Losing sense of fairness: How information about a level playing field reduces selfish behavior

Kajsa Hansson [a,*], Emil Persson [a], Shai Davidai [b], Gustav Tinghög [a,c]

[a] *Department of Management and Engineering, Division of Economics, Linköping University, 581 83, Linköping, Sweden*
[b] *Management Division, Columbia Business School, Columbia University, New York, NY, USA*
[c] *The National Center for Priority Setting in Health Care, Department of Health, Medicine and Caring Sciences (HMV), 581 83 Linköping, Sweden*

ABSTRACT

Inaccurate beliefs about procedural fairness often motivate people to act in self-serving and selfish manners. We investigate whether information about a level playing field might mitigate such behaviors. In a pre-registered behavioral experiment ($n = 444$), using a competitive and real-effort task, we manipulate whether participants are informed about the fairness of a competition or not. Following the competition, participants (who either won or lost the competition) decided how to distribute earnings between themselves and their opponent. We show that informing participants about the fairness of the competition reduces selfish behavior among losers, while behavior among winners remains unaffected. Moreover, we show that losers who were not informed about the fairness of the competition incorrectly viewed it as having been unfairly stacked against them (i.e., believing that they encountered significantly more difficult tasks than their opponents). Our findings suggest that information about a level playing field reduces selfish behavior and is important for understanding when and why motivated reasoning about procedural fairness helps people uphold a positive self-image.

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1. Introduction

Winners rarely complain about referees. Losers, however, frequently lament how referees' poor decisions explain (and often exculpate) their lack of success. Nowhere is this more true than among academic researchers, who often complain about incompetent reviewers for failing to see the merit of their excellent papers when these get rejected, yet rarely give the editorial team a second thought when getting a paper accepted for publication. Similar examples can be found at the workplace, where potential candidates quickly find faults with recruitment processes when failing to secure a job, or when being passed over for a promotion. More generally, people often view the world not as it is but *as they want it to be*—a tendency that is especially robust under conditions of ambiguity or uncertainty (Dunning et al., 1989). People are often motivated to see themselves in a positive light, leading them to make external attributions for their failures (e.g., an unlevel playing field, bad luck, etc.), but internal attribution for their personal success (e.g., inherent ability or skill; Frank, 2016;

Kelley and Michela, 1980; Zuckerman, 1979). Yet, because people's ability to form positively-biased self-perceptions is constrained by the availability of evidence to support such rosy self-views (Pyszczynski and Greenberg, 1987), they often search for and attend to information in a manner that bolsters such beliefs. As a consequence, people tend to exhibit better memory for the obstacles and disadvantages they have overcome than the advantages and privileges from which they have benefited (Davidai and Gilovich, 2016). In competitive contexts, this may lead people to believe that they have unfairly faced bigger obstacles than their competitors.

Despite their potential for mitigating unpleasant feelings of failure and preserving a generally positive self-image, inaccurate beliefs about one's advantages and disadvantages may have detrimental consequences for behavior and society. For instance, viewing one's lack of success as caused by an unfair process may lead people to reject the competition's outcomes, question its validity, and feel entitled to greater benefits than they've received. Consequently, when people lack objective information about the procedural fairness, their subjective beliefs about whether their outcomes have been determined by a fair process may lead them to act in selfish manners that could potentially "level the playing field". Indeed, an analysis of data from the World Value Survey (Inglehart et al., 2014) shows that beliefs about procedural unfairness increase interpersonal hostility and unethical behavior (see Figure S1 and S2 in Supplementary Material). For instance, people who view success in life as largely due to unequal opportunities such as luck and connections are more accepting of unethical financial behaviors, theft, and false financial claims than people who view success as due to hard work and effort. Thus, correlational data suggest a relationship between people's willingness to engage in unethical, selfish behavior, and their beliefs about procedural fairness.

In this study, we explore whether beliefs about procedural fairness[1] *causally* influence selfish behavior in a competitive environment. Specifically, we test if informing people about a level playing field in a competition reduces their willingness to engage in selfish behavior. To do so, we conducted an experiment in which participants compete in dyads in a real effort task and are given the opportunity, at the end of the competition, to act selfishly. Specifically, after learning whether they won or lost the competition, we randomly assigned participants to either receive information that both competitors competed on a level playing field (i.e., that both they and their opponent had to complete an equal number of easy and difficult tasks) or to not receive any information about the level playing field. Following, participants decided how to distribute earnings between themselves and their opponent. The results of our experiment reveal that providing information about a level playing field reduces selfish behavior among losers (Hypothesis 1), but has no effect on winners' distributive choices. Participants who were left to rely on their own subjective beliefs about whether the competition was fair or unfair are more likely to believe that the competition had been unfairly stacked against them, a tendency that is especially true for losers of the competition (Hypothesis 2). However, we find no support for the hypothesis that losers' beliefs about procedural fairness correlate with their selfish behavior (Hypothesis 3).

We are not the first to explore the effect of self-serving biases on selfish behavior. Although people often act fair when they have sufficient information to decide between "right" and "wrong" (Camerer, 2011; Charness and Rabin, 2002; Engel, 2011; Fehr and Schmidt, 1999), they also tend to exploit uncertainties in decision-making environments as "moral wiggle room" for behaving selfishly (for a review see, Dana et al., 2012). Specifically, uncertainty about the *consequences* of one's actions has been shown to be instrumental in motivating selfish behavior. For example, people often rationalize their egoistic and unethical behavior by avoiding information about the possible consequences of their actions (Dana et al., 2007) and by interpreting risk (Exley, 2016) and vague information (Haisley and Weber, 2010) about these consequences in a self-serving manner. Thus, people appear to derive utility from viewing themselves as fair-minded, a goal they accomplish by constructing self-serving judgements about the consequences of their actions (see e.g. Gino et al., 2016; Dana et al., 2012).

Our study adds to this literature by exploring how uncertainty about *procedures* affects selfish behavior. In particular, we examine how information about a level playing field can be used to effectively decrease self-serving and selfish behavior. Process-related fairness plays an important role in selfish and fairness behavior (Akbaş et al., 2019; Bolton et al., 2005; Cappelen et al., 2007; Eisenkopf et al., 2013; Konow, 2000; Tinghög et al., 2017) and when institutions violate procedural-fairness norms, people engage in more unethical behavior such as cheating (Gill et al., 2013; John et al., 2014), lying (Banerjee et al., 2018), theft (Greenberg, 1990), sabotage and destruction (Fehr, 2018; Grosch and Rau, 2020). Yet, whereas the aforementioned studies have studied how *actual* procedural fairness affects selfish behavior, we study how *beliefs* about procedural fairness influences selfish behavior.[2] Thus, we examine whether informing people about a level playing field reduces selfish behavior.

1.1. Hypotheses

According to attribution theory and the literature on the self-serving bias, people are motivated to maintain a positive self-image. This desire frequently leads people to blame their personal failures on external circumstances (such as inequalities in opportunity) but attribute their successes to internal factors such as skill and inherent ability (e.g. Kelley and

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[1] We here adhere to a broad definition of procedural fairness - i.e., as the idea that people should be able to compete on equal terms, or on a level playing field.

[2] A related stream of literature has investigated how selfish behavior is affected when earnings are determined by luck compared to performance (e.g. Durante et al., 2014; Ku & Salomon, 2013; Lefgren, 2016). However, these studies do not consider the role of having disadvantages and advantages in competitions.
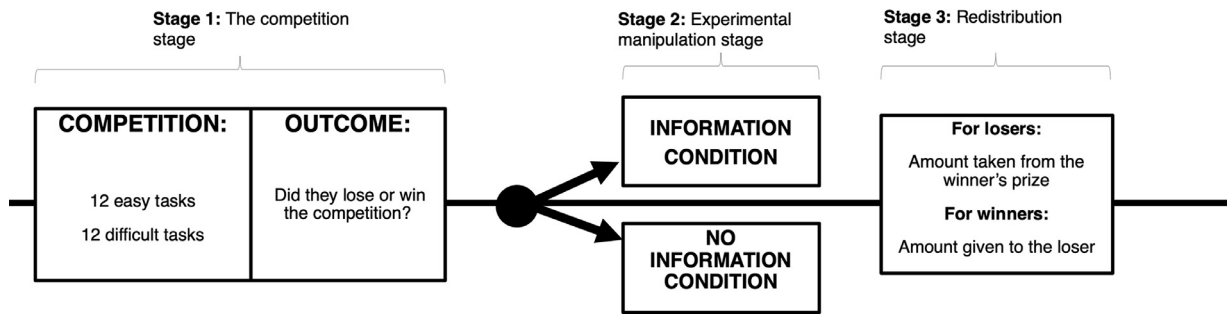
Fig. 1. Timeline of the experiment.

Michela, 1980; Miller and Ross, 1975; Zuckerman, 1979). Because people's ability to foster self-serving beliefs is constrained by the availability of evidence that supports such beliefs (Dunning et al., 1989), such self-serving attributions are more likely to occur under conditions of uncertainty. Thus, procedural uncertainty may leave people a moral wiggle room to form self-serving beliefs about the playing field which they can then use as an excuse for their selfish behavior. In this study, we test how beliefs about procedural fairness in a competition affect selfish behavior and whether informing people that both competitors competed on a level playing field decreases such behavior. We test this with the following three hypotheses:

Hypothesis 1: Losers of a competition who receive information that both competitors competed on a level playing field will be less selfish than losers of a competition who receive no such information.

Hypothesis 2: When no information about the level playing field is given, losers of a competition will be more prone than winners to believe that the competition was unfairly stacked against them.

Hypothesis 3: Beliefs about an unlevel playing field will be positively correlated with selfish behavior for losers of a competition.

2. Methods

Sample size was determined in advance and analyses were conducted only after data collection was complete. We report all conditions run and measures collected. The preregistration, materials, and data can all be accessed through the Open Science Framework: https://osf.io/w2jnk/. Informed consents were collected for all participants.

2.1. Participants and setting

Four hundred forty-four English-speaking participants were recruited from Prolific (Palan and Schitter, 2018) to participate in an interactive online experiment (49.8% males, 46.6% females, 3.6% other/prefer not to say, mean age = 35.2), which allows detection of small-sized effects ($d = 0.34$) with 80% power.[3] The experiment was programmed in LIONESS Lab (Giamattei et al., 2020) and Qualtrics. Prior the data collection, we recruited a different group of participants from the same subject pool to participate in a pilot study. This pilot study was designed to examine the study materials, guarantee the clarity of the instructions, and conduct a power analysis for the main experiment.[4] The experiment lasted for approximately 15 min and participants received a flat fee of 1.5 British pounds as well as additional compensation based on their performance (see below). As specified in the pre-registration, participants who did not complete the real effort task or scored below six points were excluded from the analysis. Due to technical problems, 13 participants completed only the competition stage, which resulted in a few missing observations for covariates collected at the end of the experiment.

2.2. Materials and procedure

Participants were randomly assigned to one of two conditions: The *information condition* or the *no-information condition*. Everything was identical across conditions except for the experimental manipulation in Stage 2, as described below. Fig. 1 illustrates the schematic flow of the experiment.

Stage 1: The competition stage

Participants were informed that they would be randomly matched with, and compete against, another participant in the study. To incentivize effort, participants were told that the participant with the most points would win the competition and receive higher earnings than the loser (in case of a tie, the participant who completed the tasks faster would be the winner). Participants were sequentially presented with 24 different tables (Abeler et al., 2011), each consisting of 105 randomly

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[3] We use Cohen's d to estimate effect sizes (calculated as the difference in mean value between the two treatment groups, divided by the pooled standard deviation) and refer to Cohens' classifications of effects sizes as small ($d = 0.2$) medium sized ($d = 0.5$), and a large ($d = 0.2$) (Cohen, 2013).

[4] The pilot study included only Stages 1 and 2 (no-information condition), see Fig. 1.

ordered 0's and 1's appearing in either blue or green. Based on the color of each table, participants were to take one of two actions: an easy action which required participants to click "OK" within the allotted time, or a relatively difficult action which required them to count and report the number of zeros in each table. Participants received a point if they were able to complete each of the two tasks within the allotted 30 s. Based on the design of previous studies (which find that people overestimate the number of difficult tasks they encounter; Davidai and Gilovich, 2016), all participants were presented with an equal number of easy (12) and difficult (12) tasks.

Stage 2: Experimental manipulation stage

After completing the 12 easy and 12 difficult tasks, participants learned whether they had won or lost the competition. They were further told that each task that appeared in blue for them (i.e., difficult task) appeared in green for their opponent (i.e., easy task) and vice-versa, such that the proportion of difficult tasks that they had to complete corresponded to the proportion of easy tasks that their opponents completed. In the *information condition*, participants were truthfully told that half of their and their opponent's tasks were easy tasks and half were difficult tasks (i.e., that both competitors competed on a level playing field). In the *no-information condition,* participants were not given any information about the number of difficult and easy tasks and were asked to estimate the proportion of tables that appeared in blue for them and their opponent.[5]

Stage 3: Redistribution stage

The winners of the competition received an additional 50 tokens (10 tokens = 1 British pound). To examine selfish and altruistic behavior, participants were then given the opportunity to redistribute these tokens between them and their opponent. Specifically, the losers of each competition were asked to decide how many tokens, on a scale from 0 to 20, they wanted to *take away* from the winner (i.e., selfish behavior). In contrast, the winners of each competition were asked to decide how many tokens, on a scale from 0 to 20, they wanted to *give away* to the losers (i.e., altruistic behavior). In each dyad, we randomly selected one of the two competitors' decisions to determine the final payment.

Individual difference measures

We collected three sets of individual difference measures: *the Cooperative/Competitive Strategy Scale* (CCSS; Tang, 1999), *the Benign Malicious Envy Scale* (BeMaS; Lange, 2014), and *the General and Personal Belief in a Just World* (BWJ; Dalbert, 1999).[6] The CCSS consists of 19 items which measure people's views on cooperation and competition as effective strategies for goal attainment (e.g., "To succeed, one must cooperate with others", "It is important to me to do better than others"; *1-Never, 7- Always*). The Benign and Malicious Envy Scale measures individual differences in people's motivation to better themselves versus pull superior others down (e.g., "If I notice that another person is better than me, I try to improve myself", "I wish that superior people lose their advantage"; *1-Strongly disagree, 6-Strongly agree*). The General and Personal Belief in a Just World Scale measures the belief that people in general, and that they themselves, are treated fairly (e.g., "I am confident that justice always prevails over injustice", "I believe that most things that happen to me are fair"; *1-Strongly disagree*, *6-Strongly agree*). As specified in the pre-registration, we investigate how the Benign Malicious Envy Scale and the Cooperative/Competitive Strategy Scale correlate with participants' redistribution decisions, and how General and Personal Beliefs in a Just World correlates with estimation of difficult tasks. Full description of all included measures is provided in Supplementary Material.

2.3. Statistical analysis

The main analysis plan was specified and pre-registered before data collection (see https://osf.io/vp24z). We code losers' selfish behavior on a scale from 0 to 20 (0 = do not take anything from the winner, 20 = take the maximum amount) and the winner's altruistic behavior on a similar scale from 0 to 20 (0 = give 0 tokens to the loser, 20 = give the maximum amount). We use estimation of difficult tasks as a measure of beliefs about the playing field in the competition. Participants indicated their estimate of how the difficult tasks were distributed between them and their opponent, and their answers had to add up to 100%. We coded their responses as the estimated percentage of difficult tasks (i.e., tables that appeared in blue) for the self on a scale from 0 to 100 (0 = no difficult tasks, 100 = all tasks were difficult).

Our main confirmatory analyses test our three hypotheses. First, to test if information about a level playing field reduces selfish behavior for losers (Hypothesis 1), we compare selfish behavior for losers across the two conditions, using two-sided t-tests. Second, to test if losers believe that the competition was more stacked against them compared to winners (Hypothesis 2), we compare estimation of difficult tasks between winners and losers who did not receive any information about the level playing field, using a two-sided *t*-test. We investigate the results' robustness by including background characteristics as control variables in a regression. Finally, to test if beliefs about an unlevel playing field are correlated with more selfish behavior for losers (Hypothesis 3), we run an OLS regression with losers who did not receive information about the level playing field, with selfish behavior as the dependent variable and estimation of difficult tasks as an independent variable.

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[5] Since the proportion of tables that appeared in blue (difficult task) for the participants was equal to the proportion of tables that appeared in green (easy task) for their opponents, participants were able to estimate the proportion of difficult tasks that each of them encountered. For example, if a participant estimated that 60% of their tasks were difficult (i.e., appeared in blue for them), then they could conclude that 40% of their opponent's tasks were difficult (i.e., appeared in blue for their opponent).

[6] The General and Personal Belief in a Just World Scale was elicited at the beginning of the study before the competition began. The Benign and Malicious Envy Scale and the Competitive Cooperative Scale were elicited at the end of the study, after the redistribution stage.
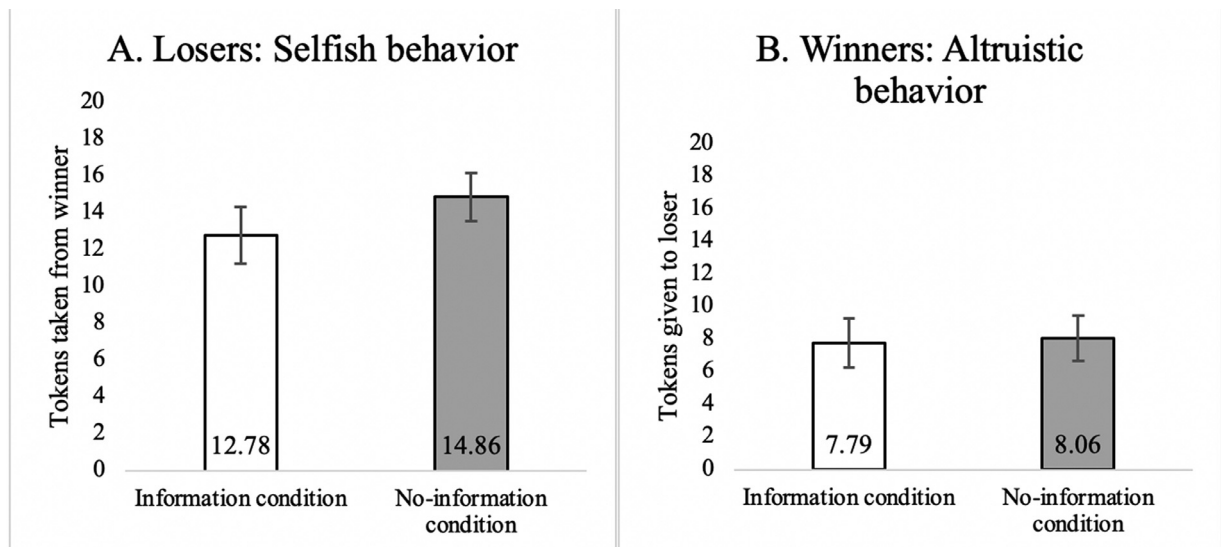
Fig. 2. 2A. Selfish behavior for losers of the competition, by condition. 2B Altruistic behavior for winners of the competition, by condition.
Note: Selfish behavior for losers ($n = 214$) is the amount taken from winners (0–20 tokens). Altruistic behavior for winners ($n = 222$) is the amount that winners' give to losers (0–20 tokens). Error bars show 95% confidence intervals.

For exploratory purposes, we also test Hypothesis 1 and Hypothesis 3 for winners, comparing altruistic behavior across the two conditions using a two-sided *t*-test (Hypothesis 1) and running an OLS regression with altruistic behavior as dependent variable and estimation of difficult tasks as an independent variable (Hypothesis 3).

3. Results

3.1. The effect of information about a level playing field on losers' and winners' redistribution decisions

We begin by examining how information about a level playing field affects selfish behavior for losers (see Fig. 2A). As predicted (Hypothesis 1), participants who lost the competition in the *information condition* took significantly fewer tokens from their opponents ($M = 12.78$, SD= 7.90) than participants who lost the competition in the *no-information condition* ($M = 14.86$, SD=6.85), $t(212)= 2.06$, $p = 0.04$, $d = 0.28$. Thus, relative to participants who were given explicit information about the fairness of the competition, participants who lost the competition and formed their own subjective beliefs about it took 15% more tokens from their opponents. In contrast, we find no difference across conditions in altruistic behavior for winners (see Fig. 2B). Whereas selfish behavior among losers is significantly influenced by whether or not they received explicit information about the level playing field in the competition, participants who won the competition gave their opponents an equal number of tokens regardless of the availability of such information ($M_{information-condition} = 7.79$, SD=7.82; $M_{no-information-condition} = 8.06$, SD=7.62; $t(220) = -0.27$, $p = 0.79$, $d = 0.04$). Furthermore, a series of regression analyses, controlling for participants' score in the competition, age and gender, and responses on the Cooperative/Competitive Strategy Scale and the Benign and Malicious Envy Scale, show that these results are robust (see Table 1).[7] Above and beyond any individual differences, participants who lost the competition and received information about the level playing field are substantially less prone to engage in selfish behavior.

To further explore how information about a level playing field affects selfish behavior, we conducted an additional exploratory analysis in which we classified participants as either high-performing or low-performing based on their competition score. We coded losers of the competition who scored below the median score (i.e., 19) as "low performing losers", and losers who scored above the median score as "high performing losers." This analysis revealed a very large between-condition difference in selfish behavior among high-performing losers, who lost the competition despite performing really well. High-performing losers who were explicitly told that the competition was fair took significantly less tokens from their opponents ($M = 12.46$, SD = 7.62) than high-performing losers in the *no-information condition*, who had to form their own subjective beliefs about whether or not they competed on a level playing field ($M = 15.69$, SD = 6.33), $t(118) = 2.53$, $p = 0.01$, $d = 0.41$. In contrast, there was no difference in selfish behavior between low-performing participants who lost the competition and were either given ($M = 13.20$, SD = 8.31) or not given ($M = 13.81$, SD = 7.38) information about the level playing field, $t(92) = 0.38$, $p = 0.70$, $d = 0.078$. Thus, although merely suggestive, this indicates that losing a competition after performing especially well increases participants' concerns about fairness and, subsequently, their tendency to engage

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[7] An additional regression analysis with a Tobit model confirms these results (Table S1 in Supplementary Material).

Table 1
The effect information about a level playing field on redistribution decisions.

	(1) Losers: take	(2) Losers: take	(3) Losers: take	(4) Winners: give	(5) Winners: give	(6) Winners: give
Information condition	−2.081**	−2.273**	−2.317**	−0.276	0.279	0.115
	(1.009)	(0.997)	(1.006)	(1.037)	(0.996)	(1.008)
Competition score		−0.122	−0.107		−0.150	−0.142
		(0.141)	(0.143)		(0.226)	(0.228)
Male		1.060	0.989		−0.697	−0.722
		(1.057)	(1.065)		(0.992)	(0.995)
Age		−0.003	−0.002		0.083**	0.085**
		(0.041)	(0.042)		(0.041)	(0.040)
Cooperative Scale		−0.229	−0.218		1.997***	1.862***
		(0.692)	(0.703)		(0.521)	(0.546)
Competitive Scale		−0.121	−0.217		−2.444***	−2.440***
		(0.642)	(0.670)		(0.673)	(0.726)
Benign Envy Scale		1.674**	1.676**		1.219	1.236
		(0.823)	(0.832)		(0.776)	(0.795)
Malicious Envy Scale		0.842	0.822		−0.670	−0.626
		(0.647)	(0.643)		(0.662)	(0.669)
General belief in a Just World Scale			0.681			−0.553
			(0.753)			(0.821)
Personal Belief in a Just World Scale			−0.426			0.929
			(0.774)			(0.796)
Observations	214	211	211	222	220	220
R-squared	0.020	0.099	0.102	0.000	0.149	0.155

Note: All regressions are ordinary least squares. The dependent variable in Model 1, 2, and 3 is selfish behavior among losers of the competition (0=do not take anything from the winner, 20=take the maximum amount from the winner). The dependent variable in Model 4, 5 and 6 is altruistic behavior among winners (0= give 0 tokens to the loser, 20= give the maximum amount of 20 tokens to the loser). Cooperative Scale and Competitive Scale are measures of attitudes toward success strategies, where a high score indicates a positive attitude towards cooperative/competitive success strategy. Benign Envy Scale (the motivation to improve oneself) and Malicious Envy Scale (the motivation to pull others down) is a measure of how people react to envy, where a high score indicates a propensity to react with Benign and Malicious Envy, respectively. The General Belief in a Just World measures people's tendency to believe that *other people* are usually treated fairly, and Personal Belief in a Just World measures people's tendency to believe that *they themselves* are treated fairly. Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

in selfish behavior. Put differently, information about a level playing field may be especially important for reducing selfish behavior when people narrowly lose a competition.

3.2. Why do losers become less selfish (but winners not more altruistic) when given information about a level playing field?

We predicted that, absent any explicit information about the level playing field, losing a competition would lead participants to view it as having been skewed against them (Hypothesis 2). This was indeed the case. As shown in Fig. 3, participants in the *no-information condition* who lost the competition estimated that they had encountered a significantly higher proportion of difficult tasks ($M = 54.4\%$, SD $= 10.62$), and that their opponent had encountered a significantly lower proportion of difficult tasks ($M = 45.6\%$, SD $= 10.62$), than was actually the case (as compared to 50%), $t(109) = 4.33$, $p < 0.001$. In contrast, although participants who won the competition in this condition also believed that they had encountered more difficult tasks than their opponents ($M_{self} = 51.7\%$, SD $= 9.25$; $M_{opponent} = 48.3\%$, SD $= 9.25$), their mean estimate is only marginally significantly different from the true value of 50% difficult tasks, $t(115) = 1.95$, $p = 0.054$. Overall, participants who lost the competition believed that they had encountered a significantly higher proportion of difficult task than participants who won the competition, $t(224) = −2.05$, $p = 0.04$, $d = 0.27$.[8]

Table 2 shows the effect of losing the competition on participants' estimation of the proportion of difficult tasks they faced while controlling for their score in the competition, age, gender, and beliefs in a just world. Interestingly, the General Belief in a Just World and the Personal Belief in a Just World had significant yet opposing effects on participants' beliefs about the number of difficult tasks they encountered. Whereas participants who more strongly believed that *they themselves* usually get what they deserve thought that they faced fewer difficult tasks in the competition, participants who more strongly believed that *other people (but not themselves)* usually get what they deserve thought that they had faced substantially more difficult tasks. Nevertheless, the effect of losing the competition on participants' beliefs about the number of difficult tasks they had faced was significant above and beyond any influence of the belief in a just world. Moreover,

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[8] We found similar results in the pilot study (n = 95), where participants completed an identical task but indicated their estimations on slightly different measures. When pooling the data from the main study with the data from the pilot study, we found that participants who lost the competition estimated that they had encountered significantly a significantly higher proportion of difficult tasks (M = 54.9, SD = 9.88), compared to participants who won the competition (M = 51.5, SD = 9.88), t(319)=2.96, p = 0.003.
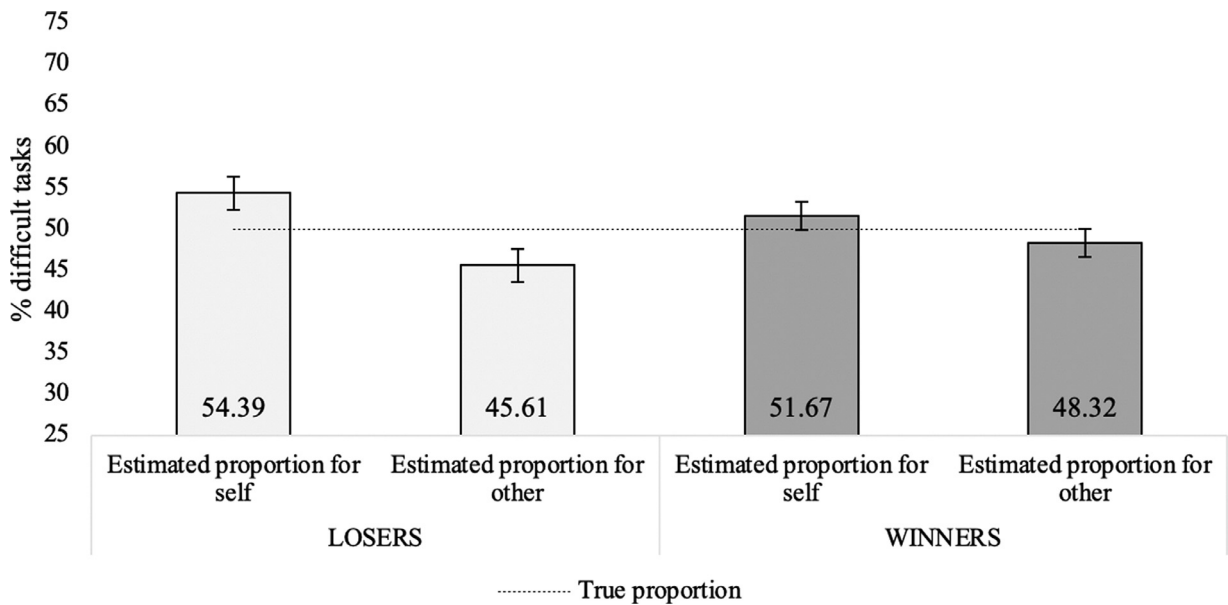
Fig. 3. Estimated proportion of difficult tasks by winners and losers in the no-information treatment. Error bars show 95% confidence intervals.

the effect of losing on estimation of difficult tasks was similar and statistically significant even when we control for compositional differences between winners and losers by matching participants based on their competition score (Table S2 in Supplementary Material).

To further explore how losing affected participants' estimation of difficult tasks, we conducted an additional exploratory analysis where we classified participants who lost as either high-performing or low-performing based on their competition score (see Section 3.1). This analysis revealed similar levels of estimation of difficult tasks among high-performing losers (M_{self} = 54.8%, SD = 9.41), and low performing losers (M_{self} = 53.9%, SD = 12.04), $t(108)$ = −0.45, p = 0.65, d = 0.09, suggesting that participants' score in the competition was not associated with their estimation of difficult tasks.

Finally, we examine whether participants' estimation of the proportion of difficult tasks was positively correlated with their tendency to act selfishly for losers (Hypothesis 3). Table 3 presents the regression results on selfish behavior among losers of the competition controlling for the proportion of difficult tasks and participants' score, age, gender, and the measures for individual differences Surprisingly, losers' beliefs about how much the competition was stacked against them (as indicated by estimated proportion of difficult tasks) was not related to their tendency to engage in selfish behavior, (β = 0.06, $t(107)$ = 1.12, p = 0.26). In contrast, the relationship between winners' altruistic behavior and their estimation of difficult tasks was negative and marginally significant (β = −0.14, $t(113)$ =−1.82, p = 0.07). Thus, participants' estimation of the number of difficult tasks they encountered did not seem to be robustly associated with more selfish behavior for losers, nor with less altruistic behavior for winners.

4. Discussion

Why is aggressive, hostile, and selfish behavior so rampant in competitive settings? Using a novel experimental paradigm, we found that the absence of explicit information about a level playing field increases people's tendency to engage in selfish behavior. Whereas participants who formed their own subjective beliefs about the fairness of a competition more frequently engaged in self-serving and selfish behavior, providing explicit information about the level playing field reduced such behavior. However, while this information reduced selfish behavior among losing participants, it did not affect behavior among winners of the competition. Losers who formed their own subjective beliefs of the playing field believed that the competition was unequally stacked against them. In contrast to losers who were informed about that both participants competed under the same sets of rules, they were more willing to engage in selfish behavior following the competition.

Our results suggest that information about a level playing field can reduce the "moral wiggle room" which people use to justify selfish behavior.[9] Just as people are more prone to engage in selfish behavior when the *consequences* of their actions are sufficiently vague and uncertain, (e.g., Dana et al., 2007; Exley, 2016; Haisley and Weber, 2010), we find that the absence

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[9] A further indication that the reduced selfish behavior for losers in the information condition is driven by increased beliefs about inequalities in opportunities is that losers of the competition overestimate the proportion of difficult tasks. Additionally, losers in the no information condition to a higher extent believed that factors outside the individual's control were decisive for the outcome of the competition compared to losers in the information condition (see Table S4 in Supplementary Material).

Table 2
Estimated proportion of difficult tasks in the no-information condition.

	(1) Proportion of difficult tasks	(2) Proportion of difficult tasks	(3) Proportion of difficult tasks
Loser	2.718**	3.792**	3.415**
	(1.328)	(1.464)	(1.553)
Competition score		0.297	0.228
		(0.274)	(0.282)
Male		−0.619	−0.454
		(1.299)	(1.360)
Age		0.046	0.040
		(0.047)	(0.050)
Cooperative Scale			−2.089**
			(0.925)
Competitive Scale			0.993
			(0.819)
Benign Envy Scale			−0.690
			(1.019)
Malicious Envy Scale			−0.705
			(0.844)
General Belief in a Just World Scale		2.945***	2.607**
		(1.006)	(1.025)
Personal Belief in a Just World Scale		−3.445***	−3.216***
		(0.884)	(0.963)
Observations	226	225	220
R-squared	0.018	0.076	0.110

Note: All regressions are ordinary least square. Only participants in the no-information condition are included in this analysis. The dependent variable is participants' estimated proportion of how many difficult tasks they had encountered. Loser is a dummy where 1= loser and 0=winner. Cooperative Scale and Competitive Scale are measures of attitudes toward success strategies, where a high score indicates a positive attitude towards cooperative/competitive success strategy. Benign Envy Scale (the motivation to improve oneself) and Malicious Envy Scale (the motivation to pull others down) is a measure of how people react to envy, where a high score indicates a propensity to react with Benign and Malicious Envy, respectively. The General Belief in a Just World measures people's tendency to believe that *other people* are usually treated fairly, and Personal Belief in a Just World measures people's tendency to believe that *they themselves* are treated fairly. Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

of explicit information about the *procedure* of a competition may have similar effects on selfish behavior, and especially so among those who end up losing.

How well people perform in competitive settings is the product of numerous factors, many of which are beyond people's control. For instance, whether people perform well or poorly in a competition is determined by their inherent ability or skill, by the amount of effort they devote to the competition, by their opponents' abilities and skills, by the amount of effort devoted by each of their opponent, by external factors that advance or hinder their and their opponents' performance, and so forth. People typically focus on only a subset of such factors when thinking about their and others' performance (Davidai and Gilovich, 2015). Yet, the myriad of elements that influence performance provide people with sufficient flexibility to feel as if their relative inferiority is due to factors outside their control rather than personal inadequacy. Consequently, by forcing people to take responsibility for their performance and learn from their failures, informing people about a level playing field may have other positive effects beyond reducing selfish behavior.

Our results are consistent with findings from previous studies showing that losing a competition increases the demand for redistribution, even when people make choices for two other participants (i.e. absent any selfish motives) (Cassar and Klein, 2019; Deffains et al., 2016; Espinosa et al., 2020). In line with the results from our study, Espinosa (2020) showed that when participants are informed that outcomes of a competition is determined by brute luck — i.e., whether one was randomly assigned to perform either a hard or an easy task — *before* the competition begins, winners and losers of the competition display similar redistributive preferences when making decisions for other people. We add to this literature by showing that the effect of informing people about a level playing field also decreases selfish behavior. Although previous studies have found that actual procedural unfairness that involves unequal opportunities increases unethical and selfish behavior (e.g., Banerjee et al., 2018; Fehr, 2018; Gill et al., 2013; Greenberg, 1990; Grosch and Rau, 2020; John et al., 2014), our findings highlight the immensely important role that *perceived* procedural fairness plays in zero-sum competitions, where resources are scarce, and several people compete for the same rewards.

Because disagreements regarding fairness may result in aggression, hostility, and conflict between successful and unsuccessful individuals, understanding when and why the outcomes of competitions are considered legitimate is extremely important. Simply put, leaving people "in the dark" regarding the playing field may undermine cooperation, trust, and legitimacy in society. Unfortunately, this dynamic is often seen in our own back yard, where wayward researchers tend to lose sight of the common goal of the scientific endeavor and instead engage in misconduct, fraud, and uncooperative behavior to promote their own selfish goals (e.g., John et al., 2012). We suggest that by bolstering people's beliefs about a level playing field, transparency can reduce such self-serving and often-destructive research practices. Whereas arranging fair procedures

Table 3

The correlation between the estimation of difficult tasks and redistribution decisions in the no-information condition.

	(1) Losers' selfish behavior	(2) Losers' selfish behavior	(3) Losers' selfish behavior	(4) Winners' selfish behavior	(5) Winners' selfish behavior	(6) Winners' selfish behavior
Estimated proportion of difficult tasks	0.059	0.075	0.076	−0.136*	−0.130	−0.132*
	(0.052)	(0.063)	(0.067)	(0.075)	(0.080)	(0.079)
Competition score		−0.088	−0.094		−0.299	−0.272
		(0.205)	(0.214)		(0.359)	(0.353)
Male		−0.378	−0.372		−2.321	−2.323
		(1.340)	(1.339)		(1.399)	(1.408)
Age		0.045	0.045		0.065	0.065
		(0.052)	(0.053)		(0.057)	(0.058)
Cooperative Scale		1.150	1.161		1.428	1.451
		(1.026)	(1.061)		(0.878)	(0.890)
Competitive Scale		0.115	0.179		−1.961*	−1.874*
		(0.766)	(0.808)		(1.029)	(1.066)
Benign Envy Scale		0.743	0.782		0.694	0.709
		(1.201)	(1.200)		(1.178)	(1.174)
Malicious Envy Scale		2.269**	2.233**		−1.358	−1.447
		(0.918)	(0.918)		(0.905)	(0.947)
General Belief in a Just World Scale			−0.252			−0.395
			(1.143)			(1.103)
Personal Belief in a Just World Scale			−0.091			−0.012
			(1.143)			(1.207)
Observations	109	107	107	115	113	113
R-squared	0.008	0.116	0.117	0.028	0.171	0.173

Note: All regressions are ordinary least square. Only participants in the no-information condition are included in this analysis. Model 1, 2 and 3 show the regression results for selfish behavior for losers, Model 4, 5 and 6 show regression results for altruistic behavior for winners. Losers' selfish behavior is amount taken by loser from the winner (0–20 tokens). Altruistic behavior for winners is amount winners give to the loser (0–20 tokens). Proportion of difficult tasks is participants' estimate of the proportion of difficult tasks that was presented to the participant self. Cooperative Scale and Competitive Scale are measures of attitudes toward success strategies, where a high score indicates a positive attitude towards cooperative/competitive success strategy. Benign Envy Scale (the motivation to improve oneself) and Malicious Envy Scale (the motivation to pull others down) is a measure of how people react to envy, where a high score indicates a propensity to react with Benign and Malicious Envy, respectively. The General Belief in a Just World measures people's tendency to believe that *other people* are usually treated fairly, and Personal Belief in a Just World measures people's tendency to believe that *they themselves* are treated fairly. Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

and practices is of upmost importance for creating a more just and ethical society, *informing* people about this procedural fairness is key.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jebo.2021.07.014.

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