Social Status and Prosocial Behavior*

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Abstract

This paper studies the effects of social status – a socially recognized ranking of individuals – on prosocial behavior. We use a laboratory experiment and propose a theory to address this issue. In a one-shot game, two players, whose social status is either earned or randomly assigned, jointly make effort contributions to a project. Player 1 first suggests an effort level for each player to player 2 who then determines the actual effort levels. Deviation from the proposal is costly. We find causal evidence that high-status players are less selfish than their low-status counterparts. In particular, high-status players 2 provide relatively more effort, ceteris paribus, than those with low status. The experimental results and theoretical framework suggest that a high social ranking yields more social behavior and that this can be attributed to the sense of responsibility that it gives. (***JEL:*** A14, C91, D63)

Key words: randomly generated status, earned status, prosocial, laboratory experiment

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"... rank among our equals, is, perhaps, the strongest of all our desires."

— Smith 1759

1 Introduction

Status is a ranking of individuals (or groups) in society based on their characteristics, actions, or assets (Weiss and Fershtman 1998). If the ranking is socially recognized, then it is a *social-status* ranking (Ball et al. 2001). Social status matters; most people do not like to be worse off than their peers. Indeed, social status has been argued to be "the most important incentive and motivating force of social behavior" aside from economic payoffs (Harsanyi 1966). At the same time, social preferences have been widely recognized as a fundamental force in human interaction (Cooper and Kagel 2016). There is by now abundant evidence that many people take into account the effects of their decisions on others.[1]

Though both social status and social preferences are deemed important determinants of human behavior, their interaction has rarely been studied. Those that do, sometimes take wealth or earnings as a proxy for social status. The conclusions vary. Some find "having less, giving more" (Côté et al., 2015; Dubois et al., 2015), while others find the opposite (more pro-sociality with higher status) amongst Dutch millionaires (Smeets et al., 2015) or Costa Rican CEOs (Fehr and List, 2004). Yet others observe no difference in generosity between the poor and the rich except that the rich give more simply because they have more money (Andreoni et al., 2017). This much variety amongst studies using the same proxy for social status makes the likelihood of a common conclusion even lower if one allows for other proxies like educational attainment. In the next section we will further discuss the lack of consensus about the relationship between social status and social preferences, and also venture reasons for the disagreement.

[1]Models with empirical support include an aversion to inequity (Fehr and Schmidt 1999; Bolton and Ockenfels 2000), concerns for efficiency, and maximin preferences (Charness and Rabin 2002; Engelmann and Strobel 2004).

Even less is known about the *causality* in this relationship or the underlying mechanisms. In fact, even if social status causally affects social preferences, it may well matter if this status is achieved by luck or merit, that is, whether it was acquired by chance or earned by hard work.[2] This is an important aspect that we will try to account for in this paper. Our goal is to fill these fundamental gaps in knowledge by studying the causal relationship between social status and social preferences, while taking into account the way in which status was acquired.

Examples from the field paint a mixed picture about the status-social preference relationship. On the one hand, lawyers and doctors, who are generally considered to have high social standing, are often involved in various pro-social activities. For example, more than 80% of the attorneys in the U.S. have provided pro bono services at some point in their professional life and 52% provided such services in 2016 (American Bar Association, 2018). As for doctors, Médecins Sans Frontières (Doctors Without Borders) provided medical support in over 70 countries in 2018 (Médecins Sans Frontières, 2018). On the other hand, financial professionals (who also tend to be considered of high social ranking) are often criticized for their greediness and dishonesty in economic downturns (Cohn et al., 2014). Of course, such examples are anecdotal. Behavioral choices by lawyers and doctors are driven by many factors other than social preferences alone (including, for example, reputation concerns and investments in one's career). Therefore, many questions remain.

We use a laboratory experiment and a theoretical model to address the interaction between social status and social preferences. In doing so, we will carefully define what we mean by 'social status' and 'social preferences'. The highly controlled environment in the laboratory and the theoretical model allow us to generate a status ranking among subjects and to avoid endogeneity issues by isolating the effects of ranks from endogenous variables such as income, education, power and natural causes such as gender and caste.

[2]Examples of a randomly assigned status are status based on being a member of a royal family, having a high IQ, being beautiful, or having a specific gender. Examples of an earned status are less clearly derived, because there is often an element of 'talent' involved (which may be randomly acquired). Nevertheless, think of status based on educational degrees, expertise, and income. An individual might, for example, show respect to someone who accumulates wealth from hard work, but may not do so to someone who inherits wealth from parents.

To mimic the two distinct status assignment processes described above we differentiate between three treatment conditions in the experiment: a Baseline without status (BL), a treatment where status is assigned randomly (which is common knowledge), called Random Status (RS), and a treatment where high status is earned (in a novel task), called Earned Status (ES). In short, the experimental design is as follows. Two players as a team jointly make effort contributions to a project. Players may have different social status (in RS or ES); think of a senior manager and a junior employee working together. Player 1 first suggests effort levels for both players to player 2, who then determines the actual effort for each player. If player 2 deviates from the proposal, she incurs a cost. We find that prosocial behavior is status specific; high-status players are willing to make more effort than their low-status counterparts and more effort than players where no status is induced. A random assignment of status suffices to find this effect.

We then propose a model to illustrate why high social status can induce prosocial behavior. On the one hand, players' evaluation about their value to the team may vary, depending on whether status is high or low and whether it is earned or randomly assigned. In the latter case, we expect differences between ES and RS. For example, a senior position may make a manager believe to be more valuable if she is hired for her leadership and managerial ability than if chance played a large role in her getting the position. On the other hand, self-evaluation is essential to both a player's efficiency and her payoff inequality concerns. Given these channels, we find that a high-status player cares more about inequality than players in any other scenario, and thus is more generous in making effort. In the experiment, we also use a survey, to elicit players' beliefs about their own ability. Consistent with the assumption in the model, the survey results show that subjects with a high-status estimate their own cleverness, ability, and entitlement higher than low-status individuals do.

Our findings have implications for the management of organizations. Differences in social status are salient in many parts of modern societies, such as hierarchies in the workplace, ranks in the military, politics, etc. If social preferences are affected by social status, then human resource departments may be able to fine-tune their promotion strategies to allow the organization to better benefit from individuals' pro-social behavior.

This paper aims to contribute to several strands of the literature. First of all, it adds new evidence to the "noblesse oblige" effect – privilege entails responsibility. Being endowed with high status makes one more prosocial. This makes sense from a social exchange point of view (Homans 1958; Blau 1964), because status – public recognition, admiration, and respect – may be seen as a gift, and a reciprocal person may act prosocially to complete a social exchange of favors. We also hope to contribute to the experimental economics literature on the effects of status, even when the status is symbolic.

Our work also relates to a strand of literature in management and political science that studies the effects of how leaders in organizations are elected. Whether a leader is elected or randomly (exogenously) selected makes a difference in cooperation level among villagers (Baldassarri and Grossman, 2011, 2013); influences the choice between an "autocratic" or "democratic" management style (Kocher et al., 2013); affects the legitimacy of the leaders and the choice of an efficient equilibrium (Brandts et al., 2015); and is related to the adoption of non-selfish policies (Drazen and Ozbay, 2019). Here leadership involves having a high status in a socially recognizable hierarchy.

The remainder of this paper is structured as follows. Section 2 reviews related studies that focus on the role of social status in social preferences. Section 3 presents the task, and section 4 describes the experimental design, discussing how status is manipulated and what the treatment groups are. Section 5 describes the main results. Section 6 introduces the model. Section 7 explores the mechanisms underlying the status effects we observe and section 8 concludes.

2 Literature Review

Over the past few decades, various correlational studies in economics and psychology have examined the relationship between social status and social preferences.[3] No consensus, however, has been reached on whether and how having a higher social status is associated with either selfish or non-selfish preferences. In some studies, children with a higher status in terms of their educational background (which school they attend, or the level of their parents' education) appear to be more altruistic and less selfish (Bauer et al. 2014), and are more generous in charitable giving (Liebe and Tutic 2010; Nettle et al. 2011; Silva and Mace 2014, 2015). Others find the opposite, that low-status individuals are more prosocial and helping (Amir et al. 2018) and are involved with fewer unethical decisions (Côté et al. 2015; Dubois et al. 2015). On the other hand, using large data sets, two recent studies by Gsottbauer et al. (2022) and Jung et al. (2023) find no evidence for the notion that individuals with higher social status are less ethical.

There are two reasons why these empirical findings may be so different. First of all, the definition of social status varies, as does the choice of variables used to differentiate between people with high and low status. For instance, the proxies used for high social status include income (Côté et al. 2015; Dubois et al. 2015), vehicle brands (Chen et al. 2017; Mujcic and Leibbrandt 2018), outfits (Ebeling et al. 2017), and family education (Bauer et al. 2014; Liebe and Tutic 2010); others have used weekly hours of work (Glaeser et al. 2000), hierarchy position within an organization (Zhang and Xie 2019), and gender, race, and religion (Hong and Bohnet 2007).

The second reason is that variables with naturally-occurring social status are endogenous, making it almost impossible to disentangle the effects of social ranking on social preferences from confounders. It has been recognized by both economists and psychologists that there are gender differences in altruism (Andreoni and Vesterlund 2001), inequity-aversion, and trust and reciprocity; see for a review Croson and Gneezy (2009). Age is also found to be positively related to the provision of public goods in the field (List 2004),

[3]For an overview of studies in economics and sociology that report correlations between preferences more generally and social status, see Weiss and Fershtman (1998).

and height is negatively related to altruism (Harbaugh et al. 2003). Also, income affects inequity-aversion (see a review in Heffetz and Frank 2010), and education is related to redistribution preferences (Fong 2001). If at the same time gender, age, height, income, or education determine one's status, then a correlation between social status and social preferences will be observed even if there is no causal relationship between the two.

Experimental studies have made a breakthrough possible, by allowing one to isolate the effects of social ranks on behavior from confounding factors. Instead of using naturally-occurring social status, exogenous social status is introduced. This methodology has clear advantages. Not only does it create a 'pure' effect of social ranking on preferences that is independent of income, education, and other confounding factors, but it also creates an agreement across individuals on what constitutes high status. For instance, a football player might enjoy a high status among a group of athletes but perhaps less so among economists. Such differences will occur much less frequently when status is induced in the laboratory.

In economics, Hoffman and Spitzer (1985) were the first to induce status differences in the laboratory. They compare the behavior of individuals who earned a high status (based on on winning a 'hash mark game') to those who were randomly appointed such (by a coin flip). Participants subsequently took part in an ultimatum game, where high-status players were given the role of proposer. The authors find that when status is based on skills, proposers are more willing to exploit their power by suggesting less equal splits.

Nevertheless, previous studies have not reached an agreement on the effect of a high status on prosocial behavior. In a carpooling arrangement (Fiddick and Cummins 2007), individuals who are primed with high status are more willing to tolerate free-riding; similarly, subjects who are primed with high status are more likely to tolerate cheating (Fiddick et al. 2013) such that greater generosity is exhibited toward low-status individuals. In contrast, Guinote et al. (2015) find that individuals with randomly appointed high social status are less willing to help someone in need and less likely to do volunteer work or provide a public service. In an analysis using a large Dutch population sample, Trautmann et al. (2013) conclude that the relationship between social status or class and ethical behavior is a “complex mosaic”.

A seminal paper by Ball et al. (2001) compares the behavior of subjects with high and low status in a market setting, differentiating between the situations when status that is randomly drawn from a basket and those where status is determined by a trivia quiz (Eckel and Ball 1996; Ball and Eckel 1998).[4] Their results show that subjects with high status end up with a larger share of the surplus than their low-status counterparts. However, random status has a stronger effect than earned status in their setting; the authors speculate on how this might have been affected by the experimental procedures in the earned status treatment.[5] Since its publication, the Ball et al. (2001) procedure used to assign earned status has been adopted in many studies. This has led to results showing that a high social status helps to achieve a Pareto superior outcome in a coordination game (Eckel and Wilson 2007), to induce social learning in public goods provision (Eckel et al. 2010), and to increase charitable giving in cooperative settings (Kumru and Vesterlund 2010). Our paper also builds on the Ball et al. (2001) social status inducement method.[6]

For our distinction between randomly determined and earned status, the literature on leadership appointment provides relevant input. This literature shows that “the way in which a leader is chosen per se may affect a leader’s behavior” (Drazen and Ozbay, 2019). Note that this has an endogeneity issue that is similar to our case; it might, for example, be the case that a potential leader’s behavior affects the likelihood of being appointed. Experimental studies have been used to overcome such problems. Brandts et al. (2006) apply a three-person distributive game and show that when the allocator is known to have been purposefully selected by a peer, she is more altruistic than if she is known to have been randomly selected. Kocher et al. (2013) observe that elected managers are more likely to choose a “democratic” management style compared to exogenously assigned managers. Brandts et al. (2015) find that elected leaders are better at improving a group’s aggregate

[4] The design uses mild deception; status in both treatments is in fact allocated randomly.

[5] Subjects are asked to answer questions that they are unfamiliar with, and may consider it unfair to base status on these. See footnote 14 in Ball et al. (2001).

[6] We, however, use no deception and make all procedures transparent to subjects.

outcome than randomly selected leaders. Finally, Drazen and Ozbay (2019) show that elected leaders are more likely to launch non-selfish policies than appointed leaders and that this non-selfish behavior of leaders reflects a reciprocal motive. Taken together, these studies suggest that earned leadership yields more social behavior than randomly determined leadership. Our study extends this to the more general case of social status.

3 The Task

The experimental task involves a constant aggregate level of effort that is needed to generate an income of 48 monetary units. Two players must decide how much effort each should contribute. We fix the total amount of effort at 10 units, with e_1 by player 1 and e_2 by player 2.

$$e_1 + e_2 = 10. \tag{1}$$

There are two stages. First, player 1 makes an effort proposal a to player 2. Then player 2 decides on her actual effort. With constant total effort, player 2 thus also determines player 1's effort. Effort is costly. For both players, the marginal cost of effort is 2 points. The payoff for player 1 is $\pi_1 = 24 - 2e_1$. If player 2 follows player 1's proposal ($e_2 = a$), then her payoff is $\pi_2 = 24 - 2e_2$. Without deviation from a, aggregate payoff is then constant and equal to 28.

Player 2 may deviate from the proposal. Deviation is costly; each unit deviation from the proposal gives rise to a 1 point decrease in player 2's payoff. Player 1's payoff remains unaffected by the deviation and is determined only by player 2's choice. In this way, deviation from the proposal yields an efficiency loss at the team level. In summary, the payoffs in this game are given by

$$\begin{aligned} \pi_1 &= 24 - 2e_1, \\ \pi_2 &= 24 - 2e_2 - P, \text{ where } P = |e_2 - a|. \end{aligned} \tag{2}$$

In the experiment, effort choices are restricted to the set of odd-numbered integers $\{1,\ 3,\ 5,\ 7,\ 9\}$. Table 1 summarizes the payoffs for both players under five proposal schemes, if no deviations occur. We also report two subgame perfect equilibria assuming, respectively, pure selfishness and pure inequity-aversion for player 2. Player 1's preferences are inconsequential because player 2 decides the final payoffs. If player 2 is purely selfish, she will always choose the minimum effort for herself because she is at least as well-off as when she follows the proposal. Ergo, a combination of any a together with $e_2 = 1$ constitutes a subgame perfect Nash equilibrium. A different equilibrium occurs when player 2 is purely inequity-averse. Suppose player 1 knows that player 2 cares about fairness and will minimize inequality by choosing $(5, 5)$. She will advise $a = 5$. The reason is that for any other proposal, player 2 will deviate towards the equitable outcome and player 1's payoff will be reduced (deviation is costly and player 2 will split the reduced aggregate payoff equally). Therefore, in equilibrium, $a = 5$, and $e_2 = 5$ for completely inequity averse players.

We believe this task is better suited to examine the effects of a high status on effort and efficiency than the commonly used dictator or ultimatum games. A dictator game eliminates all interaction between players while an ultimatum game has only extreme efficiency concerns (either the total pie is allocated or nothing). In contrast, the task introduced here creates an interaction between the two players and allows for various degrees of inefficiency. We believe that both elements are important characteristics of the type of team project we are interested in. Our task can be viewed as a two-stage dictator game with player 2 as the dictator in the second stage. The possible pie divisions are determined by player 1 by her proposal in stage 1.

4 Experimental Design

Before participating in the task described above, subjects privately read the experimental instructions (see online Appendix B). In some treatments, they were subsequently assigned status in the way described below.

Table 1: Payoffs if no Deviation

e_2 $(= a)$	$1^{\dagger}$	3	$5^{\S}$	7	9
π_1	6	10	14	18	22
π_2	22	18	14	10	6

Notes: † is the subgame perfect equilibrium assuming purely selfish player 2. § is the subgame perfect equilibrium assuming purely inequity-averse player 2.

We vary three treatments between subjects. In all treatments, subjects first review 10 pairs of paintings in a way to be explained below. In two treatments subjects are endowed with social status. Results from the painting task are revealed and a public ceremony awards the winners. In a control treatment where no status is available there is no such ceremony nor the revelation of painting task results. The procedure is common knowledge within each treatment. In the second part of the experiment, subjects are paired to conduct the team production task described above. In treatments with social status, all pairs consist of one high status person and one low status person. At the end of the experiment, we collect social and economic characteristics in a questionnaire. Subjects are also asked to answer questions to check their understanding of the instructions and the calculation of payoffs. For detailed information, please see online Appendices B and C.

4.1 Minimum Status Paradigm

In part one, subjects individually and independently review 10 pairs of paintings that are painted either by a child under 15 years old or by a professional adult painter.[7] Their task is to tell the source of each painting. There are four possibilities; both are painted by children, both are painted by professional adult painters, the painting on the left is painted by a child and the painting on the right is painted by a professional, and the painting on the left is painted by a professional and the painting on the right is painted

[7] Paintings by professional painters are obtained from MoMA's online gallery, which are freely available for research purposes. For the children's paintings, we are grateful to the "Global Children's Art Gallery" (naturalchild.org/gallery) for granting us permission to use these.

by a child. In Baseline (BL), subjects complete the painting task and directly go to the second part of the experiment. They are not informed about their performance in the painting task. In the other treatments, 'winners' are determined. The procedure used is common knowledge. In Random Status (RS) the winners are selected randomly by table number (half of the subjects in the session are declared the 'winners' based on their table numbers; answers in the painting task play no role); as a consequence, subjects know that winners are determined by luck and nothing else in RS. In Earned Status (ES) subjects receive one point for each correct answer (an answer is correct if both paintings in a pair are correctly assigned) and the the 50% of the subjects with most points are the winners. In case of ties, winners are determined randomly (In total, 132 people were 'losers' in the contest; 12 of these were tied with at least one other who was a 'winner'). Finally, to avoid income or wealth effects, this part is not financially incentivized.

The procedures of the award ceremony are standard and identical for RS and ES. Once the painting task has finished, subjects are seated in the reception room next to the laboratory. Then the experimenter publicly announces the winners' table numbers. To better recognize the winners, the experimenter attaches a star on winners' station IDs.[8] In addition, the experimenter gives a small gift to each winner. Finally, all subjects are asked to applaud the winners. Winners enjoy two privileges for the rest of the experiment: first, they will be seated at a 'VIP' area that is decorated with stars. Questions from the VIP seats will be answered first if a winner and a loser have questions at the same time. Second, winners will be the first to be paid at the end of the experiment.[9]

Using a high score on the painting task to determine the winners aims at generating a feeling of entitlement without selecting subjects on unobservables that might be correlated with social preferences such as wealth, education, and cognitive abilities. Bottorf (1946)

[8]The station ID is used in every experiment. It is part of the standard procedures at the laboratory to ensure complete anonymity. Upon arrival at the laboratory and before the experiment starts, each subject randomly draws a station ID to determine at which station she sits during the experiment. After subjects have finished the experiment, they receive their payments according to the station ID.

[9]The small gift is a pen from the university shop. The pens are common to students and staff. Sometimes, students get the pens for free at workshops, seminars, and conferences. We chose the pen as presents to avoid possible income effects. The price for a pen was 0.75 euro at the time we purchased them. For pictures of the VIP area, stars, and the pen, see online Appendix C.

shows that the ability to appreciate art is uncorrelated with IQ. A similar task in Zheng et al. (2021) shows that there is no correlation between the performance in the painting task and a number search and summation task.[10] We thus expect no differences between the two treatments in terms of relevant characteristics. In other words, we use the painting task is to induce a 'minimum status' (think of the role of the minimum-group paradigm when studying group identification). Subjects with high status should really perceive themselves superior to those with low status and in turn the latter should perceive themselves to be inferior. Our way to avoid a correlation with actual ability is thus by using a task where actual ability plays a minimal role while this role is perceived to be important. We measure participants' perception that performance in the task reflects ability in the post-experimental questionnaire and find support for this hypothesis (cf. section 7.2).

4.2 Treatments

In the team production task, each high status player is paired with a low status player. This gives rise to two possible situations in the treatments with status; either player 1 is high status and player 2 is low status or vice versa. The treatment groups are summarized in Table 2. Because there is no status in BL, players in BL are paired according to their station ID, which is used in RS to determine 'winners'.

Subjects all know that there is only one round in the task. After player 1 has given a proposal, player 2 chooses the actual effort. The answers of player 2 are elicited by the strategy method. That is, player 2 chooses the actual effort, respectively, for each possible proposal $a \in \{1, 3, 5, 7, 9\}$. Player 2 thus gives her choice for e_2 for each possible proposal by player 1. The final payoff is determined by the actual proposal a and actual effort level e_2, using equations (1) and (2).

The difference between BL and RS will shed light on whether even a minimal status differentiation has behavioral effects. Since it is made clear that winners in RS are selected completely randomly (by station ID), we expect no differences between RS and BL. The

[10] Zheng et al. (2021) show an insignificant negative correlation (-0.04, with 208 observations) between scores in the two tasks.

Table 2: Overview of Treatment Groups

	Player 1	Player 2	N
Baseline (BL)	–	–	204
Random Status (RS)	High	Low	132
	Low	High	132
Earned Status (ES)	High	Low	132
	Low	High	132

Notes: Due a programming error, three players 1 with low status in the Netherlands were asked to make a decision as player 2 instead. We have included these observations in our analyses. Nothing changes if we drop them.

distinction between RS and ES aims at providing insights in the effects of earning a high status.[11]

4.3 Hypotheses

This subsection develops hypotheses about status and prosocial behavior. In particular, we are interested in actions that players 2 might take and whether or not earned high status gives rise to more prosocial behavior than randomly-obtained status.

First, we hypothesize the 'noblesse oblige' effect for players with high status in our experiments. In short this predicts that those with high status provide more effort than those without or with low status. If we assume that RS induces a 'minimum status' difference, this gives (cf. Table 2 for treatment acronyms):

Hypothesis 1

1.I. Mean effort by players 2 is higher for high-status participants in RS than for (1) players in the benchmark; (2) low-status players in RS.

Our design, of course, aims to induce the strongest status differences in ES. This gives:

Hypothesis 2

[11] One should keep in mind, of course, that we implement a binary status measure (high or low status) and a two-player laboratory game (though the binary ranking involves all 20 or 24 participants in a session). Whether our results would extend to multi-player games and a more refined status ranking is an open question for future research. We thank an anonymous reviewer for pointing this out.

2.I. Mean effort by players 2 is higher for high-status participants in ES than for (1) players in the benchmark; (2) low-status players in ES; (3) high-status players in RS.

2.II. Mean effort by players 2 is lower for low-status participants in ES than for (1) players in the benchmark; (2) low-status players in RS.

The mechanism underlying the differences we expect in player 2 effort choices might be related to distinct proposals by players 1, but we have no specific hypothesis on this. The 'noblesse oblige' effect does predict that players 2 will exhibit stronger social preferences when they have high status. One measure for these social preferences is the average effort with which a player 2 responds to the distinct proposals player 1 might make (we discuss alternative measures when presenting our results). This yields:

Hypothesis 3

3.I. The average effort response by players 2 to possible proposals is higher for high-status participants in RS than for (1) players in the benchmark; (2) low-status players in RS.

3.II. The average effort response by players 2 to possible proposals is higher for high-status participants in ES than for (1) players in the benchmark; (2) low-status players in ES; (3) high-status players in RS.

5 Results

5.1 Descriptive Statistics

A total of 732 subjects participated in this experiment, 300 in the Netherlands (15 sessions with 20 participants each) and 432 in China (18 sessions with 24 participants each).[12] In the Netherlands (China) we had 3 (6) sessions in BL, and 6 (6) each in RS and ES. On

[12] In an original submission to this journal, we only had the 300 subjects in the Netherlands. A reviewer suggested that we run more sessions. For logistical reasons, we had to organize these in China. We pool the data from both countries and correct for possible subject pool effects in our analyses below. Based on subjects' choices in the Netherlands, a power of 80% would require approximately 35-45 participants per cell in Table 2, which we now achieve.

average, each session lasted 45 minutes and the average payment was 14.13 euro per person in the Netherlands including a 7 euro show-up fee, and 41.02 Yuan in China, including a 15 Yuan show-up fee.[13]

When testing for the randomization of subjects across treatments, no statistically significant differences in observable characteristics appear between RS and ES.[14] There are, however, some differences between each of these two treatments and BL. It appears that participants in BL are significantly older in BL than in RS (Fisher-Pitman permutation t-test, henceforth FPP, 21.6 vs. 21.1, $p = 0.049$, $N = 468$) and there are significantly fewer women in BL than in RS (FPP, 0.45 vs. 0.55, $p = 0.044$, $N = 468$) and ES (FPP, 0.45 vs. 0.61, $p = 0.002$, $N = 468$). We control for such differences in the regression analysis below. There are no other significant differences in observable characteristics in any pairwise comparison between treatments.

5.2 Treatment Effects

5.2.1 Effort Choices

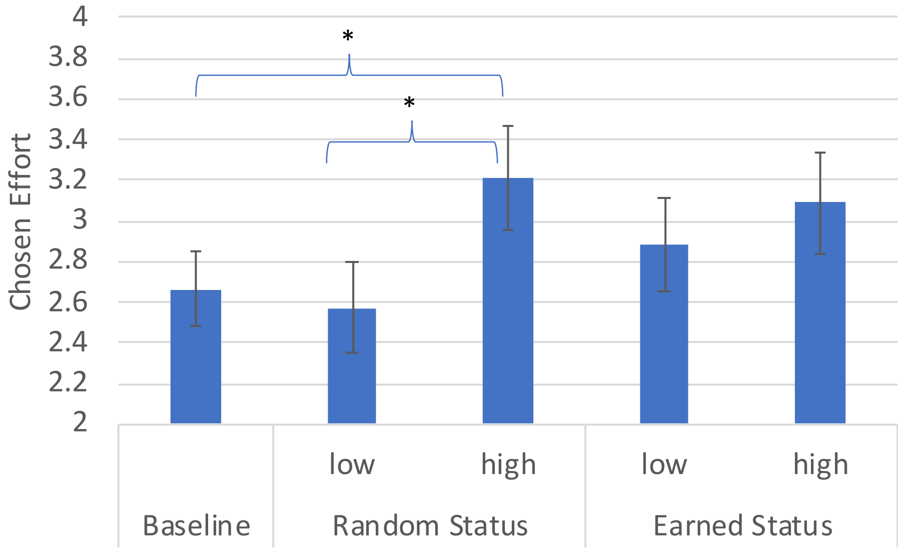
Recall that players 2 may be in one of five possible positions (cf. Table 2); they may be without status (in BL) and they be of either low or high status in either RS or ES. Figure 1 shows the chosen effort levels for each of these player types.

We observe that participants with high induced status tend to choose higher effort for themselves, that is, they show stronger other-regarding preferences. Using pairwise comparisons, the differences between on the one hand high random status and on the other the baseline (FPP, 3.2 vs. 2.7, $p = 0.095$, $N = 168$) or low-random status (FPP, 3.2 vs. 2.6, $p = 0.083$, $N = 132$) are (marginally) significant. This provides support for Hypothesis 1.I. All other pairwise differences are statistically insignificant (FPP, all $p > 0.15$, all $N \geq 132$). We can therefore not reject a null of no effect in favor of Hypothesis 2.I or 2.II. It appears that at this aggregate level, the distinction between high and low

[13] At the time of the experiment, the exchange rate was approximately 1 euro = 7.69 Yuan.

[14] See more details in online Appendix D; there a table describes some descriptive statistics of the subjects in the experiment and tests for pairwise differences across treatments.

Figure 1: Effort Chosen by Players 2



Notes: Bars show the final effort chosen by players 2. To highlight differences, the vertical axis starts at effort level 2. "Status" refers to own (player 2) status. Error bars show 95% confidence intervals.

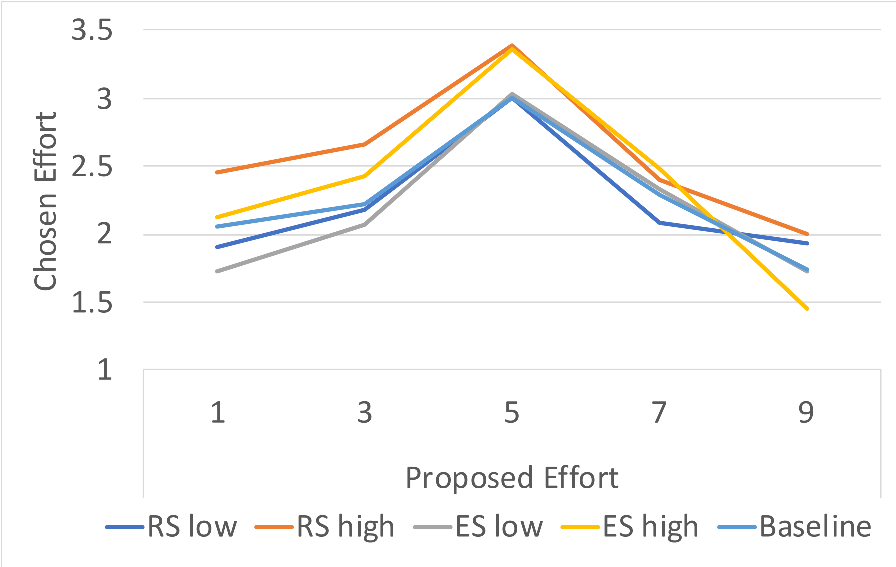
status is more important than the difference between random and earned status. If we pool the two low-status groups on the one hand and the two high-status groups on the other, we find that the chosen effort is (marginally) higher amongst those with high status than in the benchmark (FPP, 3.2 vs. 2.6, $p = 0.074$, $N = 234$) and those with low status (FPP, 3.2 vs. 2.7, $p = 0.090$, $N = 267$).[15]

The reason for the differences caused by status may be related to player 2's preferences varying with status, but they could also be a consequence of players 1 of different types making distinct proposals.[16] We first consider player 2's preferences. Figure 2 shows the chosen effort levels for each of the player types in response to each possible proposal by player 1. First note that the response curves for the two groups with high status exhibit higher effort (less selfish behavior) than for the other groups, unless the proposal is for the high-status players 2 to make more effort than player 1 (that is, proposals 7 and 9). Most

[15] Note that the tests so far do not correct for country or other possibly confounding variables. We will do so in regression analyses, below, where we show that this increases the statistical significance of the differences observed here.

[16] Recall that a player 2 of high (low) status is always paired with a player 1 of low (high) status.

Figure 2: Conditional Effort Chosen by Players 2



Notes: Lines show the effort chosen by players 2 conditional on the five possible proposal levels. "Status" refers to own (player 2) status. The y-axis starts at the minimum effort level of 1.

curves are more or less symmetric around a proposal of equal effort (5), but the high-status participants respond with higher effort to this 'fair' proposal. One way to test for response differences across types is by calculating per player 2 the average response across the five possible proposals. At this aggregate level, this shows no significant differences (FPP, all $p > 0.10$, all $N \geq 132$).[17] Hence, we find no support for Hypothesis 3.I or 3.II.

As an alternative measure of social preferences, we first investigated whether the response to a proposal to provide equal effort of five differs across types. In spite of the differences that appear to exist in Figure 2, we observe no significant differences (FPP, all $p > 0.24$, all $N \geq 132$). Because the mean across individuals may hide differences in heterogeneity, we also check whether the fraction of selfish participants varies across types. In an earlier version of this paper, we reported that in the Netherlands there were marginally significantly fewer selfish players with high earned status than in the baseline. We do not replicate this finding with the new data set. The fraction of selfish players

[17]Alternatively, we could use Kolmogorov-Smirnov tests to compare the distributions response curves in Figure 2. This also shows no significant differences across groups (all $p > 0.35$).

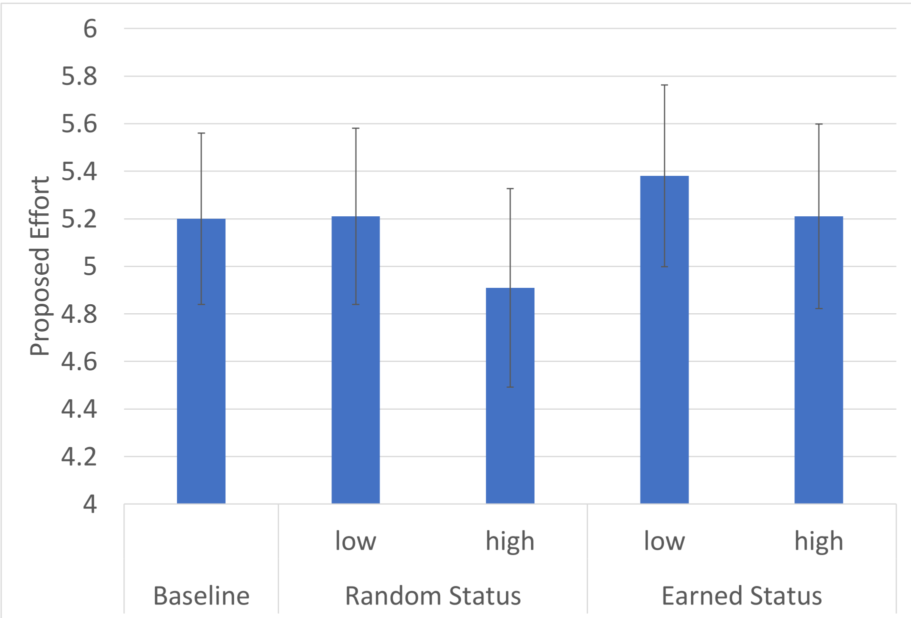
varies between 0.33 for high-random-status types and 0.45 for low-random-status types. None of the pairwise differences is statistically significant (FPP, all $p > 0.20$, all $N \geq 132$).

We conclude that at this level of aggregation, the higher observed effort for those with high status (be it random or earned) cannot solely be explained by a (social) preference for high effort.

5.2.2 Proposals by Player 1

Next we investigate whether differences in realized effort can be explained by differences in proposals. Figure 3 shows the proposals by player 1, across player 2's types. The

Figure 3: Proposals



Notes: The bars show mean proposals of player 2 efforts, made by players 1, dependent on player 2's type. To ease comparison with Figure 1, the vertical axis covers the same range of effort levels (two units). "Status" refers to player 2's status. Error bars show 95% confidence intervals.

figure shows relatively small differences in the proposed effort in comparison to Figure 1. Indeed, none of the pairwise differences in mean proposed effort is statistically significant at conventional levels (all $p > 0.13$, FPP, all $N \geq 132$).

We also consider the distribution of received proposals (by players 2) across types, see Table 3.

Table 3: Distribution of Proposal

Treatment / Proposal	**Baseline**	**Random status**		**Earned status**	
	–	**Low**	**High**	**Low**	**High**
1	0.08	0.03	0.08	0.04	0.03
3	0.13	0.12	0.18	0.06	0.12
5	0.79	0.80	0.85	0.81	0.83
7	0.90	0.94	0.94	0.90	0.91
9	1.00	1.00	1.00	1.00	1.00
Observations	102	66	66	69	66

Notes: This table reports the cumulative distribution of effort proposals received by players 2 in different treatments. There are 3 more players 2 in the (Low-)Earned Status treatment due to a programming glitch.

Though it appears that High-status individuals receive lower proposals (that is, are given the opportunity to act more selfishly), none of the pairwise differences is statistically significant (Kolmorov-Smirnov, all $p > 0.67$, all $N \geq 132$).

We conclude that the higher effort chosen by players 2 with high status (Figure 1) is also not solely a consequence of their low-status partners proposing this.

5.2.3 Regression Analysis

To further analyze the treatment effects for player 2, we adopt the econometric model depicted in equation 3 below. For the dependent variable Y_i, we focus on the three dimensions of player 2's behavior studied above, i.e., the chosen effort, proposal received, and mean response to the possible proposals. Using order probit, Y_i is regressed on four dummies describing the player types with induced status: low-status player 2 in RS (LR_i), high-status player 2 in RS (HR_i), low-status player 2 in ES (LE_i), and high-status player 2 in ES (HE_i). The dummies all take the value of 0 if player 2 is in BL. We also include a set of background variables (Z_i) in the regression, to wit, country, gender, age, and whether the subject has a major in economics.

$$Y_i = \alpha_i + \beta_1 LR_i + \beta_2 HR_i + \beta_3 LE_i + \beta_4 HE_i + \gamma Z_i + \varepsilon. \tag{3}$$

This model specification identifies the treatment effects between players 2 with unequal social status. On the one hand, the coefficients of the four dummies identify how players 2 with status in a certain treatment group behave differently from players in BL. On the other hand, differences between these coefficients allow us to test for the effects of status within treatments or treatment differences for given status.

We report the regression results in Table 4. The results in column (1) show that, compared to BL, having a high random status statistically significantly increases the chosen effort (with $p < 0.05$). The first row in the second panel of the table shows that people of this type also choose significantly higher effort than someone with low random status (with $p < 0.05$). Hence, the marginally significant differences observed with the Fisher-Pitman tests above become stronger when we correct for background variables.[18] As for the background variables, we find that the country has no significant effect. Note from the regressions of proposals and responses, however, that the Dutch high-random-status players 2 receive significantly lower proposals (that is, they are invited to act more selfishly), while they respond to proposals with significantly higher effort. These two effects appear to balance out in the chosen effort. Moreover, women choose marginally significantly less selfishly then men, while participants who major in business or economics choose lower effort; the latter can be attributed to them on average responding with lower effort to proposals.[19]

[18]If we run the regression without background variables, the treatment dummies are significant at the 10%-level.

[19]It should not come as a surprise that the proposal received is unaffected by the major of player 2, because the proposal is made by player 1, who does not know 2's major. Furthermore, some exploratory analysis where we interact our induced status dummies with the controls suggests that the effects of high status are driven more by men than by women. Because such differences were not part of our original research design, we leave this matter for future research. More details are available upon request.

Table 4: Treatment Effects: Effort, Response, and Proposal

Dependent variable =	**Chosen effort**	**Proposal received**	**Mean response**
Low random status	-0.067	0.152	-0.089
	(0.138)	(0.212)	(0.163)
High random status	0.351**	-0.097	0.211
	(0.168)	(0.202)	(0.209)
Low earned status	0.109	0.297	-0.073
	(0.112)	(0.221)	(0.145)
High earned status	0.214	0.130	0.041
	(0.221)	(0.192)	(0.207)
Netherlands	0.171	-0.860***	0.305**
	(0.135)	(0.177)	(0.130)
Female	0.202*	-0.032	0.155
	(0.109)	(0.115)	(0.131)
Age	-0.017	-0.002	-0.011
	(0.023)	(0.023)	(0.024)
Econ major	-0.291**	0.098	-0.301**
	(0.129)	(0.131)	(0.138)
N	369	369	369
Low Random Status= High Random Status	$p = 0.031$**	$p = 0.135$	$p = 0.156$
Low Earned Status= High Earned Statu	$p = 0.603$	$p = 0.383$	$p = 0.455$
Low Random Status= Low Earned Status	$p = 0.210$	$p = 0.512$	$p = 0.896$
High Random Status= High Earned Status	$p = 0.593$	$p = 0.184$	$p = 0.451$

Notes: The first panel shows regression results for the ordered probit model. 'Chosen effort' is the final effort chosen by player 2. The 'Proposal received' is the proposal that player 2 observes. The 'Mean response' is the average effort across possible proposals, as elicited using the strategy method. "High/Low random status" and "High/Low earned status" are dummy variables. Robust standard errors are clustered at the session level and are between parentheses. The second panel shows the p-values of χ^2-tests for equality of the coefficients for low versus high status within treatments. The third panel shows the p-values of χ^2-tests for equality of the coefficients for random versus earned status for given status level. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Finally, note that aside from the difference in chosen effort between high- and low-random status, none of the variables differ significantly between status within treatment or between treatments for given status.

5.3 Summarizing the Results

What stands out in these results is that participants with induced high random status tend to choose less selfishly that those with low random status and those without induced status. When correcting for background variables, these differences are statistically significant at the 5%-level. Those with earned high (low) status have effort levels that are comparable to participants with random high (low) status, but here we see no statistically significant differences between high and low effort or with the baseline. Moreover, we could not directly link the higher effort by people with high random status to differences in the proposals they receive, nor to distinct response functions to such proposals. The remaining explanation is that both these factors matter weakly, and that together, they generate the significant effect of high status.

The effects we observe suggest two things. First, an interaction between a player 1 of low status with a player 2 of high status yields relatively low selfishness by the latter. Second, contrary to what we expected (cf. Hypotheses 2.I and 2.II) there is no difference between status that is randomly determined and status that is earned. We discuss possible explanations for this lack of a difference in our concluding discussion.

6 Theoretical Model

In this section we present a model to illustrate the effects that social status may have on prosocial behavior. To stay in line with the experimental design, we consider a team of two players who have different social statuses. This mimics the situation where there are clear hierarchies, for example, in business projects that are carried out jointly by junior employees and project managers. We follow the model in Nikiforakis et al. (2014), which contains the element of hierarchy in the workplace, and assume a fixed total effort level.

The game then evolves around the distribution of the effort between two players in a team. Specifically, players work on a project that requires a total effort $\bar{e} = e_1 + e_2$, where $e_i \geqslant 0$ represents the effort by player i, $i = 1, 2$. The cost of effort is $c_i = \alpha e_i$, with $\alpha > 1$. Players' efforts are thus substitutes and they have a common marginal cost of effort α.

The game has two stages. In the first, each player receives a private signal $s \in \{s_H, s_L, \emptyset\}$, where s_H, s_L, and $\emptyset$ denote, respectively, high status, low status, and no information (about status). Based on signal s, each player then forms an evaluation $E(\varphi|s)$ about herself, where φ describes the extent to which an individual is valuable to the team project. We distinguish between high value φ_H and low value φ_L, $\varphi_H > \varphi_L > 0$. We assume that players have a common prior about their value φ, with $\mu_0 \equiv Pr(\varphi_H)$ and $1 - \mu_0 \equiv Pr(\varphi_L)$, $\mu_0 \in (0, 1)$. Let $\mu_H \equiv Pr(\varphi_H|s_H)$, $\mu_L \equiv Pr(\varphi_H|s_L)$, and $\mu_0 \equiv Pr(\varphi_H) = Pr(\varphi_H|\emptyset)$, respectively, denote a player's belief about having high value φ_H after receiving each signal $s \in \{s_H, s_L, \emptyset\}$. The conditional distribution of signal $s \in \{s_H, s_L\}$ is given by

$$\begin{aligned} Pr(s_H|\varphi_H) = & \quad \tau_H & \qquad Pr(s_L|\varphi_H) = & \quad 1 - \tau_H \\ Pr(s_H|\varphi_L) = & \quad \tau_L & \qquad Pr(s_L|\varphi_L) = & \quad 1 - \tau_L, \end{aligned} \tag{4}$$

where $\tau_H, \tau_L \in (0, 1)$.

As in the experimental design, the model distinguishes between three environments. In one, there is no information about status, which corresponds to $s = \emptyset$. In the second, in each team, one member has a low status and the other a high status. This is determined randomly. We assume that this status signal is then uninformative about a player's value. Ergo, $\tau_H = \tau_L$. In the third environment, there are also one low-status and one high-status team member, but these are informative about a player's value, in a manner to be described below. Here, the status signal is assumed to be informative: $\tau_H > \tau_L$.

Lemma 1. *If $\tau_H > \tau_L$, then $\mu_H > \mu_0 > \mu_L$ and $E(\varphi|s_H) > E(\varphi|\emptyset) > E(\varphi|s_L)$.*

Proof. See online Appendix A. □

Lemma 1 shows how these conditional probabilities influence a player's evaluation about her value. It says that, if high-value players are more likely to obtain high status than low-value players ($\tau_H > \tau_L$), then a player's self-evaluation will be relatively higher if she observes high status.[20] In what follows, we will illustrate why this is important for the allocation of efforts between players.

In the second stage, one player is randomly labeled as "player 1" and the other as "player 2". As in the experimental task, player 1 first suggests effort level a for player 2 and $\bar{e} - a$ for herself, denoted by $(\bar{e} - a, a)$. Subsequently, player 2 decides the actual effort levels (e_1, e_2) for both players. We assume that a successful project yields revenue $R > 0$ for each player. Material payoffs are given by

$$\pi_1 = R - \alpha e_1 \qquad\qquad \pi_2 = R - \alpha e_2 - |e_2 - a|, \tag{5}$$

where $-|e_2 - a|$ represents a loss that player 2 incurs from deviating from player 1's proposal a.[21] Notice that this implies an efficiency loss when deviation occurs. We further assume that player 2 cares not only about her material payoff π_2, but also about inequality between players. Importantly, we allow this disutility from inequality to depend on a player's self-evaluation $E(\varphi|s)$. In particular, her utility is given by

$$u_2 = \pi_2 - \beta E(\varphi|s)(\pi_1 - \pi_2)^2, \tag{6}$$

where $E(\varphi|s)(\pi_1 - \pi_2)^2$ means that, with higher self-evaluation, the player cares more about inequality. This represents the notion that a player with higher value displays more responsibility for the team.[22] β governs the degree of disutility from inequality.[23]

[20] This result is supported by responses to the post-experimental survey (cf. section 7.2).

[21] Such a loss is reminiscent of the models in Crawford and Sobel (1982), Dessein (2002), and Galeotti et al. (2013).

[22] Edelson et al. (2018) provide a behavioral and neurobiological basis of the decision to lead. In particular, they identify low responsibility-aversion as one robust determinant of leadership. Individuals with high leadership scores exhibit lower responsibility aversion in group choices.

[23] For inequality concerns, see, e.g., Cox et al. (2007) and Fehr and Schmidt (1999). We also find evidence of inequity aversion in our experiment.

We do not explicitly model the strategic behavior of player 1. Instead, we assume that player 1 may propose any effort level $a \in [0, \bar{e}]$ for player 2. This setting is not only analytically tractable but also consistent with the "strategy method" in our experimental design, where players 2 are asked to give an effort choice for each possible proposal a.

To start, we first show that a player 2 will always exert zero effort when $\beta = 0$. That is, a player 2 will be purely selfish if she has no concerns for inequality.

Proposition 1. *(No inequality concerns) If $\beta = 0$, then player 2's unique optimal strategy is to choose $e_2^* = 0$.*

Proof. See online Appendix A. □

Next, we investigate the case in which player 2 cares about inequality, i.e., $\beta > 0$. Proposition 2 characterizes players 2's optimal e_2^* given proposal $a \in [0, \bar{e}]$.

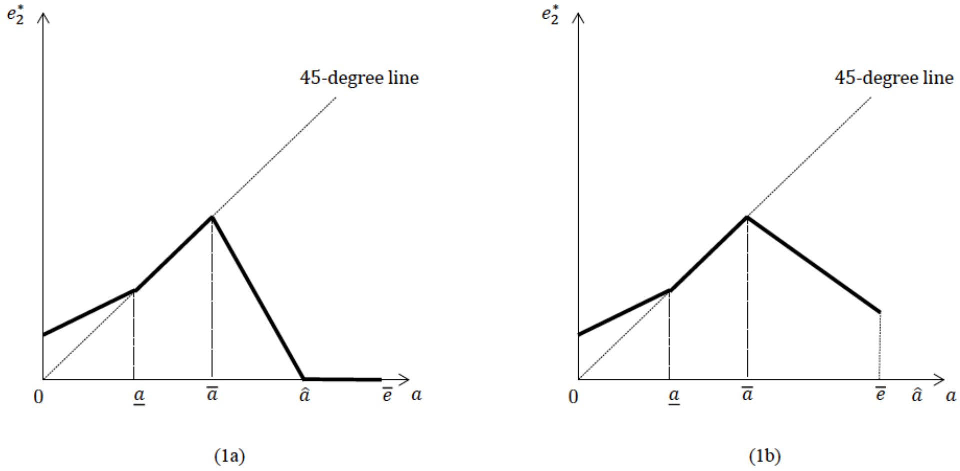
Proposition 2. *(With inequality concerns) There exist cutoff values $\underline{a}, \bar{a}$, with $\underline{a} < \bar{a}$ such that*

(i) if $a \in [0, \underline{a}]$, then $e_2^* = \frac{1}{2\alpha+1}[\alpha\bar{e} + a - \frac{\alpha+1}{2(2\alpha+1)\beta E(\varphi|s)}]$;
(ii) if $a \in (\underline{a}, \bar{a})$, then $e_2^* = a$;
(iii) if $a \in [\bar{a}, \bar{e}]$, then $e_2^* = \max\{\frac{1}{2\alpha-1}[\alpha\bar{e} - a - \frac{\alpha-1}{2(2\alpha-1)\beta E(\varphi|s)}], 0\}$.

Proof. See online Appendix A. □

Figure 4 shows player 2's optimal response function to proposals by player 1. It illustrates that, given signal s, player 2's optimal choice of effort e_2^* is non-monotonic in player 1's proposal a. She is willing to exert more effort than a ($e_2^* > a$) when the proposal a is altruistically low ($a \in [0, \underline{a}]$); she chooses to follow player 1's proposal ($e_2^* = a$) when a is moderate ($a \in (\underline{a}, \bar{a})$). She will, however, exert effort below a ($e_2^* \leq a$) when the proposal is selfish ($a \in [\bar{a}, \bar{e}]$). The reason for this effort pattern is the relative effect of efficiency and inequality concerns. When a is small, her (advantageous) inequality concerns are more important than efficiency concerns; she deviates from the suggested effort level by providing more effort. Though this reduces her material payoffs, it also reduces the

Figure 4: Optimal Effort e_2^* as a Function of a.



Notes: The horizontal axis shows proposal a by player 1 with $\underline{a} < \bar{a} < \hat{a}$; the vertical axis is the optimal effort e_2^* by player 2. The 45°-line shows the situation where $e_2^* = a$. The left panel illustrates the case where $\hat{a} \leq \bar{e}$; the right panel shows $\hat{a} > \bar{e}$. $\hat{a} \equiv sup\{a|e_2^*(a) > 0\}$, which is determined by $\frac{1}{2\alpha-1}[\alpha\bar{e} - \hat{a} - \frac{\alpha-1}{2(2\alpha-1)\beta E(\varphi|s)}] = 0$.

payoff differences. For moderate levels of advice a, efficiency concerns are more important than inequality concerns, and thus player 2 tends to follow player 1's proposal in order to avoid efficiency loss. When a is too large, (disadvantageous) inequality concerns dominate efficiency concerns, and player 2 will choose to balance players' material payoffs even at the expense of efficiency. In this case, we can see that player 2 will diverge more from player 1's proposal as a gets larger. We illustrate the trend of deviations $|e_2 - a|$ in the following proposition.

Proposition 3. *(Deviation trend) The deviation* $|e_2^* - a|$ *is decreasing in* a *when* $a \in [0, \underline{a}]$*, is zero when* $a \in (\underline{a}, \bar{a})$*, and is increasing in* a *when* $a \in [\bar{a}, \bar{e}]$*.*

Proof. The proof follows directly from Proposition 2. □

Let $e_{2,1}^*(\emptyset)$, $e_{2,2}^*(s)$, and $e_{2,3}^*(s)$ denote the optimal effort choices of player 2, respectively (1) without status information; (2) with random and uninformative status signals; and (3) with informative signals. The following proposition illustrates the relative magnitudes of these effort choices conditional on signal $s \in \{s_H, s_L\}$.

Proposition 4. *(Effort comparisons) For all* $a \in [0, \bar{e}]$, $e^*_{2,3}(s_H) \geq e^*_{2,1}(\emptyset) = e^*_{2,2}(s) \geq e^*_{2,3}(s_L)$, $s \in \{s_H, s_L\}$.

Proof. The proof follows from Lemma 1 and Proposition 2. □

Proposition 4 indicates that when status is informative about a player's value a high-status player 2 exerts at least as much effort as any other type of player in any other scenario. At the same time, all other types of player 2 exert at least as much effort as the low-status player 2. The driving force behind this result is the combination of players' heterogeneous beliefs about status (τ_H and τ_L) and inequality concerns. Because the status earning process makes players believe that a high-value player has a higher chance of obtaining high status than a low-value player ($\tau_H > \tau_L$), players who observe high status will have a higher self-evaluation. Then, with higher self-evaluation, these players care more about the equality of players' payoffs, and consequently, they become more generous and voluntarily take more responsibility in the team.

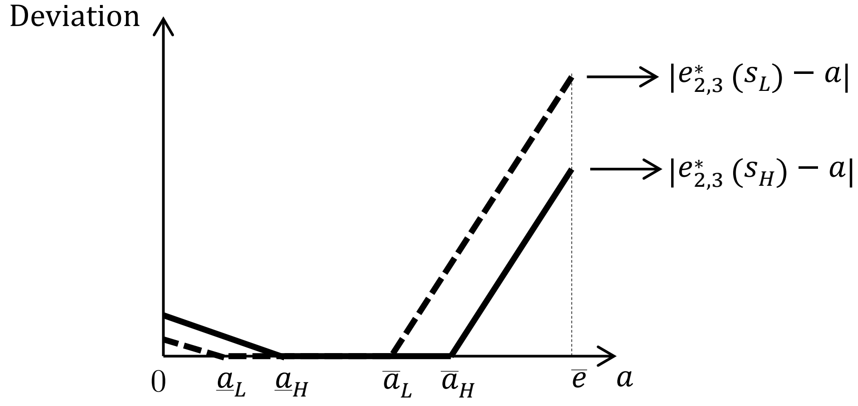
We now compare the deviations between a high-status and a low-status player 2 when status is informative about value, that is, situation (3) with $e^*_{2,3}$ as the optimal effort level. Let $\underline{a}_t$, $\bar{a}_t$, and $\hat{a}_t$ denote the cutoff values as defined in Proposition 2 when $s = s_t, t = H, L$.

Proposition 5. *(Deviation comparisons) Let* $\underline{a}_H < \bar{a}_L$ *and* $\bar{a}_H < \bar{e}$. *Then*
(i) if $a \in [0, \underline{a}_H)$, *then* $|e^*_{2,3}(s_H) - a| > |e^*_{2,3}(s_L) - a|$;
(ii) if $a \in [\underline{a}_H, \bar{e}]$, *then* $|e^*_{2,3}(s_H) - a| \leq |e^*_{2,3}(s_L) - a|$;
in particular, $|e^*_{2,3}(s_H) - a| < |e^*_{2,3}(s_L) - a|$ *if* $a \in (\bar{a}_L, min\{\hat{a}_H, \bar{e}\}]$.

Proof. See online Appendix A. □

Proposition 5 states that a high-status player 2 deviates more than a low-status player 2 when a is small and less when a becomes large (see Figure 5), and there is no difference between a high and low status player 2 when a is moderate ($a \in [\underline{a}_H, \bar{a}_L]$). Hence, this result suggests that for a large range of parameters ($a \in [\underline{a}_H, \bar{e}]$), a high-status player 2 would like to achieve a higher team efficiency than a low-status player 2. This last result

Figure 5: Status Based Deviation.



Notes: The horizontal axis shows proposal a by player 1. The vertical axis gives the absolute value of player 2's deviation from a. Here status is informative about value so that we distinguish between the optimal deviations between a high-status and a low-status player 2.

mirrors what we observed in the laboratory. In the next section, we discuss how the model relates to the experimental results.

7 Discussion

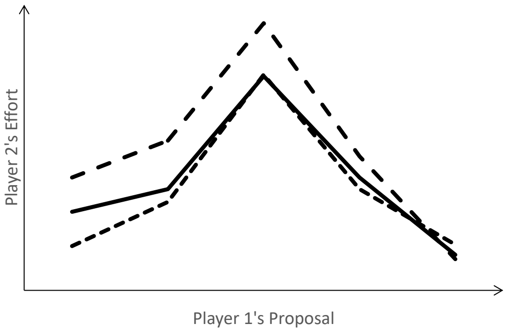
The results from the laboratory experiment show that having high status makes people behave differently than those with low status; in particular, high-status players 2 appear to be less selfish than their low-status counterparts. Here, we compare our results to the theoretical model and discuss possible mechanisms underlying the treatment differences that we observe.

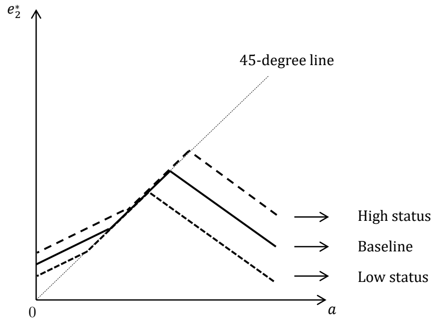
7.1 Result Comparison: Experiment *vs.* Theory

First, we focus on two important variables of interest in the experimental data and see how they relate to the theoretical model in Section 6. One is the response function by players 2 and the other is their deviation from the proposed effort; for each, we compare how they vary in our data to what is predicted by our model.

We compare the effort distributions in Figure 6. The left panel depicts the average

Figure 6: Experimental Results (left) and Theoretical Predictions (right)





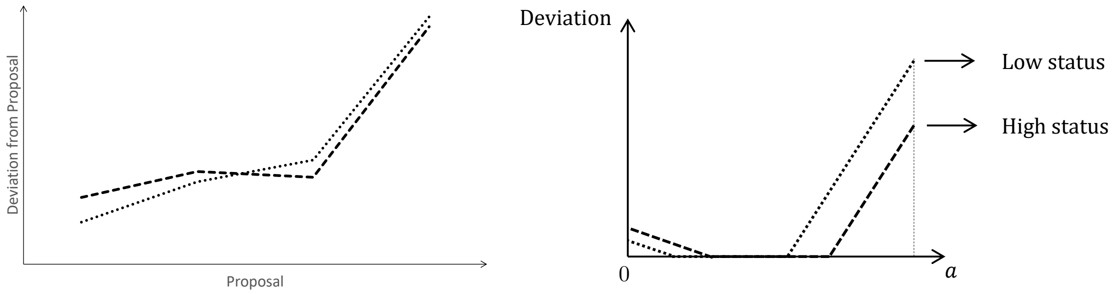
Notes: The horizontal axis shows proposal a by player 1. The vertical axis gives the absolute value of player 2's deviation from a. The figures compare the experimental and theoretical response functions by players 2. The long-dashed line refers to players 2 with high status; the solid line represents players 2 in BL; the short-dashed line depicts players 2 with low status.

effort chosen by players 2 of different status as a function of player 1's proposal. We again pool across status induction treatments and distinguish between high status (in RS or ES), low status (in RS or ES), and no status (BL).[24] The right panel shows the predictions derived from our theoretical model. We observe that our experimental data are highly consistent with the theoretical predictions; first, the overall shape for the effort distribution is similar in both panels; furthermore, players 2 with high status exert higher effort than low-status counterparts, this is especially prevalent when the proposal is not extremely selfish ($a < 9$); in addition, the effort level without status lies between the other two.

Similarly, we can compare the deviations of our players 2 to the player 1 proposals to the theoretical predictions of Figure 5. We do so in Figure 7. Once again, the similarities between the observed and theorized functions are notable. In particular, the absolute deviations are higher after a high signal, when proposals are low, while the deviations are larger after a low signal, when proposals are high. As discussed above, the model attributes the latter result to a wish for high efficiency amongst those with high status.

[24]The model assumes that high-status is informative about a player's value. As we will discuss below, our data suggest that participants in our random-status treatment already attribute some value to high status.

Figure 7: Deviations: Results (left) and Predictions (right)



Notes: The figures compare the experimental and theoretical deviations by players 2 from player 1's proposal. The dashed line refers to players 2 with high status; the dotted line depicts players 2 with low status.

All in all, the qualitative features of our model and experimental results are quite similar. We take this as an indication that the behavioral assumptions underlying the model find support in the behavior of our participants. Note that we do not claim to formally test our model's predictions. The model aims at nothing more (nor less) than to clearly explain the channels through which we anticipate social status to affect behavior. The driving force in the model is that individuals who believe to have a high status relative to the one they are paired with have a larger disutility from inequality than those who believe to have a low relative status.

7.2 The Channel through Beliefs

Our result that high status leads to less selfish behavior is an example of a feeling of *'noblesse oblige'*; this suggests "a social norm that obligates those of higher rank to be honorable and generous in their dealings with those of lower rank" (Fiddick and Cummins 2007). Of course, this should be seen in the context of our model and experiment. Here, the 'obligation' is derived from the assumed relationship between status and inequity aversion, for which (as argued above) our results provide some qualitative support.[25]

[25] As an anonymous reviewer pointed out, it may be a large step to draw conclusions about the role of status in the world outside the laboratory. Nevertheless, we believe that there is little reason to believe that the general relationship between status and other-regarding behavior that we observe in the laboratory (summarized by 'noblesse oblige') would not carry over to other environments. An important question is whether this relationship would be overwhelmed by the many factors in practice that we abstract from. Indeed, an interesting follow-up would be to raise the stakes and create stronger status outside

To further study the role of status, we asked subjects a set of questions at the end of the experiment. These concerned their perceptions towards subjects with low and high status. Using a 7-point Likert scale (from totally disagree to totally agree), subjects indicate their (dis)agreement with various attitudinal statements. The statements we use in our analyses are the following (more information about the other statements is available in online Appendix B):[26]

1. People with stars in my experimental session are cleverer.
2. The method to allocate stars reflects abilities.
3. People with stars in my experimental session deserve to get more in the team-production task.

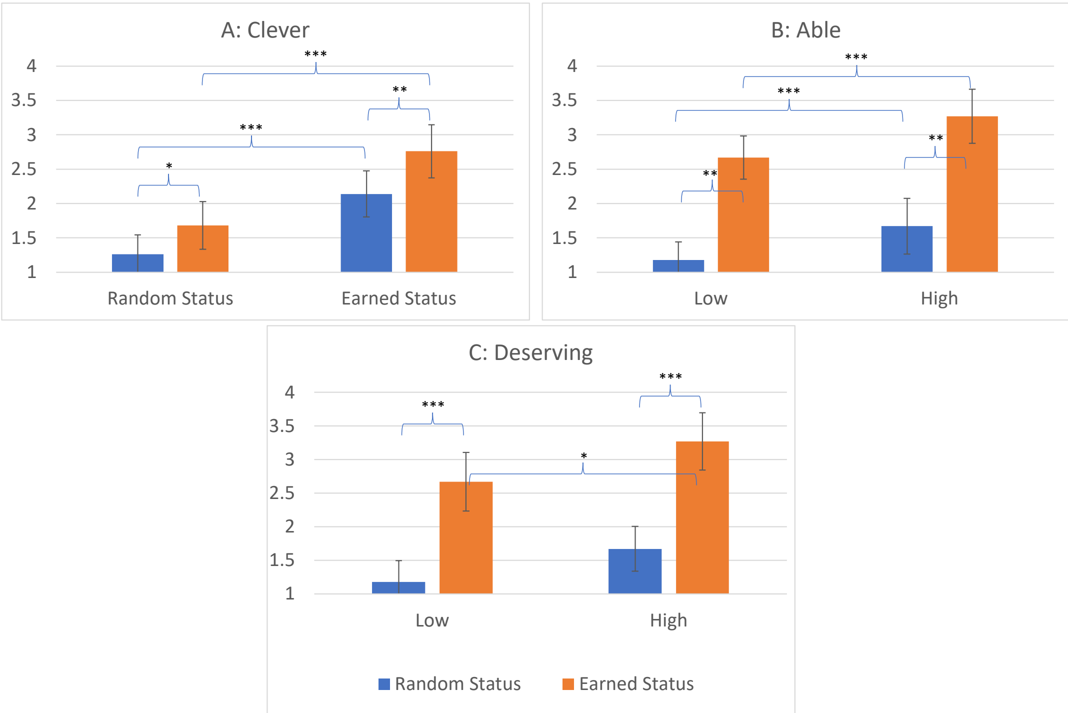
These statements allow us to study how people perceive those who have been allocated high status and whether this perception differs depending on how status is assigned. In Figure 8, we plot the average response to these questions by players 2, distinguishing between RS and ES and subjects with low or high status.[27] A first thing to notice is that there is a clear difference between RS and ES in perceived cleverness, ability, and entitlement. Players 2 in ES have a higher tendency than in RS to report that high status subjects are smarter and more able and that they are more deserving. Therefore, the way we assign status induces differences in beliefs. Importantly, we also find differences within treatments. In particular, participants with induced high status attribute a more important role to status than people with induced low status. We observe this in both treatments; irrespective of whether status is allocated randomly or earned, high-status individuals attribute more positive characteristics to high status than low-status individuals do. This is an indication our RS treatment induces more status differences than we anticipated (in the terminology of our model, status in RS has informative value), which

the laboratory. At this stage, we can conclude that the hypothesized relationship finds support in the laboratory.

[26]The word 'Star' refers to the feature of the experimental design that participants with high induced status received a star.

[27]Because there is no differences in terms of status in BL, subjects were not asked these attitudinal questions.

Figure 8: Beliefs about Status



Notes: Subjects are asked to respond on a 7-point Likert scale ranging from total disagreement to total agreement. The vertical axis starts at the minimum level of 1. The statement in panel A is "People with stars are cleverer"; in panel B it is "The method to allocate stars reflects abilities"; in panel C the statement is "People with stars deserve to get more in the team-production task". The figures display the average scores for players 2 in both RS and ES. Significance is based on FPP tests, with all $N \geq 132$; $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 5: Beliefs of proposal a by Player 2

Treatment	Random Status	Earned Status
Low	4.72	5.12
	(0.286)	(0.254)
High	5.33	5.12
	(0.288)	(0.273)

Notes: Cells show mean proposals expected by players 2. Standard deviations are between parentheses.

is a potential explanation for our result that subjects with high-random status provide higher effort.

7.3 Alternative Mechanisms

Are there other potential explanations for the treatment differences? To begin with, as mentioned above, the behavior of player 1 cannot explain the treatment effects. We established that distinct proposals do not explain the differences in chosen effort. In addition, players 2's response functions cannot depend on players 1, because of the strategy method used to elicit these, where player 2 does not know the decision by a player 1 when making her decision.

Is it the belief of generosity of players 1 that drives the behavior of players 2? For instance, a high-status player 2 may believe that her low status teammate (player 1) is so nice that she will make a proposal in favor of an equal split, while a low-status player 2 has no such belief; high-status players 2 may subsequently reciprocate the (expected) nice proposal by choosing a higher effort. To test such an effect, we elicited the beliefs of players 2 about the proposal by the player 1 she was paired with. This question is incentivized by giving 1 euro for the correct answer. Table 5 summarizes the result. This shows that, on average, players 2 believe the proposal to be between 4.5 and 5.5 units. Importantly, the beliefs are neither statistically different between treatments nor between status (FPP, all $p > 0.14$, all $N \geq 132$). Therefore this alternative mechanism cannot explain our treatment effects either.

8 Concluding Remarks

Social status is seen as an important motivator of human action. High social status not only creates a feeling of "entitlement to certain resources" (Ball et al. 2001), but also serves as a fundamental and universal motive among individuals for evolutionary benefit and attention (Anderson et al. 2015). In this paper, we study the consequences of distinct social status on prosocial behavior. The experiment shows that people with high status are more generous than their low status counterparts. Unexpectedly, the results do not depend on how status is determined in our experiment; though the effort levels are comparable whether high status is randomly acquired or earned the statistically stronger results are found for the random status case.

Our theoretical model depicts a possible mechanism underlying these experimental findings; conditional on their status, people form different beliefs about their responsibility and value to joint work. Having a better ranking is more likely to induce the feeling of having a higher responsibility towards others. Given these beliefs, a higher-responsibility player cares more about the inequality between players, so that high-status players will be more generous than her low-status counterpart. In the words of Drazen and Ozbay (2019): "the fact of holding a position of responsibility may induce one to take account of others, akin to the argument that one chosen as a fiduciary will act in the best interests of the beneficiary due to her position." Similarly, Baldassarri and Grossman (2011) conclude that "monitors ... are willing to sacrifice part of their welfare to increase cooperation." Our results provide support for both assessments.

Nevertheless, one should consider alternative explanations for the patterns that we observe. For example, an anonymous reviewer suggested that being recognized with a star and VIP treatment might create an experimenter demand effect for social behavior or may lead to (upstream indirect) reciprocal behavior in the form of kindness towards others. Indeed, from the behavioral results in Figure 1 and Table 4 themselves it may be difficult to distinguish between our status-based explanation and these alternatives. The discussion in subsection 7.2 (as summarized in Figure 8), however, does allow us to make this distinction. The differences here are statistically very strong. They show that players with induced high status see themselves as much more clever, able, and deserving than players with low status see them. We do not see how any of these attributes would be related to experimenter demand. Indirectly, they might be related to reciprocity. This would be the case if these players want to reward someone (e.g., the experimenter) for putting them in a position where they deem themselves clever, able, and deserving. Note that this would provide a mechanism underlying the link from high status to prosocial behavior. Our results in Figure 8, however, show that the perceived cleverness, ability, and entitlement are higher in the earned status treatment than with random status. Under the reciprocity mechanism, one would then expect stronger reciprocity in the former case, which is not what we observe. Finally, receiving the perks from 'winning' in our experiment might simply make people feel happy, while happiness may be related to prosocial behavior like it is to productivity (Oswald et al. 2015). It is unclear, however, why happiness would make high-status participants relate the stars to being clever, able, and deserving.

The lack of significant differences that we observe between the random-status and earned-status treatments comes as a surprise. The pattern of behavioral and attitudinal differences suggest that our random-status treatment is sufficient to create a 'minimal status' distinction, just like simple group formation in the minimum group paradigm is often enough to create an in-group. It seems that having the status position earned in the way we designed the experiment is insufficient to further change behavior (though it does enlarge the differences in responses to the attitudinal questions reported in Figure 8). This may indicate that scoring well in our painting task is not seen as a strong indication of status. Further research with perhaps other tasks is needed to better understand the role of merit in achieving a high status.

Our results do establish a causal link from social status to other-regarding preferences. We are also able to suggest the mechanism at work. This is that high status comes with a sense of responsibility towards others. The fact that we can find these results in the laboratory environment with a minimal and objectively irrelevant status ranking is remarkable. In the world outside the laboratory, status is much more firmly grounded than in the laboratory. This suggests that the mechanism we observe may well be relevant, or perhaps even stronger, elsewhere. Outside of the laboratory, however, many other factors play a role that may confound the influence of social ranking on social behavior. It is the control that the laboratory offers that has allowed us to uncover this effect.

References

Amir, Dorsa, Matthew R Jordan, and David G Rand. 2018. "An Uncertainty Management Perspective on Long-run Impacts of Adversity: The Influence of Childhood Socioeconomic Status on Risk, Time, and Social Preferences." *Journal of Experimental Social Psychology*, 79 217–226.

Anderson, Cameron, John Angus D Hildreth, and Laura Howland. 2015. "Is the Desire for Status a Fundamental Human Motive? A Review of the Empirical Literature." *Psychological Bulletin*, Vol 141(3): 574–601.

Andreoni, James, Nikos Nikiforakis, and Jan Stoop. 2017. "Are the Rich More Selfish than the Poor, or Do They Just Have More Money? A Natural Field Experiment."(23229): , URL: `https://EconPapers.repec.org/RePEc:nbr:nberwo:23229`.

Andreoni, James, and Lise Vesterlund. 2001. "Which is the Fair Sex? Gender Differences in Altruism." *Quarterly Journal of Economics* 293–312.

Baldassarri, Delia, and Guy Grossman. 2011. "Centralized Sanctioning and Legitimate Authority Promote Cooperation in Humans." *Proceedings of the National Academy of Sciences*, 108(27): 11023–11027.

Baldassarri, Delia, and Guy Grossman. 2013. "The effect of Group Attachment and Social Position on Prosocial Behavior. Evidence from Lab-in-the-Field Experiments." *PloS One*, 8(3): , p. e58750.

Ball, Sheryl B, and Catherine C Eckel. 1998. "Stars upon Thars: Status and Discrimination in Ultimatum Games."Technical report, Citeseer.

Ball, Sheryl B., Catherine Eckel, Philip J. Grossman, and William Zame. 2001. "Status in Markets." *Quarterly Journal of Economics*, 116(1): 161–188.

Bauer, Michal, Julie Chytilová, and Barbara Pertold-Gebicka. 2014. "Parental Background and Other-regarding Preferences in Children." *Experimental Economics*, 17(1): 24–46.

Blau, Peter Michael. 1964. *Exchange and Power in Social Life.*: Transaction Publishers.

Bolton, Gary E, and Axel Ockenfels. 2000. "ERC: A Theory of Equity, Reciprocity, and Competition." *American Economic Review*, 90(1): 166–193.

Bottorf, EDNA A. 1946. "A Study Comparing Art Abilities and General Intelligence of College Students." *Journal of Educational Psychology*, 37(7): 398–426.

Brandts, Jordi, David J Cooper, and Roberto A Weber. 2015. "Legitimacy, Communication, and Leadership in the Turnaround Game." *Management Science*, 61(11): 2627–2645.

Brandts, Jordi, Werner Güth, and Andreas Stiehler. 2006. "I Want YOU! An Experiment Studying Motivational Effects when Assigning Distributive Power." *Labour Economics*, 13(1): 1–17.

Charness, Gary, and Matthew Rabin. 2002. "Understanding Social Preferences with Simple Tests." *The Quarterly Journal of Economics*, 117(3): 817–869.

Chen, Yan, Fangwen Lu, and Jinan Zhang. 2017. "Social Comparisons, Status and Driving Behavior." *Journal of Public Economics*, 155 11–20.

Cohn, Alain, Ernst Fehr, and Michel André Maréchal. 2014. "Business Culture and Dishonesty in the Banking Industry." *Nature*, 516(7529): 86–89.

Cooper, David J, and John Kagel. 2016. *Other-regarding Preferences.* 2: Princeton University Press, 217.

Côté, Stéphane, Julian House, and Robb Willer. 2015. "High Economic Inequality Leads Higher-income Individuals to be Less Generous." *Proceedings of the National Academy of Sciences*, 112(52): 15838–15843.

Cox, James C, Daniel Friedman, and Steven Gjerstad. 2007. "A Tractable Model of Reciprocity and Fairness." *Games and Economic Behavior*, 59(1): 17–45.

Crawford, Vincent P, and Joel Sobel. 1982. "Strategic Information Transmission." *Econometrica: Journal of the Econometric Society* 1431–1451.

Croson, Rachel, and Uri Gneezy. 2009. "Gender Differences in Preferences." *Journal of Economic Literature*, 47(2): 448–474.

Dessein, Wouter. 2002. "Authority and Communication in Organizations." *The Review of Economic Studies*, 69(4): 811–838.

Drazen, Allan, and Erkut Y Ozbay. 2019. "Does 'Being Chosen to Lead' Induce Nonselfish Behavior? Experimental Evidence on Reciprocity." *Journal of Public Economics*, 174 13–21.

Dubois, David, Derek D Rucker, and Adam D Galinsky. 2015. "Social Class, Power, and Selfishness: When and Why Upper and Lower Class Individuals Behave Unethically.." *Journal of Personality and Social Psychology*, 108(3): , p. 436.

Ebeling, Felix, Christoph Feldhaus, and Johannes Fendrich. 2017. "A Field Experiment on the Impact of a Prior Donor's Social Status on Subsequent Charitable Giving." *Journal of Economic Psychology*, 61 124–133.

Eckel, Catherine C., and Sheryl B. Ball. 1996. "Buying Status: Experimental Evidence on Status in Negotiation." *Psychology and Marketing*, 13(4): 381–405.

Eckel, Catherine C., Enrique Fatas, and Rick Wilson. 2010. "Cooperation and Status in Organizations." *Journal of Public Economic Theory*, 12(4): 737–762.

Eckel, Catherine C, and Rick K Wilson. 2007. "Social Learning in Coordination Games: Does Status Matter?" *Experimental Economics*, 10(3): 317–329.

Edelson, Micah G, Rafael Polania, Christian C Ruff, Ernst Fehr, and Todd A Hare. 2018. "Computational and Neurobiological Foundations of Leadership Decisions." *Science*, 361(6401): , p. eaat0036.

Engelmann, Dirk, and Martin Strobel. 2004. "Inequality Aversion, Efficiency, and Maximin Preferences in Simple Distribution Experiments." *American Economic Review*, 94(4): 857–869.

Fehr, Ernst, and John A List. 2004. "The Hidden Costs and Returns of Incentives—Trust and Trustworthiness among CEOs." *Journal of the European Economic Association*, 2(5): 743–771.

Fehr, Ernst, and Klaus M Schmidt. 1999. "A Theory of Fairness, Competition, and Cooperation." *Quarterly Journal of Economics* 817–868.

Fiddick, Laurence, and Denise Cummins. 2007. "Are Perceptions of Fairness Relationship-specific? The Case of Noblesse Oblige." *The Quarterly Journal of Experimental Psychology*, 60(1): 16–31.

Fiddick, Laurence, Denise Dellarosa Cummins, Maria Janicki, Sean Lee, and Nicole Erlich. 2013. "A Cross-cultural Study of Noblesse Oblige in Economic Decision-making." *Human Nature*, 24(3): 318–335.

Fong, Christina. 2001. "Social Preferences, Self-interest, and the Demand for Redistribution." *Journal of Public economics*, 82(2): 225–246.

Galeotti, Andrea, Christian Ghiglino, and Francesco Squintani. 2013. "Strategic Information Transmission Networks." *Journal of Economic Theory*, 148(5): 1751–1769.

Glaeser, Edward L, David I Laibson, Jose A Scheinkman, and Christine L Soutter. 2000. "Measuring Trust." *Quarterly Journal of Economics* 811–846.

Gsottbauer, Elisabeth, Daniel Müller, Samuel Müller, Stefan T Trautmann, and Galina Zudenkova. 2022. "Social Class and (Un) Ethical Behaviour: Causal and Correlational Evidence." *The Economic Journal*, 132(647): 2392–2411.

Guinote, Ana, Ioanna Cotzia, Sanpreet Sandhu, and Pramila Siwa. 2015. "Social Status Modulates Prosocial Behavior and Egalitarianism in Preschool Children and Adults." *Proceedings of the National Academy of Sciences*, 112(3): 731–736.

Harbaugh, William T, Kate Krause, and Steven J Liday. 2003. "Bargaining by Children." *University of Oregon Economics Working Paper.*

Harsanyi, John C. 1966. "A Bargaining Model for Social Status in Informal Groups and Formal Organizations." *Behavioral Science*, 11(5): 357–369.

Heffetz, Ori, and Robert H Frank. 2010. *Preferences for Status: Evidence and Economic Implications.* 1: New York: Elsevier, 69–91.

Hoffman, Elizabeth, and Matthew L. Spitzer. 1985. "Entitlements, Rights, and Fairness: An Experimental Examination of Subjects' Concepts of Distributive Justice." *The Journal of Legal Studies*, 14(2): 259–297.

Homans, George C. 1958. "Social Behavior as Exchange." *American Journal of Sociology* 597–606.

Hong, Kessely, and Iris Bohnet. 2007. "Status and Distrust: The Relevance of Inequality and Betrayal Aversion." *Journal of Economic Psychology*, 28(2): 197–213.

Jung, Minah H, Paul Smeets, Jan Stoop, and Joachim Vosgerau. 2023. "Social Status and Unethical Behavior: Two Replications of the Field Studies in Piff et al.(2012).." *Journal of Experimental Psychology: General.*

Kocher, Martin G, Ganna Pogrebna, and Matthias Sutter. 2013. "Other-regarding Preferences and Management Styles." *Journal of Economic Behavior & Organization*, 88 109–132.

Kumru, Cagri S, and Lise Vesterlund. 2010. "The Effect of Status on Charitable Giving." *Journal of Public Economic Theory*, 12(4): 709–735.

Liebe, Ulf, and Andreas Tutic. 2010. "Status Groups and Altruistic Behaviour in Dictator Games." *Rationality and Society*, 22(3): 353–380.

List, John A. 2004. "Young, Selfish and Male: Field Evidence of Social Preferences." *The Economic Journal*, 114(492): 121–149.

Mujcic, Redzo, and Andreas Leibbrandt. 2018. "Indirect Reciprocity and Prosocial Behaviour: Evidence from a Natural Field Experiment." *The Economic Journal*, 128(611): 1683–1699.

Nettle, Daniel, Agathe Colléony, and Maria Cockerill. 2011. "Variation in Cooperative Behaviour within a Single City." *PloS one*, 6(10): .

Nikiforakis, Nikos, Jörg Oechssler, and Anwar Shah. 2014. "Hierarchy, Coercion, and Exploitation: An Experimental Analysis." *Journal of Economic Behavior and Organization*, 97 155–168.

Oswald, Andrew J, Eugenio Proto, and Daniel Sgroi. 2015. "Happiness and productivity." *Journal of labor economics*, 33(4): 789–822.

Silva, Antonio S, and Ruth Mace. 2014. "Cooperation and Conflict: Field Experiments in Northern Ireland." *Proceedings of the Royal Society B: Biological Sciences*, 281(1792): , p. 20141435.

Silva, Antonio S, and Ruth Mace. 2015. "Inter-group Conflict and Cooperation: Field Experiments before, during and after Sectarian Riots in Northern Ireland." *Frontiers in Psychology*, 6, p. 1790.

Smeets, Paul, Rob Bauer, and Uri Gneezy. 2015. "Giving Behavior of Millionaires." *Proceedings of the National Academy of Sciences*, 112(34): 10641–10644.

Smith, Adam. 1759. "The Theory of Moral Sentiments, ed." *DD Raphael & AL Macfie. Liberty Fund.(Original work published in 1759.)[ELK].*

Trautmann, Stefan T, Gijs Van De Kuilen, and Richard J Zeckhauser. 2013. "Social Class and (Un) ethical Behavior: A Framework, with Evidence from a Large Population Sample." *Perspectives on Psychological Science*, 8(5): 487–497.

Weiss, Yoram, and Chaim Fershtman. 1998. "Social Status and Economic Performance: A Survey." *European Economic Review*, 42(3-5): 801–820.

Zhang, Jipeng, and Huan Xie. 2019. "Hierarchy Leadership and Social Distance in Charitable Giving." *Southern Economic Journal*, 86(2): 433–458.

Zheng, Jin Di, Arthur J. H. C. Schram, and Gönül Doğan. 2021. "Friend or Foe: Social Ties in Bribery and Corruption." *Experimental Economics*, 24 854–882.