vouchers than earners. Unethical behavior is more pronounced in the *Discrimination* treatment than in the control treatments. Inequality aversion only has explanatory power for non-discriminatory payment regimes but cannot explain the high destruction in the *Discrimination* treatment. The results suggest that workers in *Discrimination* are generally fed up by the procedural unfairness of the payment regime independent of their perception of relative performance. The findings in the sequential-prisoner's dilemma show that a discriminatory payment regime impairs cooperative behavior.

Theoretical work argues that unethical behavior is the result of situational and personal factors (Hunt and Vitell 1986; Trevino 1986). Our study makes several contributions to the related literature. First, we contribute to the literature on personal factors influencing unethical behavior. There is evidence that high social class and individual social preferences make people more likely to break the law, steal, and cheat (Grosch and Rau 2017; Piff et al. 2012). We add to this literature and identify individual inequality aversion as a driver of unethical behavior when payment regimes are transparent.

Second, we contribute to the evidence on situational factors that determine the behavioral environment. A competitive environment, for example, can bring out unethical behavior such as child labor to prevail in the competitive market (Graafland 2010; Shleifer 2004). Moreover, the social environment and peers' behavior influence own ethical conduct (Gino, Ayal, and Ariely 2009; Zey-Ferrell and Ferrell 1982). Another example for a situational factor is (perceived) unfair procedures in an

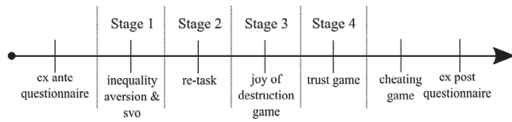
institution that can trigger retaliation behavior of employees. Several experimental studies have shown that the procedure accountable for a payment distribution affects subjects' redistribution decisions reflecting fairness perceptions of the applied procedures (e.g., Akbaş, Ariely, and Yuksel 2019; Blount 1995; Bolton, Brandts, and Ockenfels 2005; Cappelen et al. 2007, 2013; Konow 2000). When institutions violate procedural-fairness norms, people may refuse to accept unequal outcomes (Grimalda, Kar, and Proto 2016), may engage in cheating (Gill, Prowse, and Vlassopoulos 2013), lying (Banerjee, Gupta, and Villevall 2018), sabotage (Ambrose, Seabright, and Schminke 2002; Fehr 2018), or theft (Greenberg 1990) in retribution. Moreover, procedural unfairness at the workplace can lower workers' intrinsic motivation (e.g., Breza, Kaur, and Shamdasani 2018; Cohn et al. 2014; Gächter and Thöni 2010; Heinz et al. Forthcoming), work satisfaction (Breza, Kaur, and Shamdasani 2018), and labor supply (Bracha, Gneezy, and Loewenstein 2015). In contrast to the aforementioned studies, we do not focus on antisocial behavior as a retributive justice motive, or on situations in which it is individually beneficial to act unethically. Instead, we focus on the consequences of a discriminatory payment scheme, characterized by unequal chances of promotion, on antisocial behavior towards innocent coworkers. In our scenario, coworkers are not responsible for experiencing unfair treatment. Whereas other studies look at positive spillover effects from an institution to prosocial behavior (e.g., Engl, Riedl, and Weber 2018; Galbiati, Henry, and Jacquemet 2018), we provide evidence on negative spillover effects from unfair procedures in one domain on unethical conduct in another domain. These side effects can provide important insights that should be factored in when evaluating the efficiency of payment institutions.

II. EXPERIMENTAL DESIGN

A. *Experimental Framework*

The experiment consists of a short presurvey, the main part, and an ex post questionnaire. The sequence of actions is illustrated in Figure 1. After a brief questionnaire, we elicit the inequality-aversion parameters of the Fehr and Schmidt (1999) model with the method introduced by Blanco, Engelmann, and Normann (2011) (Stage 1). For two-player games, a

FIGURE 1
Experimental Sequence



Fehr and Schmidt (1999) function is given by:

$$U_i(x_i, x_j) = \begin{cases} x_i - \alpha_i(x_j - x_i) & \text{if } x_i \leq x_j \\ x_i - \beta_i(x_i - x_j) & \text{if } x_i > x_j, \end{cases}$$

where x_i and x_j , $i \neq j$ denote the monetary payoffs of the two players. The model implies that a subject's utility decreases by disadvantageous inequality (i.e., when subject i has a lower income than subject j) and it decreases by advantageous inequality (i.e., when subject i has a higher income than subject j). The degree of utility loss from a situation characterized by disadvantageous inequality is captured by the parameter α (envy parameter) whereas β (guilt parameter) captures the utility loss in a situation characterized by advantageous inequality aversion.

The method of Blanco, Engelmann, and Normann (2011) elicits these two parameters. The method is based on choice sets with varying money allocations between oneself and another participant. Participants then have to decide for their preferred allocations using the strategy method. Based on their decisions *alpha*, that is, the aversion towards disadvantageous inequality and *beta*, that is, the aversion towards advantageous inequality, can be calculated. The aversion parameters *alpha* and *beta* increase in magnitude the more pronounced subject's inequality aversion is. We keep this procedure constant across treatments. To rule out spillover effects, we do not inform subjects of the outcome in these games before the main experiment was finished. The details of Blanco, Engelmann, and Normann's (2011) elicitation mechanism can be found in the Appendix (Supporting information). We summarize the subsequent stages and the ex-post survey in the following.

Stage 2: Real-Effort Task. In this stage, subjects work in a real-effort task in which we vary the payment regime exogenously. The 8-minute task involves counting zeros individually in 5×9 matrices, consisting of random numbers of zeros and ones. After completion of the task, half the participants are assigned to the group of "earners"

TABLE 1
Summary of Treatments

Treatment	Non-discriminatory	All Workers are Paid Performance-Based (Merit Pay)
<i>Discrimination</i>	x	x
<i>Competition</i>	✓	✓
<i>Random</i>	✓	x

and the remaining half is assigned to the group of "non-earners." Earners receive €15 or €5 whereas non-earners receive €0. We keep the payment distribution constant among participants: 50% of the workforce receive €0, 25% earn €5, and 25% earn €15. In the three treatments, we vary how payments are allocated to participants.

Across treatments, we switch *two* determinants on and off: (1) *discrimination* in the opportunity to receive a bonus and whether (2) *all workers are paid performance-based*. First, "discrimination" can be defined as treating a particular group of people differently, for example, withdrawing *equal* opportunities such as participation in a competition for bonuses. Second, we refer to a payment scheme that is "performance-based" when *all* payments depend on relative performance. Hence, in a performance-based payment procedure, better-performing workers receive at least as much of a payoff as an equivalent-performing worker per design. Table 1 illustrates which determinants matter within the different treatments. We elaborate on the design details of the *Discrimination* treatment and the two non-discriminatory treatments in the following paragraphs.

In *Discrimination*, we create a payment regime with neither equal opportunities nor correct treatment for all workers. Participants are randomly assigned to either the group of non-earners or the group of earners. The performance of non-earners is ignored when determining the payoffs and, therefore, they are discriminated against. In contrast, participants within the group of earners are ranked based on their total number of correctly solved matrices. The workers ranked in the upper half of the distribution receive €15 and those ranked in the lower half receive €5.

In contrast, in the *Competition* treatment, all participants are treated equally and the remuneration is performance-based. In this treatment, a performance ranking among *all* participants is executed. The ranking determines the assignment

to the group of non-earners and earners and the respective payments. Participants who rank in the first quartile of the distribution earn €15, participants who rank in the second quartile of the distribution earn €5. They are assigned to the group of earners. Workers who rank in either the third or fourth quartile receive nothing and are assigned to the group of non-earners. Hence, there is no room for discrimination, as all payments are always a direct consequence of relative performance.

We run another control treatment called *Random*. Here, not only the assignment to the group of earners and non-earners is imposed randomly but we also cut off competition within the earner group and distribute bonuses completely randomly. As a consequence, all workers are paid independent of their relative performance. Since all workers still have an equal chance of receiving a bonus, the payment regime can be called non-discriminatory. However, no worker is treated by the performance-based scheme, as the random payment mechanism ignores workers' individual performance. The treatment comparison of workers who did not work under a performance-based scheme such as *Random* and *Discrimination* enables us to disentangle the effects of discrimination from being treated differently.

Subjects are informed about the payment procedures before they work on the task. We apply this feature as it is more realistic than informing subjects on the payment regime after they have worked. We made use of a neutral framing and called earners "participant A" and non-earners "participant B."³

Stage 3: JoD Game. We modify the JoD game by Abbink and Sadrieh (2009). In the beginning, all participants are virtually endowed with six canteen vouchers each.⁴ A non-earner is matched with an earner. Each participant (non-earner and earner), then, simultaneously decides on how many vouchers between 0 and 6 s/he wants to

destroy from the matched participant.⁵ Decisions are entered on a computer screen and destruction is free of cost. We also implement a random parameter that destroys vouchers with a 50% probability. In this case, the computer randomly destroys 0–6 vouchers. When the computer's choice is implemented, all levels from 0 to 6 are equally likely. In the other 50% of the cases, the participant's decision determines the number of vouchers destroyed. The implementation of the random parameter reduces moral costs since mean actions can be hidden under the guise of a possible random event (Abbink and Herrmann 2011). In real life, in many cases, antisocial actions such as stealing from bullying coworkers cannot be traced back to one particular person, and mean actions can be hidden as well. Information about the number of devalued vouchers is only revealed at the very end of the experimental session.

Participants receive information about the random parameter and its likelihood to destroy. They only learn about which decision, their or the decision of the random parameter, had been implemented at the very end of a session. Before non-earners decide in the JoD game, they are informed about the matched partner's exact payment (€5 or €15) of the real-effort stage. Similarly, earners learn that they are matched with a non-earner. The JoD game is played one shot.

Stage 4: Cooperative Behavior. We use a sequential-move prisoner's dilemma (Blanco et al. 2014) to measure the spillover effects of unfair payment regimes on antisocial behavior and cooperation. All participants (independent of their earnings) are matched in dyads and receive no information about the matched partner. The first mover makes a binary decision and chooses to cooperate or to defect. Similarly, the second mover responds with either cooperation or defection. When the first mover defects, the decision of the second mover becomes irrelevant and both receive a payoff of 10 tokens. If both cooperate, they receive 14 tokens each. If the first mover cooperates and the second mover defects, the first mover earns 7 tokens and the second mover earns 17 tokens (for a game-tree illustration see experimental instructions in the Appendix, Supporting information). In this game, we apply the strategy method. To determine the payments,

3. For example, participants received the following information in the random treatment: "After completion of the task, the computer will randomly select 12 participants (out of 24). The 12 selected participants will be called participant As. They will be rewarded *independent* of the number of tasks they solved correctly. The other 12 participants are called participant Bs and do not receive a reward for this task. The payoffs for participant As are distributed based on a random ranking generated by the computer. The ranking is *independent* of the number of tasks solved correctly".

4. Students at the university hold a student identity card. This ID card is used to pay for meals at the university's canteen and can be topped up with credit. With one of our vouchers participants could top up their credit by €1.

5. We used a more neutral framing in the experimental instructions and applied the wording "you can remove vouchers." Subjects know that destroyed vouchers would become useless for both subjects.

one participant in each dyad is randomly selected into the role of the first mover and the other participant is selected into the role of the second mover. We apply an exchange rate of 1 token = €0.20. The sequential-move prisoner's dilemma is played one shot.

Questionnaires. At the very beginning of the session, participants fill out a short presurvey in which we collect baseline measures on subjects' mood and risk preferences. For this purpose, we ask subjects about their willingness to take risks on a scale between 1 (not prepared to take risks) and 10 (fully prepared to take risks) (Dohmen et al. 2012). After the experimental session, participants are asked about their fairness perceptions of the payment regime and additional questions. Moreover, we capture personality traits using the BIG-5 query (Costa and McCrae 1989).⁶ Finally, sociodemographic features such as age and study program are recorded.

Information Revelation. Subjects are only informed about their earnings at the very end of the experiment to avoid confounding effects from stage to stage. The only exception is the real-effort task. After being exposed to the treatment stage, we directly hand out envelopes and enclose a card on group affiliation, A (earners) or B (non-earners), and the respective banknotes (if any) they earned in this stage. Since our interest is to capture subjects' fairness perception of a payment regime, it was necessary to inform subjects about their payment in this stage. However, we neither inform participants explicitly about their absolute performance in the real-effort task nor about their relative performance to the other participants in the group to avoid another level of heterogeneity across the different groups we want to compare. Subjects were informed whether their destruction decision or the computer's decision became relevant at the very end of the session.

B. Experimental Procedures

We collected the experimental data from June to August 2016. In total, 252 students from the University of Göttingen took part in 13

6. We do not report the BIG-5 results on antisocial behavior in the paper. However, we find that more pronounced neuroticism leads to more destructive behavior whereas higher levels of agreeableness and conscientiousness lead to significantly less destruction in the JoD game. These personality effects are in line with findings from empirical studies (e.g., Jones, Miller, and Lynam 2011).

sessions. In each session, we had 16–24 participants. The experiment was programmed and conducted in z-Tree (Fischbacher 2007). Subjects from various fields of study were recruited with ORSEE (Greiner 2015). The sessions lasted approximately 90 minutes and subjects earned €17 (ca. \$18.90) on average.

C. Hypotheses

We expect that, in general, non-earners destroy more than earners, as they lag behind the incomes of earners. It has been shown that people who have relatively less money than others burn money of the better-off to equalize payoffs (e.g., Fehr 2018; Zizzo 2003, 2004). Since this phenomenon has been demonstrated in different contexts and seems to be robust, we expect that low earners destroy more than high earners across treatments in our set-up, too.

The treatment differences should depend on the nature of the payment procedures that we test in different settings. Procedures are perceived as unfair when conditions are considered disadvantageous for a group or when the procedure violates an existing moral tenet (Folger and Cropanzano 2001). Since the non-earners in the *Discrimination* treatment are left out of the competition for bonuses, they could be seen as being disadvantaged by the payment regime. Unethical behavior can also be a response to perceived procedural unfairness. First, the act of an institution of being procedural unfair can be categorized by people as an unethical action in itself which justifies being unethical oneself (Gino, Ayal, and Ariely 2009). Furthermore, workers may become frustrated and relieve their negative emotions in an unethical act harming an innocent other person (Giacalone and Greenberg 1997; Neuman 2004). Based on relative deprivation theory (Davis 1959), people in a deprived group might compare their payoff relative to peoples' payoff in another privileged group. Transferred to our experiment, in the *Discrimination* treatment, we should find that non-earners may compare themselves to earners and may feel deprived since they are not paid as the other half of the workforce what they may deem as procedurally unfair. Hence, we expect that subjects' unfairness perception is particularly pronounced in the *Discrimination* treatment, as subjects do not know whether being not paid was justified by performance. In contrast, non-earners in the *Competition* treatment know that their relatively poor performance is the reason for their zero payment.

As there is no competition at all in *Random*, non-earners cannot feel deprived of the right to take part in a competition. Therefore, frustration should be lower and non-earners should become more antisocial under a discriminatory than under a random payment regime. This way, non-earners may be more accepting and less frustrated in the control treatments compared to non-earners in the *Discrimination* treatment (Bracha, Gneezy, and Loewenstein 2015). We summarize these trains of thought in the first two hypotheses.

Hypothesis 1: *Destructive behavior of non-earners*

a. *Non-earners destroy significantly more vouchers than earners.*

b. *Non-earners in the Discrimination treatment destroy significantly more vouchers than non-earners in the Competition and Random treatments.*

We strive to shed light on the mechanisms, too. Part of the explanation for non-earners' destructive behavior may be individual inequality aversion. Experiments studying antisocial behavior report that subjects burn money to equalize incomes (e.g., Fehr 2018; Zizzo 2003, 2004). The real-effort framework is characterized by wage differentials, which lead to income inequality between earners and non-earners. Non-earners' utility loss may increase with an increasing level of disliking disadvantageous inequality (e.g., Card et al. 2012; Fehr and Schmidt 1999). Hence, particularly inequality-averse non-earners may try to level the playing field with earners by burning vouchers. It follows that the amount of destroyed vouchers depends on non-earners' level of aversion towards disadvantageous inequality.

Hypothesis 2: *The destruction level depends on the degree of non-earners' aversion towards disadvantageous inequality.*

Another mechanism at play may be the incorrect treatment by the payment regime, that is, earning less than deserved by relative performance. In the *Competition* treatment, all participants are paid based on their relative performance. In contrast, in the *Discrimination* treatment there may be subjects in the earner group, particularly among the ones earning €5, with relatively poor performance compared to all participants in the session. Even subjects earning €15 may have lower performance than some of the subjects in the non-earner group. In *Random*,

in which payments are completely random, there are paid subjects who did not deserve their payments, as their relative performance may be lower than the performance of non-earners. The likelihood to belong to the earner group with relatively low performance is highest in *Discrimination* and lowest in *Competition*. Knowing that there is a chance that the matched participant does not deserve his/her payment by relative performance level and that not everybody is treated equally, may make non-earners to perceive the payment procedure of *Discrimination* as less procedurally fair. Particularly non-earners who think that they were discriminated against, that is, workers who hold the belief that they deserved a payment by performance, may feel entitled to take part in the competition for bonuses (Clark and Oswald 1996; Crosby 1976; Gurr 1970). This feeling of entitlement may make these subjects more frustrated and antisocial than subjects who did not hold this belief.

Hypothesis 3: *Workers who believe that they were discriminated against by the payment regime destroy more than workers who do not hold this belief.*

Cooperative behavior, which can be seen as the flipside of antisocial behavior, is essential for well-functioning institutions. It has been shown that the origin of endowments may matter for cooperative behavior (e.g., Kroll, Cherry, and Shogren 2007). In our set-up, the real-effort task precedes the cooperation game and does not determine endowments for the cooperation game. However, the level of the unfairness of a payment procedure may moderate beliefs about other people's cooperativeness (e.g., Kocher et al. 2015). Moreover, the unfair procedure may threaten people's needs for control, certainty, and belonging (De Cremer and Tyler 2005). When there is a lack of perceived belonging and identification within groups, cooperation can decrease (e.g., Tyler and Blader 2001). As a consequence, we expect that cooperation decreases under a discriminatory payment scheme in which there may be a lack of identification with the coworkers due to the unfair payment procedure.

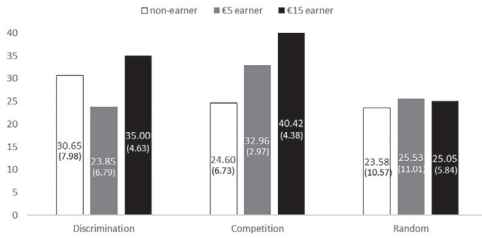
Hypothesis 4: *Workers are less cooperative under a discriminatory payment regime compared to workers under non-discriminatory payment regimes.*

III. RESULTS

This section first focuses on subjects' performance to justify discrimination and we compare

FIGURE 2

Subjects' Performance within Payment Groups with Standard Errors in Parentheses



effort levels and respective payments across treatments. Then, we will focus on our main outcome variable, that is, destructive behavior in the JoD game. Afterward, we pin down potential mechanisms and examine the role of inequality aversion and performance beliefs. Finally, we examine whether a discriminatory payment procedure also dampens cooperative behavior. When applying nonparametric tests we always report two-sided p values throughout.

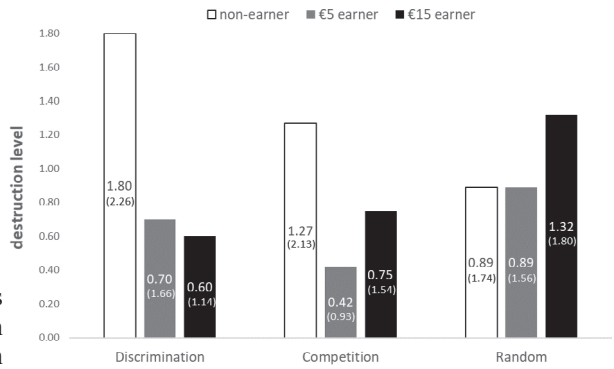
A. Main Results

We start to report subjects' performance conditioned on the earnings they received. This way, we can verify whether non-earners were discriminated against and received no payment unjustifiably in the *Discrimination* treatment. Figure 2 displays an overview of subjects' performance in the three treatments.

The performance distributions across payment groups are as expected and we describe them in the following. In the *Competition* treatment, participants are paid based on performance. As a consequence, subjects' performance monotonically increases in their payment level. On average, earners solved 12 grids more than non-earners in the *Competition* treatment (Mann–Whitney test, $p < 0.001$). This distribution results from obvious sorting by design. By contrast, in *Discrimination*, non-earners achieve a significantly higher performance (30.65) than subjects who received a €5 payment (23.85) (Mann–Whitney test, $p = 0.003$) and than non-earners in the *Competition* treatment (24.60) (Mann–Whitney test, $p = 0.001$). This suggests that a substantial fraction of non-earners were not paid based on performance in *Discrimination*. This is resulting from the design and as expected some hard workers are assigned to the non-earner group in the *Discrimination* treatment. In *Random*, we find no significant performance

FIGURE 3

Destruction Levels of Non-earners and Earners (Standard Deviations in Parentheses)



difference between any of the earner groups (all Mann–Whitney tests are at least $p > 0.514$). This is because different performance types are uniformly distributed across payment groups. Interestingly, subjects achieve a relatively high performance although the payment is not linked to performance. This is in line with the findings of Benndorf, Rau, and Sölch (2019). An explanation may be that subjects are bored and face low effort costs.

We turn to subjects' antisocial behavior, that is, the average number of destroyed vouchers across treatments. Figure 3 displays the average level of destroyed vouchers across treatments and earner groups (non-earners: white bars, €5 earners: gray bars, €15 earners: black bars). The standard deviations are presented in parentheses. More detailed descriptives can be found in Table S2 (Supporting information). On average, the destruction level of non-earners (1.33) is significantly higher as compared to earners (0.76) (Mann–Whitney test, $p = 0.050$) confirming Hypothesis 1a.

The difference is particularly pronounced in *Discrimination* where non-earners destroy significantly more vouchers (1.80) than €5 earners (0.70) (Mann–Whitney test, $p = 0.033$) and €15 earners (Mann–Whitney test, $p = 0.045$). The difference is less pronounced in the non-discriminatory *Competition* treatment where non-earners (1.27) destroy insignificantly more than €5 earners (0.42) (Mann–Whitney test, $p = 0.201$) and €15 earners (0.75) (Mann–Whitney test, $p = 0.430$). In *Random* where the payment regime is also non-discriminatory, we find no significant

TABLE 2
Ordered Logit Regressions on Destruction Levels of Non-earners Versus Earners

	Destruction Level		
	All Workers	Non-Earners	
	(1)	(2)	(3)
<i>Discrimination</i> × non-earner	1.187** (0.599)		
<i>Discrimination</i> × €5 earner	-0.369 (0.793)		
<i>Competition</i> × non-earner	0.384 (0.628)		
<i>Competition</i> × €5 earner	-0.221 (0.726)		
<i>Competition</i> × €15 earner	0.281 (0.713)		
<i>Random</i> × non-earner	0.154 (0.660)		
<i>Random</i> × €5 earner	0.102 (0.731)		
<i>Random</i> × €15 earner	0.768 (0.703)		
<i>Performance</i>	-0.011 (0.018)	0.006 (0.023)	0.000 (0.037)
<i>Discrimination</i> × matched with €5		1.287* (0.685)	1.533* (0.883)
<i>Discrimination</i> × matched with €15		1.416** (0.684)	1.702* (0.878)
<i>Random</i> × matched with €5		0.267 (0.740)	-0.092 (1.034)
<i>Random</i> × matched with €15		0.657 (0.722)	1.277 (0.884)
<i>Competition</i> × matched with €15		1.104* (0.668)	1.431* (0.791)
<i>Alpha</i>	0.203** (0.081)	0.301*** (0.108)	0.264* (0.139)
<i>Beta</i>	-0.769* (0.460)	-1.197* (0.641)	-0.984 (0.791)
Obs.	252	126	82
Pseudo R ²	0.037	0.060	0.078

Note: Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

difference between the destruction levels of non-earners and earners (Mann–Whitney test, $p = 0.463$) as well. The results are robust when focusing on destruction frequencies, that is, in *Discrimination*, non-earners destroy significantly more often than both earner groups. By contrast, these differences cannot be found in *Competition* and *Random*.⁷ To summarize, the results show that a discriminatory payment

7. In *Discrimination*, non-earners destroy significantly more often (50%) than €5 earners (20%) ($\chi^2(1) = 5.000$; $p = 0.025$) and €15 earners (25%) ($\chi^2(1) = 3.429$; $p = 0.064$). In *Competition*, no significant differences can be observed between the destruction frequencies of non-earners (31%) and €5 earners (21%) ($\chi^2(1) = 0.865$, $p = 0.352$) and €15 earners (0.25%) ($\chi^2(1) = 0.865$, $p = 0.582$). The same holds in *Random* where no significant differences can be observed between the destruction frequencies of non-earners (29%) and €5 earners (32%) ($\chi^2(1) = 0.042$, $p = 0.838$) and €15 earners (42%) ($\chi^2(1) = 0.987$, $p = 0.321$).

regime fosters antisocial behavior of subjects who receive no earnings under these unequal opportunities. As a consequence, they destroy more vouchers than earners. By contrast, this effect does not occur in *Competition* and *Random*. The findings are confirmed by ordered logit regressions (see Table 2) which reveal significant treatment differences when focusing on the destruction-level differences of non-earners and €5 and €15 earners.

Model 1 applies indicator variables in which the first variable refers to the treatment and the second variable to subjects' payment level. *Alpha* (*Beta*) controls for subjects' aversion to disadvantageous (advantageous) inequality. In model 1, we omit €15 earners in the *Discrimination* treatment. The first regression shows that only the coefficient of *Discrimination* × non-earner is positive and significant. This confirms that non-earners in the discriminatory treatment

destroy substantially more vouchers than €15 earners. A Wald test shows that the coefficient of *Discrimination* \times *non-earner* is significantly higher than the coefficient of *Discrimination* \times *€5 earner* ($p = 0.018$). This highlights that non-earners in *Discrimination* also destroy more than €5 earners. The difference in destruction levels of non-earners and earners becomes insignificant in the *Competition* and *Random* treatment. In model 2, we focus on the subsample of non-earners to test for treatment effects across non-earners in our treatments.

We control for interaction effects of the treatment and the payment level of the matched earner. We interact indicator variables for the treatments with the matched partner's payment level. We omit the case in which a non-earner in the *Competition* treatment is matched with a €5 earner. The model demonstrates that non-earners in the *Discrimination* treatment destroy more vouchers than non-earners in the *Competition* treatment.

Non-earners with relatively low performance may generally differ in their antisocial behavior as compared to subjects with a relatively high performance.⁸ We control for subjects' performance (*Performance*) in all three regressions in Table 2, but the coefficient of *Performance* is close to zero and not significant in any of the regressions. To further rule out that performance drives the treatment effect, we focus on the subsample of non-earners with a below/equal-median performance in our three treatments (29 correctly solved puzzles) in model 3. The regression results of model 3 are similar to the results in model 2 demonstrating that the treatment effects are independent of performance differences.

We conducted a second robustness check for potential self-selection into the non-earner group based on individual characteristics. Here, we compare non-earners' characteristics and their effect on destruction levels across treatments. The results are presented in Table S1 (Supporting information). We do not find significant treatment differences between non-earners' characteristics such as alphas, betas, their SVO angle (Kolmogorov–Smirnov tests, all nine pairwise comparisons, $p > 0.657$), and gender (χ^2 tests, all three pairwise comparisons, $p > 0.506$). This demonstrates that non-earners destroy higher levels in the *Discrimination* treatment than in the

other treatments, independent of non-earners' preferences and gender.

In summary, we find that non-earners in *Discrimination* destroy significantly more than non-earners in *Competition*. No difference occurs for the destruction levels of non-earners between the treatments with non-discriminatory payment regimes (*Random*, *Competition*), which is in line with the previous findings of the non-parametric tests. Hence, we confirm Hypothesis 1b. Model 2 highlights that our findings hold irrespective of the payment level of the matched earner. Non-earners in *Discrimination* always destroy significantly more than non-earners in *Competition* who are matched with €5-earners.⁹ Non-earners in the *Competition* treatment who are matched with €15 earners destroy moderately more than non-earners who are matched with €5 earners. Again, we find no significant differences between the behavior of non-earners in *Random* and *Competition*. Generally, subjects with a higher (lower) aversion towards disadvantageous inequality destroy more (less). Moreover, subjects with a higher (lower) aversion towards advantageous inequality destroy less (more). Finally, our robustness checks in model 3 and Table S1 (Supporting information) confirm the findings of model 2. The treatment effects are independent of individual characteristics and performance differences within the non-earner group across treatments demonstrated by robustness checks in model 3 and Table S1 (Supporting information).

Result 1:

- a. *Non-earners destroy significantly more than earners.*
- b. *In Discrimination this effect is more pronounced than in the control treatments, and it is not driven by a selection bias.*
- c. *Destruction levels of non-earners do not differ between Competition and Random. This highlights the importance of the non-discriminatory nature of payment regimes.*

Next, we analyze the mechanisms of destructive behavior. In particular, we examine

9. A closer look reveals that there is no treatment effect when comparing the data with the destruction levels of non-earners in *Competition* who were matched with €15-earners. Our analyses in Section B will show that this can be explained by individual inequality aversion which only plays an important role in the *Competition* treatment. That is, inequality-averse non-earners who earned substantially less than their matched (€15) earner destroy particularly high amounts of vouchers.

8. We thank an anonymous referee and Tim Salmon for raising this issue.

the impact of inequality aversion and test Hypothesis 2. Furthermore, we will test Hypothesis 3 and analyze if workers who believed that they were discriminated by the payment regime, that is, receiving a payment which is unjustified in terms of perceived individual relative performance, destroy more than workers who did not hold this belief.

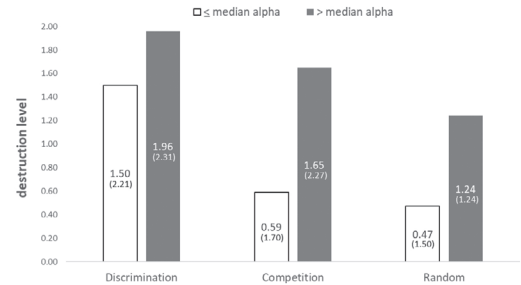
B. Mechanisms: Inequality Aversion

Individual levels of inequality aversion may explain why workers destroy vouchers. In all treatments, we keep the distribution of payments constant. It is only the payment procedure that differs across treatments. To test whether the treatment effect is driven by the non-discriminatory payment regime alone and not by a combination of inequality aversion and the payment conditions (which may be more amplified in the *Discrimination* treatment), we focus on the explanatory power of inequality aversion in the three treatments. If inequality aversion can explain destructive behavior of non-earners in our control treatments, but not in the discriminatory treatment, we can rule out inequality aversion as a major driver of destructive behavior in *Discrimination*. In this case, workers' perception of the payment procedure per se and not the resulting inequality in payments must drive the higher level of destructive behavior in *Discrimination*.

Non-earners always fall short of earners in terms of total income including the payment in the real-effort task and the value of vouchers to keep. A reduction of the income disparity is possible when non-earners burn more vouchers than their counterparts.¹⁰ Figure 4 depicts non-earners' destruction levels conditional on their aversion to disadvantageous inequality (alpha), standard deviations in parentheses. For the analysis, we condition subjects on the median alpha of the whole data set (0.93). We distinguish between non-earners with an above and a below or equal-median alpha.

On average, non-earners with an above-median alpha destroy more than non-earners with a below- or equal-median alpha. As can be seen in Figure 4, this relation holds in the

FIGURE 4
Destruction Levels of Non-earners Conditioned on Aversion to Disadvantageous Inequality (Standard Deviations in Parentheses)



treatments with a non-discriminatory payment regime. That is, Spearman's rank correlation coefficient tests show a significant positive correlation between non-earners' alpha and their destruction levels (*Competition*: $\rho = 0.281$, $p = 0.053$; *Random*: $\rho = 0.389$, $p = 0.016$). In both treatments, non-earners with an above-median alpha destroy significantly more than non-earners with a below-median alpha (both Mann-Whitney tests, $p < 0.055$). By contrast, under a discriminatory payment regime there is no significant correlation between disadvantageous inequality aversion and non-earners' destruction levels ($\rho = 0.160$, $p = 0.325$) and destruction levels do not differ between below (above) median performance within the non-earner group (Mann-Whitney test, $p = 0.543$). Overall, Figure 4 emphasizes that other than in the control treatments, destruction levels in *Discrimination* are always high, independent of the level of non-earners' aversion towards disadvantageous inequality aversion. This is confirmed by Mann-Whitney tests showing that non-earners with a below-median alpha destroy significantly more in *Discrimination* than in *Competition* (Mann-Whitney test, $p = 0.079$) and than in *Random* (Mann-Whitney test, $p = 0.059$). We conclude that inequality aversion only matters in *Competition* and *Random*. When the payment regime is discriminatory, other factors seem to induce a generally high destructive behavior which is not (unambiguously) affected by disadvantageous inequality aversion. Thus, unethical behavior is not solely triggered by inequality aversion when wage differentials are highly procedural unfair. Therefore, we only find support

10. Note that when non-earners are matched with earners €5, they could equalize incomes by destroying all of their vouchers. However, equalizing incomes also requires that €5-earners do not destroy more than one voucher from a matched non-earner. It is never possible for non-earners to catch up to €15-earners.

for Hypothesis 2 in *Competition* and *Random* but not in *Discrimination*.

Result 2:

a. *Non-earners' inequality aversion explains destruction levels in the Competition and Random treatments.*

b. *Inequality aversion does not have explanatory power in the Discrimination treatment.*

Next, we focus on perceived relative performance as an alternative explanation for unethical behavior.

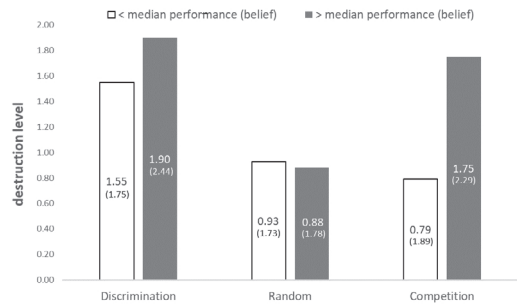
C. Mechanisms: Beliefs on Performance

Recall that subjects in the *Discrimination* treatment were randomly assigned to the earner- and the non-earner group and performance between earners and non-earners does not significantly differ on average in this treatment. Thus, there are subjects in the *Discrimination* treatment with an above-median performance who ended up being a non-earner. The same holds in the *Random* treatment. These “high performers” would have qualified for a payment in the *Competition* treatment that we categorize as more procedurally fair since all subjects are paid according to their relative performance. In this section, we test Hypothesis 3 for non-earners who believed that they achieved an above-median performance in the *Discrimination* and *Random* treatments. We analyze whether they may be particularly fed up with these payment regimes. Since workers do not know their real performance, we focus on non-earners' beliefs of having deserved to become an earner by their relative performance. We elicited these beliefs in an incentivized way after they completed the real-effort task and before they were informed on the payments of the real-effort task.¹¹

In the following, we compare non-earners who held the belief that they belong to the above-median performers with non-earners who

11. We implemented the incentives as follows. Subjects had to categorize their performance level relative to all other participants within the session. For this purpose, we formed four equally-sized groups ascending with performance and asked participants to choose one of the groups 1–4 (group 1 = best performance; group 2 = worst performance) they think they belong to. They received €0.50, if they correctly guessed their performance interval. In one session we had 20 participants which results in five groups of four. In this case, we only categorize subjects who guessed that they ranked in groups 1 and 2, as subjects who hold above-median performance.

FIGURE 5
Destruction Levels of Non-earners Conditional on Performance Beliefs and Treatments (Standard Deviations in Parentheses)



believed that they belong to the below-median performers. Figure 5 presents these data for the three treatments.

In the *Discrimination* treatment workers' antisocial behavior is almost independent of their belief of becoming an earner. We find that destruction levels are slightly higher for workers who believed that they had an above-median performance (1.90) as compared to workers who did not hold this belief (1.55) (Mann–Whitney test, $p = 0.974$). This difference is not statistically significant. Therefore, we reject Hypothesis 3. A similar pattern occurs in *Random* where destruction levels do not differ between non-earners who held a belief that they have a below-median performance and non-earners who believed that they have an above-median performance (Mann–Whitney test, $p = 0.985$). This could suggest that a payment regime lacking merit payment makes all people equally fed up independent of the discriminatory nature of the payment regime. An alternative explanation is that there is an interaction between subjects' ability and antisocial behavior such that non-earners with a high performance are less likely to destroy vouchers. This could mitigate the level of antisocial behavior relative to the non-earners who achieved a low performance. However, our robustness checks (model 3 of Table 2, and Table S1, Supporting information) show that antisocial behavior in *Discrimination* is not affected by such an interaction effect.

Turning to *Competition*, we find that non-earners who expected to deserve a payment destroy a similar amount (1.75) as non-earners in *Discrimination* (Mann–Whitney test, $p = 0.838$) and an insignificantly higher amount as compared to non-earners in *Random* (Mann–Whitney test,

$p = 0.109$) who had similar payment expectations. Interestingly, non-earners who believed that they had a below-median performance destroy a significantly lower amount (0.79) than non-earners who expected to deserve a payment in *Competition* (Mann–Whitney test, $p = 0.055$).

Result 3: *Non-earners generally destroy more in the Discrimination treatment independent of their belief of becoming an earner.*

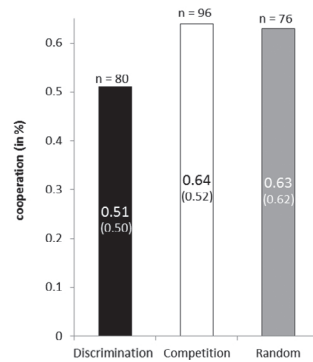
We can summarize that the source of inequality, that is, the discriminatory nature of the allocation procedure makes people behave more unethically in general. Noteworthy, under our discriminatory payment regime non-earners' dissatisfaction seems to be independent of their social preferences and a potential entitlement to their remuneration.

D. Effects on Cooperation

Our main results demonstrate that discrimination leads to more unethical behavior compared to *Competition* or *Random*. In this section, we will test Hypothesis 4 and assess whether discrimination and experienced antisocial behavior affects cooperative behavior as well. Here, we focus on the general sentiment of all subjects (non-earners and earners) who experienced a certain payment regime. Cooperative behavior is measured by using a sequential prisoner's dilemma game which we played after subjects made their decisions in the JoD game. At this stage, subjects did not know whether other subjects destroyed vouchers from them. The results on cooperation might be interpreted as another measure for social behavior. However, the measure is less hot-handed. Here, subjects' beliefs and expectations about the other person's behavior play a major role. Therefore, we may interpret lower levels of first-mover cooperation as a decline in the work climate in general. Figure 6 reports first-mover cooperation levels, standard deviations in parentheses.

It can be seen that the average cooperation rate is similar in the non-discriminatory payment regimes, that is, 64% of subjects cooperate in *Competition* and 63% of subjects cooperate in *Random*. In contrast, in *Discrimination*, workers show a lower degree of cooperation (51%). The finding is supported by logit regressions on first movers' likelihood to cooperate in the sequential prisoner's dilemma (Table 3). The regression table reports average marginal effects. In model 1, we include treatment dummies

FIGURE 6
Share of Cooperating Subjects (in %) across Treatments



(*Discrimination*, *Random*), a dummy (*non-earner*) which indicates whether subjects are non-earners, and a variable (*vouchers removed*) that controls for the number of vouchers that subjects destroyed from coworkers in the JoD game. The latter controls whether subjects' propensity to behave antisocially spills over to cooperation behavior.

We also include subjects' performance in the real-effort task (*Performance*) and the inequality-aversion parameters of the Fehr and Schmidt (1999) model (*Alpha*, *Beta*). In model 2, we interact the *non-earner* dummy with the treatment dummies. We omit the competition treatment. In model 3, we include control variables on subjects' gender, age, risk preferences, and another dummy variable of whether they are enrolled in an econ program.

Models 1–3 show that subjects cooperate significantly less when they experienced a discriminatory payment regime as compared to the *Competition* treatment. This is demonstrated by the significant coefficient of *Discrimination*. Model 3 highlights that the average probability of cooperation is 21% lower for first movers in the *Discrimination* treatment as compared to *Competition*. A Wald test shows that there is not a significant difference between *Discrimination* and *Random* ($p > 0.391$).

Generally, non-earners apparently cooperate less which is represented by the negative and significant coefficient of *non-earner* in models 2 and 3. However, models 2 and 3 show that the interactions of *non-earner* and the treatment dummies are insignificant. Thus, the treatment effect we observe for subjects in the

TABLE 3

Logit Regressions on Cooperation Levels of First Movers in the Sequential Prisoner's Dilemma

	Cooperation		
	(1)	(2)	(3)
<i>Discrimination</i>	-0.125* (0.071)	-0.187* (0.107)	-0.215** (0.106)
<i>Random</i>	-0.012 (0.077)	-0.094 (0.119)	-0.121 (0.118)
<i>Non-earner</i>	-0.097 (0.063)	-0.185* (0.111)	-0.214* (0.111)
<i>Vouchers removed</i>	-0.012 (0.017)	-0.011 (0.017)	-0.013 (0.017)
<i>Discrimination</i> × <i>non-earner</i>		0.117 (0.154)	0.148 (0.153)
<i>Random</i> × <i>non-earner</i>		0.140 (0.157)	0.154 (0.155)
<i>Performance</i>	0.001 (0.004)	0.000 (0.004)	0.000 (0.004)
<i>Alpha</i>	0.018 (0.018)	0.021 (0.018)	0.017 (0.018)
<i>Beta</i>	0.232** (0.093)	0.240** (0.094)	0.256*** (0.093)
Controls ^a	No	No	Yes
Obs.	252	252	252

Notes: The regressions report average marginal effects. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

^a Controls: gender, age, risk preferences and whether subjects studied economics. The only significant control variable is *econ* with a negative sign. That is, economist generally cooperate less.

Discrimination treatment is not induced by non-earners. A discriminatory payment regime generally lowers cooperation of all payment groups as compared to subjects who worked under a non-discriminatory payment regime. Moreover, *vouchers removed* is not significant, that is, higher levels of antisocial behavior do not translate to less cooperation in the sequential prisoner's dilemma. Subjects with an aversion towards advantageous inequality cooperate significantly more often, which is emphasized by the significant positive coefficient of *Beta*. We do not find that performance affects the results. We also do not find any treatment differences for second-mover cooperative behavior. The cooperation rate of second-movers is 65% in *Discrimination*, 66% in *Competition*, and 68% in *Random*. Thus, we can conclude that first movers decreased cooperation in *Discrimination* because they expected that second movers will be less cooperative. However, they held a wrong belief since trustworthiness seems not to be affected by the procedural fairness of the payment regime.

Result 4: *After experiencing a discriminatory payment regime, workers show lower cooperation levels compared to the non-discriminatory payment regime Competition. There is a similar level of trustworthiness across all three treatments.*

E. Postexperimental Questionnaire

After the experimental session, subjects rated their fairness perception of the payment procedure in an ex post questionnaire. Moreover, we asked subjects for their motivations to destroy.

Fairness Perception. To elicit fairness perceptions of payment regimes we asked participants: "How fair did you perceive your payment of Stage 2 (counting task)? Decide on a scale from 1 to 10, 1 signifies very unfair, and 10 very fair. You can grade your answer with the values in between." We find that earners report a higher degree of perceived fairness (*Discrimination*: 7.13; *Competition*: 7.54; *Random*: 6.97) as compared to non-earners (*Discrimination*: 3.45; *Competition*: 4.96; *Random*: 3.74). The Mann–Whitney tests of the reported levels between earners and non-earners are highly significant ($p < 0.001$) in all treatments. Focusing on earners in *Discrimination*, we do not find any treatment differences between *Competition* (Mann–Whitney test, $p = 0.393$) and *Random* (Mann–Whitney test, $p = 0.863$). Focusing on non-earners enables us to compare the fairness perceptions of subjects of the same income group who experienced different degrees of procedural fairness. We find that non-earners report a significantly lower perceived fairness in *Discrimination* than in *Competition* (Mann–Whitney test, $p = 0.002$). This is in line with our previous findings that a discriminatory payment scheme leads to a generally higher degree of frustration for non-earners than a competitive payment scheme. Interestingly, in *Random*, non-earners' perceived fairness is not significantly different from *Discrimination* (Mann–Whitney test, $p = 0.517$). An explanation for higher destruction rates in *Discrimination* compared to *Random* may be that workers under the random payment regime know that higher payments cannot be induced by higher performance in any way. Thus, their payoff expectations may be lower compared to *Discrimination* resulting in less frustration when realizing that they did not receive a high

payment. This suggests that in *Discrimination* antisocial behavior may be driven by a combination of the perceived unfair payment regime and the frustration when realizing that work effort did not pay off.

Stated Reasons to Destroy. All participants were asked about their reasons to destroy or not to destroy. We predefined possible answers dependent on the subject's destruction decision. In Table S3 (Supporting information), we present descriptive results for non-earners' reasons to destroy. In total, 36% of non-earners in *Discrimination* and 42% of non-earners in *Random* stated that the unfairness of the payment regime was the reason why they destroyed vouchers. In the competitive environment, the majority of non-earners (33%) justified their decision by referring to the existence of the random destruction parameter. Hence, those subjects argued that even if they had not destroyed any vouchers, the computer might destroy vouchers from the matched partner. This behavior may be interpreted as "joy of destruction" in which frustration plays a less important role (Abbink and Herrmann 2011; Abbink and Sadrieh 2009).

IV. CONCLUSION

In this paper, we analyze the impact of allocation procedures and procedural fairness on workers' unethical behavior. Specifically, we investigate how a discriminatory payment regime affects subsequent antisocial actions towards bystanders. We find that, in general, a substantial fraction of workers engage in antisocial behavior independent of the treatment, which is in line with other experiments in this area (e.g., Abbink and Herrmann 2011; Abbink and Sadrieh 2009). The novelty of our research question is that we examine how perceived unfair allocation procedures can spill over to unethical conduct. We want to emphasize that we do not focus on retribution attempts towards the institution or managers introducing payment unfairness. We also do not focus on retribution attempts against sabotaging coworkers. Instead, we designed our experiment in a way that a payment regime of a "faceless" institution is imposed on workers who can engage in antisocial actions towards coworkers who are not accountable for the (un)fair payment regime.

We find that a discriminatory payment procedure, characterized by unequal chances of

promotion, makes people more unethical. Particularly discriminated workers, who were not given the chance of promotion, relieve their resentment in destructive behavior that hurts better-off coworkers. In the vein of Folger and Konovsky (1989), people also cooperate less when there is pronounced procedural unfairness. Our results provide evidence that only the payment procedure itself triggers more antisocial behavior. Hence, the results highlight the importance of procedural fairness when designing institutional factors such as payment regimes to maintain individual satisfaction and prosocial behavior in general.

Remarkably, in our set-up, a competitive payment regime mitigates antisocial behavior—at least compared with the other payment schemes in our experiment. At first, this insight may be surprising as these market structures are often opposed to cooperative behavior (Buser and Dreber 2015; Grosch, Ibanez, and Viceisza 2017). Yet, our results highlight that competitive market structures may work as a transparent remuneration mechanism when all workers have equal opportunities to be evaluated on fair terms. However, if equal treatment cannot be guaranteed, discriminated workers might try to release their frustration at the workplace inducing potential costs.

A closer look at the potential mechanism reveals that under non-discriminatory payment regimes (*Competition*, *Random*), antisocial behavior can be partly predicted by individual inequality aversion (e.g., Fehr 2018; Zizzo 2003). More precisely, non-earners' destruction levels positively depend on their degree of disadvantageous inequality aversion when everybody has equal opportunities to receive a (high) bonus. In a regime where payments are discriminatory, however, inequality aversion is not the driving factor. Our analysis of perceived relative performance also shows that non-earners who believed that they were not paid performance-based do not destroy more than non-earners who did not hold this belief, neither in *Discrimination* nor in *Random*. This highlights that workers under a discriminatory payment regime, generally, behave more unethically independent of whether they believed that they deserved a better payment or not. Our questionnaire revealed that in the treatments where performance could matter for the payments workers perceived the discriminatory payment as significantly more unfair than the competitive payment regime. These results suggest that

perceived unfair payment regimes can evoke feelings of indignation (Card and Dahl 2011) overwriting actions based on (purely) inherent (inequality) preferences when workers realize that their effort did not pay off in these settings.

Although one may argue that our experimental design is somewhat artificial, we believe that it may resemble several procedures at the workplace in which the exact reasons for the decisions remain unclear. It is possible that workers are frustrated about the payment procedures in an institution but it is hard to retaliate against a (responsible) superior or, depending on the type of allocation procedure, against the institution. However, a limitation of the study might be that in some company settings employees may have ample opportunities to express their dissatisfaction with the procedures. It has been shown that workers respond to framing and intentional wage discrimination in gift-exchange games by retaliating against the employer (e.g., Charness, Frechette, and Kagel 2004; Charness and Levine 2007; Gächter and Thöni 2010). Therefore, we would expect that people would behave much more antisocially when they have the opportunity to retaliate against the “source” of the unfair wage differential than in our set-up. Since our experimental design only allowed to punish a bystander, we cannot make any predictions for potential retaliation actions the employee might take instead if s/he has a choice.

If one is willing to transfer our results to (public) institutions and society in general, we can find several examples where procedural fairness matters in real life. Hospitals, for instance, may offer medical treatments partly based on people’s willingness or ability to pay for it. This makes the nature of procedure somehow arbitrary and frustrating for patients who do not receive their preferred treatment. Another example could be the allocation of public funds. Here, the people in charge may underlie specific biases such as a sequential bias resulting in an unfair (unintended) allocation procedure of funds. Moreover, in academia, institutions and appointment committees may not always base their decisions purely on academic skills and performance. In summary, the procedural fairness of institutions may be crucial for the level of ethical conduct and ultimately the quality of relations and cooperation within society.

Our study may spur further research on the effects of discrimination and the determinants of unethical conduct. Bracha, Gneezy, and Loewenstein (2015) found that giving workers a reason

for unequal payments makes them more accepting of relatively low payment. This is in line with our observation in the *Competition* treatment in which subjects were informed that relative performance determines payoffs. In *Random*, subjects know that the outcome is purely based on a random process and therefore performance can never be the reason for the realized payment. Leaving wiggle room about the reasons why subjects may not be selected for promotion in a discriminatory treatment could be another interesting avenue to investigate. Certain groups of people with a specific characteristic such as gender, sexual orientation, physical attractiveness, or ethnicity (Leibbrandt, Wang, and Foo 2017; Price 2012; Ruffle and Shtudiner 2014), may be subject to discrimination more often than other groups in real life. In situations with non-standardized procedures, they may have a higher baseline probability to be discriminated against. However, it is possible that these people even overestimate their chances to become a victim of discrimination (Glover, Pallais, and Pariente 2017). Furthermore, we have found that a discriminatory payment procedure leads to similar overall performance as a competitive payment procedure. Other studies have shown that wage differentials arising from perceived unfair procedures can result in less effort exerted at the workplace (e.g., Cohn et al. 2014; Heinz et al. Forthcoming; Johnson and Salmon 2016; McGee and McGee 2019). Maybe due to the one-shot nature of our experiment, we did not observe any effects on workers’ motivation. Long-term consequences arising from discrimination on people’s intrinsic motivation, satisfaction, and trust levels may be detrimental for economic outcomes and worthwhile to investigate in future research.

REFERENCES

- Abbink, K., and B. Herrmann. “The Moral Costs of Nastiness.” *Economic Inquiry*, 49(2), 2011, 631–3.
- Abbink, K., and A. Sadrieh. “The Pleasure of Being Nasty.” *Economics Letters*, 105(3), 2009, 306–8.
- Akbaş, M., D. Ariely, and S. Yuksel. “When is Inequality Fair? An Experiment on the Effect of Procedural Justice and Agency.” *Journal of Economic Behavior & Organization*, 161, 2019, 114–27.
- Alesina, A., and G.-M. Angeletos. “Fairness and Redistribution.” *American Economic Review*, 95(4), 2005, 960–80.
- Ambrose, M. L., M. A. Seabright, and M. Schminke. “Sabotage in the Workplace: The Role of Organizational Injustice.” *Organizational Behavior and Human Decision Processes*, 89(1), 2002, 947–65.
- Banerjee, R., N. D. Gupta, and M. C. Villeval. “The Spillover Effects of Affirmative Action on Competitiveness and

- Unethical Behavior." *European Economic Review*, 101, 2018, 567–604.
- Benndorf, V., H. A. Rau, and C. Sölch. "Gender Differences in Motivational Crowding out of Work Performance." *Economic Inquiry*, 57(1), 2019, 206–26.
- Blanco, M., D. Engelmann, A. K. Koch, and H.-T. Normann. "Preferences and Beliefs in a Sequential Social Dilemma: A Within-Subjects Analysis." *Games and Economic Behavior*, 87, 2014, 122–35.
- Blanco, M., D. Engelmann, and H. T. Normann. "A Within-Subject Analysis of Other-Regarding Preferences." *Games and Economic Behavior*, 72(2), 2011, 321–38.
- Blount, S. "When Social Outcomes Aren't Fair: The Effect of Causal Attributions on Preferences." *Organizational Behavior and Human Decision Processes*, 63(2), 1995, 131–44.
- Bolton, G. E., J. Brandts, and A. Ockenfels. "Fair Procedures: Evidence from Games Involving Lotteries." *The Economic Journal*, 115(506), 2005, 1054–76.
- Bracha, A., U. Gneezy, and G. Loewenstein. "Relative Pay and Labor Supply." *Journal of Labor Economics*, 33(2), 2015, 297–315.
- Breza, E., S. Kaur, and Y. Shamdasani. "The Morale Effects of Pay Inequality." *The Quarterly Journal of Economics*, 133(2), 2018, 611–63.
- Buser, T., and A. Dreber. "The Flipside of Comparative Payment Schemes." *Management Science*, 62(9), 2015, 2626–38.
- Cappelen, A. W., A. D. Hole, E. Ø. Sørensen, and B. Tungodden. "The Pluralism of Fairness Ideals: An Experimental Approach." *American Economic Review*, 97(3), 2007, 818–27.
- Cappelen, A. W., J. Konow, E. Ø. Sørensen, and B. Tungodden. "Just Luck: An Experimental Study of Risk-Taking and Fairness." *American Economic Review*, 103(4), 2013, 1398–413.
- Card, D., and G. B. Dahl. "Family Violence and Football: The Effect of Unexpected Emotional Cues on Violent Behavior." *The Quarterly Journal of Economics*, 126(1), 2011, 103–43.
- Card, D., A. Mas, E. Moretti, and E. Saez. "Inequality at Work: The Effect of Peer Salaries on Job Satisfaction." *American Economic Review*, 102(6), 2012, 2981–3003.
- Charness, G., G. R. Frechette, and J. H. Kagel. "How Robust is Laboratory Gift Exchange?" *Experimental Economics*, 7(2), 2004, 189–205.
- Charness, G., and D. I. Levine. "Intention and Stochastic Outcomes: An Experimental Study." *The Economic Journal*, 117(522), 2007, 1051–72.
- CIMA. "Bonuses Cause Resentment at Two-Thirds of UK Firms." 2016. Accessed December 13, 2016. <http://www.cimaglobal.com/Press/Press-releases/2016/Bonuses-cause-resentment-at-two-thirds-of-UK-firms/>.
- Clark, A. E., and A. J. Oswald. "Satisfaction and Comparison Income." *Journal of Public Economics*, 61(3), 1996, 359–81.
- Coffin, B. "Breaking the Silence on White Collar Crime." *Risk Management*, 50(9), 2003, 8–9.
- Cohn, A., E. Fehr, B. Herrmann, and F. Schneider. "Social Comparison and Effort Provision: Evidence from a Field Experiment." *Journal of the European Economic Association*, 12(4), 2014, 877–98.
- Collins OnlineEnglish Dictionary. "Collins English Dictionary." 2020. Content retrieved from <https://www.collinsdictionary.com/dictionary/english>. Harper Collins Publishers.
- Costa, P. T., and R. R. McCrae. *The NEO-PI/NEO-FFI Manual Supplement*, Vol. 40. Odessa, FL: Psychological Assessment Resources, 1989.
- Crosby, F. "A Model of Egoistical Relative Deprivation." *Psychological Review*, 83(2), 1976, 85–113.
- Davis, J. A. "A Formal Interpretation of the Theory of Relative Deprivation." *Sociometry*, 22(4), 1959, 280–96.
- De Cremer, D., and T. R. Tyler. "Managing Group Behavior: The Interplay Between Procedural Justice, Sense of Self, and Cooperation." *Advances in Experimental Social Psychology*, 37, 2005, 151–218.
- Disselkamp, M. *Kostensparnis durch faire verhandlungsführung und mediation*. Frankfurt a. M., Germany: Bund, 2004, 171–202.
- Dohmen, T., A. Falk, D. Huffman, and U. Sunde. "The Intergenerational Transmission of Risk and Trust Attitudes." *Review of Economic Studies*, 79(2), 2012, 645–77.
- Durante, R., L. Putterman, and J. Van der Weele. "Preferences for Redistribution and Perception of Fairness: An Experimental Study." *Journal of the European Economic Association*, 12(4), 2014, 1059–86.
- Engl, F., A. Riedl, and R. A. Weber. "Spillover Effects of Institutions on Cooperative Behavior, Preferences, and Beliefs." CESifo Working Paper Series, 2018.
- Fehr, D. "Is Increasing Inequality Harmful? Experimental Evidence." *Games and Economic Behavior*, 107, 2018, 123–34.
- Fehr, E., and K. M. Schmidt. "A Theory of Fairness, Competition, and Cooperation." *Quarterly Journal of Economics*, 114(3), 1999, 817–68.
- Fischbacher, U. "z-Tree: Zurich Toolbox for Ready-Made Economic Experiments." *Experimental Economics*, 10(2), 2007, 171–8.
- Folger, R., and R. Cropanzano. "Fairness Theory: Justice as Accountability." *Advances in Organizational Justice*, 1, 2001, 1–55.
- Folger, R., and M. A. Konovsky. "Effects of Procedural and Distributive Justice on Reactions to Pay Raise Decisions." *Academy of Management Journal*, 32(1), 1989, 115–30.
- French, S., K. Kubo, and D. Marsden. "Why Does Performance Pay Demotivate: Financial Incentives Versus Performance Appraisal." Technical Report, Centre for Economic Performance, LSE, 2000.
- Gächter, S., and C. Thöni. "Social Comparison and Performance: Experimental Evidence on the Fair Wage–Effort Hypothesis." *Journal of Economic Behavior & Organization*, 76(3), 2010, 531–43.
- Galbiati, R., E. Henry, and N. Jacquemet. "Dynamic Effects of Enforcement on Cooperation." *Proceedings of the National Academy of Sciences of the United States of America*, 115(49), 2018, 12425–8.
- Giocalone, R. A., and J. Greenberg. *Antisocial Behavior in Organizations*. Thousand Oaks, CA: Sage Publications, Inc., 1997.
- Gill, D., V. Prowse, and M. Vlassopoulos. "Cheating in the Workplace: An Experimental Study of the Impact of Bonuses and Productivity." *Journal of Economic Behavior & Organization*, 96, 2013, 120–34.
- Gino, F., S. Ayal, and D. Ariely. "Contagion and Differentiation in Unethical Behavior: The Effect of One Bad Apple on the Barrel." *Psychological Science*, 20(3), 2009, 393–8.
- Glover, D., A. Pallais, and W. Pariente. "Discrimination as a Self-Fulfilling Prophecy: Evidence from French Grocery Stores." *The Quarterly Journal of Economics*, 132(3), 2017, 1219–60.
- Graafland, J. "Do Markets Crowd out Virtues? An Aristotelian Framework." *Journal of Business Ethics*, 91(1), 2010, 1–19.
- Greenberg, J. "Employee Theft as a Reaction to Underpayment Inequity: The Hidden Cost of Pay Cuts." *Journal of Applied Psychology*, 75(5), 1990, 561–8.

- Greiner, B. "Subject Pool Recruitment Procedures: Organizing Experiments with Orsee." *Journal of the Economic Science Association*, 1(1), 2015, 114–25.
- Grimalda, G., A. Kar, and E. Proto. "Procedural Fairness in Lotteries Assigning Initial Roles in a Dynamic Setting." *Experimental Economics*, 19(4), 2016, 819–41.
- Grosch, K., M. Ibanez, and A. Viceisza. "Competition and Prosociality: A Field Experiment in Ghana." Global-Food Discussion Paper Series No. 113, 2017.
- Grosch, K., and H. Rau. "Gender Differences in Honesty: The Role of Social Value Orientation." *Journal of Economic Psychology*, 62, 2017, 258–67.
- Gurr, T. R. *Why Men Rebel*. Princeton, NJ: Princeton University, 1970.
- Heinz, M., S. Jeworrek, V. Mertins, H. Schumacher, and M. Sutter. "Measuring the Indirect Effects of Adverse Employer Behavior on Worker Productivity – A Field Experiment." *The Economic Journal*, Forthcoming.
- Hunt, S. D., and S. Vitell. "A General Theory of Marketing Ethics." *Journal of Macromarketing*, 6(1), 1986, 5–16.
- Johnson, D., and T. C. Salmon. "Sabotage Versus Discouragement: Which Dominates Post Promotion Tournament Behavior?" *Southern Economic Journal*, 82(3), 2016, 673–96.
- Jones, S. E., J. D. Miller, and D. R. Lynam. "Personality, Antisocial Behavior, and Aggression: A Meta-Analytic Review." *Journal of Criminal Justice*, 39(4), 2011, 329–37.
- Kocher, M. G., P. Martinsson, D. Matzat, and C. Wollbrant. "The Role of Beliefs, Trust, and Risk in Contributions to a Public Good." *Journal of Economic Psychology*, 51, 2015, 236–44.
- Konow, J. "Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions." *American Economic Review*, 90(4), 2000, 1072–91.
- Kroll, S., T. L. Cherry, and J. F. Shogren. "The Impact of Endowment Heterogeneity and Origin on Contributions in Best-Shot Public Good Games." *Experimental Economics*, 10(4), 2007, 411–28.
- Ku, H., and T. C. Salmon. "Procedural Fairness and the Tolerance for Income Inequality." *European Economic Review*, 64, 2013, 111–28.
- Leibbrandt, A., L. C. Wang, and C. Foo. "Gender Quotas, Competitions, and Peer Review: Experimental Evidence on the Backlash against Women." *Management Science*, 64, 2017, 1–16.
- McFarlin, D. B., and P. D. Sweeney. "Distributive and Procedural Justice as Predictors of Satisfaction with Personal and Organizational Outcomes." *Academy of Management Journal*, 35(3), 1992, 626–37.
- McGee, A., and P. McGee. "After the Tournament: Outcomes and Effort Provision." *Economic Inquiry*, 57(4), 2019, 2125–46.
- Munyo, I., and M. A. Rossi. "Frustration, Euphoria, and Violent Crime." *Journal of Economic Behavior & Organization*, 89, 2013, 136–42.
- Neuman, J. H. "Injustice, Stress, and Aggression in Organizations," in *The Dark Side of Organizational Behavior*, edited by R. W. Griffin and A. M. O'Leary-Kelly. New York: John Wiley & Sons, 2004.
- Piff, P. K., D. M. Stancato, S. Côté, R. Mendoza-Denton, and D. Keltner. "Higher Social Class Predicts Increased Unethical Behavior." *Proceedings of the National Academy of Sciences of the United States of America*, 109(11), 2012, 4086–91.
- Price, C. R. "Gender, Competition, and Managerial Decisions." *Management Science*, 58(1), 2012, 114–22.
- Rawls, J. *A Theory of Justice*. Harvard University Press, 2009.
- Ruffle, B. J., and Z. Shtudiner. "Are Good-Looking People More Employable?" *Management Science*, 61(8), 2014, 1760–76.
- Shleifer, A. "Does Competition Destroy Ethical Behavior?" *American Economic Review*, 94(2), 2004, 414–18.
- Trevino, L. K. "Ethical Decision Making in Organizations: A Person-Situation Interactionist Model." *Academy of Management Review*, 11(3), 1986, 601–17.
- Tyler, T. R., and S. L. Blader. "Identity and Cooperative Behavior in Groups." *Group Processes & Intergroup Relations*, 4(3), 2001, 207–26.
- Tyler, T. R., and E. A. Lind. "Procedural Justice," in *Handbook of Justice Research in Law*. Springer, 2002, 65–92.
- Zey-Ferrell, M., and O. Ferrell. "Role-Set Configuration and Opportunity as Predictors of Unethical Behavior in Organizations." *Human Relations*, 35(7), 1982, 587–604.
- Zizzo, D. J. "Money Burning and Rank Egalitarianism with Random Dictators." *Economics Letters*, 81(2), 2003, 263–6.
- . "Inequality and Procedural Fairness in a Money-Burning and Stealing Experiment." *Research on Economic Inequality*, 11(155), 2004, 215–47.
- Zizzo, D. J., and A. J. Oswald. "Are People Willing to Pay to Reduce others' Incomes?" *Annales d'Economie et de Statistique*, (63/64), 2001, 39–65.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.
Appendix S1. Supporting information