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Dominance and submission: Social status biases economic sanctions

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Dominance and Submission: Social Status Biases Economic Sanctions

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Abstract

Social hierarchy is persistent in all almost all societies. Social norms and their enforcement are part of sustaining hierarchical systems. This paper combines social status and norm enforcement, by introducing status in a dictator game with third party punishment. Status is conveyed by surname; half of the third parties face a dictator with a noble name and half face a dictator with a common name. Receivers all have common names. We find that low status men are punished to a greater extent than low status women, high status men, or high status women. Interestingly, discrimination occurs only in male to male interaction. For offers below half, or close to half of the allocated resource, male third parties punish male dictators with common names almost twice as much as their noble counterparts. We find no support for female discrimination. This result suggests that social status has important implications for men's decisions to use economic punishment, and that this holds true in situations where reputation or strategic concerns have no importance.

Key words: Status, punishment, discrimination, experiment
JEL-Code: C91, D03

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1. Introduction

In all societies, normative standards of behavior are enforced by formal and informal sanctions, and the importance of sanctioning possibilities for human economic interaction has been shown extensively (Ostrom, 2000, Fehr and Gächter, 2000, Carpenter and Matthews, 2005). However, despite the growing literature on sanctioning behavior, most studies are performed in anonymous settings without social context. We thus still know little about how punishment is affected by social cues.

This study investigates how relative social status influences sanctioning behavior in a dictator game with third party punishment. The third party punishment game has been constructed and used to investigate norm enforcement (Fehr and Fischbacher, 2004). The status manipulation in this game pertains only to dictators. All participating third parties play against one of four confederates who participate as dictators in every session. The group of dictators consists of two men and two women. One of each gender has a noble name indicating high social status; the other has a common name indicating low status. We can then compare the level and frequency of punishment among third parties facing dictators of different social status.

In society, sanctions are often imposed by third parties, and the important role of people's actions as members of juries, committees and arbitrators has long been recognized. However, instead of sanctions being applied impartially, previous research finds that third party punishment is likely to be shaped by social context such as parochialism or the punishers' relation to the victim (Bernhard et al., 2006; Goette et al., 2006; Lieberman and Linke, 2007). With respect to the topic dealt with in this study, social status has been shown to affect the outcome of court proceedings in favour of higher status individuals (e.g. status of defendants see Sarnecki et al., 2006; Abrams et al., forthcoming, for status of the victim see Phillips 2009).

Status is often defined as the honor or prestige attached to one's position in society. General for many definitions of social status is that, apart from being a commonly recognized ranking of individuals in a given society, it also implies favourable treatment and increased access to resources when high (Weiss and Fershtman, 1998; Ball et al., 2001, Fershtman and Gneezy, 2001). In psychology and sociology, status hierarchies are analysed as a basis on which we construct our beliefs and behavior.¹ Social asymmetries thereby define perceptions of deservingness, implicit performance expectations and shape appropriate behavior (Weber, 1924; Cummins, 2000; Oxby, 2002). According to this literature, knowledge of relevant status relations is thus crucial to act successfully in social situations and relative status is likely to have a fundamental impact on human decision making.²

In this study we use noble names as a marker of high status; an indicator of possessing ascribed status through membership of the nobility. Using name as a status characteristic has many advantages. Most importantly, it is exogenous to the experimental setting and can be introduced without drawing any attention to the status manipulation in itself. Participants thus remain ignorant about the true aim of the study. Nobility has also been shown to have behavioral implications in the Swedish marriage market. Almenberg and Dreber (2009) find that noble individuals are more likely than commoners to find a partner from a higher wealth bracket than themselves. Further, possessing a noble name has no institutional meaning; the

¹ For similar thoughts in economics see Akerlof and Kranton (2000) who discuss the impact of identity and social category on economic behavior.

² See for example the literature on Status Characteristics Theory, originally developed in Berger et al. (1966). It suggests that power and prestige rankings arise in interactional settings based on individual characteristics. Individuals possessing high status characteristics (such as being white, adult, male or tall) are judged as more able and better performing, as well as more deserving, independent of their actual performance (Hong and Bohnet, 2006). Status Characteristics Theory thus predicts subordination and superordination due to a voluntary and partly unconscious process (Webster and Driskell, 1978). Though SCT has also been criticized, a large literature of empirical studies confirm that status characteristics have powerful and predictable effects on how we judge other individuals, and what we expect from them (Kalkhoff and Barnum, 2000; Ridgeway et al, 1998; Hong and Bohnet, 2006; Simpson and Walker, 2002).

Swedish nobility lost its last formal privileges in the 19th century. However, the surnames remain as explicit hereditary status markers.³

Previous literature in economics indicates that social status does affect economic behavior. In laboratory studies, high social status seems to imply larger economic gains. Ball and Eckel (1996 and 1998) and Ball et al. (2001) investigate the economic benefit of experimentally manipulated status in an ultimatum game and a double oral auction with multiple equilibria. Participants in the high status group receive better offers in both games, and this effect is persistent even in a treatment where allocation to the high status group is obviously random.⁴ In addition the authors test for the possibility of a status induced change in bidding behavior by rewarding status in private. In this treatment, where low status individuals are unaware of the status rewarded, the effect of status disappears. High social status thus appears to induce favourable treatment partly due to deference on behalf of lower status individuals. Preferential treatment of high status participants is also found by Glaeser et al., (2000) and Harbaugh et al. (2001) in the trust game. In both studies, participants with high status are found to elicit more trustworthy behavior on behalf of the trustees.⁵ However, the studies by Ball and Eckel (1996, 1998), Ball et al. (2001) and Glaeser et al. (2000) investigate the impact of social status in a non-anonymous setting, and hence cannot distinguish between the effect of reputational or strategic concerns versus deference.

This study extends previous research in a number of ways. First, the setting is semi-anonymous. Semi-anonymity is achieved by revealing the names of the players participating

³ The last occasion a person was raised to the nobility in Sweden was in 1902, and the Swedish monarch has since then lost the right to ennoble. Surnames pertaining to a specific family benefit from stronger protection in the Swedish name law than more frequently occurring names.

⁴ The experiment includes two treatments, and group allocation is random in both. However, whereas one of the allocation mechanisms is based on a public lottery, the other treatment divides subjects based on a trivia quiz.

⁵ Glaeser et al., 2000 investigate behavior in a sample of Harvard undergraduates. The participants meet their counterpart before they are separated again and play the trust game. As status variables the authors consider for example hours worked for pay, hours spent volunteering, father's education, number of close friends and proxies for popularity. Harbaugh et al., 2001 study the behavior of children aged 8, 11, 14 and 17. Age is here seen as a status marker.

in the dictator game to the third party, but at the same time keeping the identity of the third party unknown to all other players. This allows us to examine whether social status influence punishment in a transparent way, absent effects of potential future interactions. Second, by using the third party punishment game (Fehr and Fischbacher, 2004), we examine the effect of status through the sanction choices of individuals whose payoff is independent of the decisions previously taken. Third, earlier literature within economics has investigated preferential treatment in the reward domain. We here investigate whether social status also moderates sanctioning behavior.⁶ The inclusion of one participant of each gender in each status category also allows us to investigate gender and status interactions. Gender itself is highly connected to social status and previous research indicates that men are more sensitive to social hierarchies (Campbell, 2002). For example, male groups develop steeper hierarchies and behave more competitively than female and mixed groups (Colarelli et al., 2006). In a laboratory experiment, Huberman et al., 2004 find that male participants sacrifice more resources to obtain social status than female. Fershtman and Gneezy (2001) also find an inter-male discrimination only when they study discrimination in the trust game among Jews of different ethnicity. No discrimination is found on behalf of female participants.

Our results indicate that low status men are punished to a greater extent than low status women, high status men, or high status women. Interestingly, discrimination occurs only in male to male interaction. For offers below half, or almost half of the allocated resource, male third parties punish male dictators with common names almost twice as much as their noble counterparts. We find no support for female discrimination.

Differential treatment in the third party punishment game can arise due to different reasons. Therefore, having performed the third party punishment game, we also ran a dictator game.

⁶ Ball and Eckel 1996 perform ultimatum games with status manipulations, but they report no results regarding the responder behavior.

The confederates, who in the first game acted as dictators, are here featured as recipients. If punishment evolved as a norm enforcing mechanism within relatively stable groups of individuals, altruistic behavior including altruistic punishment, should primarily pertain to in-group members. If noble individuals are considered as out-group and commoners as in-group we would then observe higher punishment of norm violations committed by low status dictators in the third party punishment game and higher transfers to low status recipients in the dictator game. If discrimination arises due to liking of a particular status group, this group would experience lower punishment in the third party punishment game and receive higher giving in the dictator game to this group.

The dictator game indicates no discrimination in transfers. We therefore find support neither for an in-group bias nor a difference in liking. We can therefore only speculate why discrimination arise in the punishment domain.

The rest of the paper is organized as follows. The subsequent section describes the experiment design of our study. In section three we present our results, before we conclude in section four where we discuss the possible explanations for our findings as well as future research.

2. Experimental design

The study consists of two separate economic games, a third party punishment game and a dictator game, each with the same status manipulation. Social status is differentiated via the participants' surname, as explained below. All participants in the third party punishment game received a show up fee of 50 SEK⁷.

The third party punishment game has three participants, a dictator, a recipient and a third party. The implementation of the third party punishment game is similar to that of Fehr and Fischbacher (2004), where the dictator is endowed with twice the amount of the third party. In

⁷ At the time of the experiment 1 USD corresponded to about 6 SEK, i.e. 100 SEK was about 15 USD.

our setting the dictator received 100 SEK and the third party 50 SEK. The recipient gets no money and has no decision to make. The dictator can transfer money to the recipient in multiples of 10 SEK, with a maximum of 50 SEK. Thereafter the third party decides, according to the strategy method, on potential punishment of the dictator's payoff.⁸ For each SEK that the third party chooses to punish the dictator's payoff is reduced by three. The payoffs (W_i) of the third party punishment game are thus:

$$\text{Dictator: } W_d(x,p)=100-x-3*p$$

$$\text{Third party: } W_p(p)=50-p$$

$$\text{Recipient: } W_r(x)=x$$

where $x=\{10, 20, 30, 40, 50\}$ is the sum the dictator transfers to the recipient and $p=\{0,1,2,...,50\}$ is the punishment imposed by the third party.

Subjects were randomly allocated to the roles of recipients and third parties. For the position of dictator we recruited a group of four people; a woman and a man with the noble name von Essen, and a woman and a man with the common name Andersson.⁹ This group participated as dictators in every session. Written instructions were distributed and read before making the decisions, and all third parties answered a set of control questions to ensure that they understood the consequences of their decisions. The recipients were asked to state their expectation concerning the third party punishment, also using the strategy method.

⁸ The strategy method is elicitation of contingent responses. The third party made a sanctioning decision contingent on each possible transfer level before being informed of the dictator's decision. It is possible that this elicitation method induces different behaviors compared to a situation where the third party knows the dictators transfer decision (called the "specific response method"). Evidence from Cason and Mui (1998) and Brandts and Charness (2000) do not indicate that this is the case.

⁹ These names are used as they are very strong indicators of nobility and vice versa. Von is a well known indicator of Swedish nobility and names ending with -sson are the most common names in Sweden. Andersson is the second most frequent surname. Swedish law awards intellectual property rights to surnames depending on how distinct they are. Names with the prefix von and other noble surnames are protected such that that a common person cannot add von to his or her surname (Statistics Sweden http://www.scb.se/Grupp/allmant/BE0801_2005K04_TI_10_A05ST0504.pdf, Access 090122). Andersson was chosen since we had easy access to people with that name who could participate in the study. The noble name of one of the authors was never revealed to the participants. Due to Swedish tax regulations we had to collect the name and address of all participants after they had completed the experiment. We were therefore able to control for whether the third parties were noble or not. In the sample of third parties there were none with a noble name.

The status manipulation is apparent only to the third party, who sees the names of the two dictator game participants on top of the decision sheet. The experiment is thus semi-anonymous such that the third party knows the name of the dictator he or she punishes. In other aspects the game is anonymous and the third parties and recipients are aware of this. Apart from the names on the decision sheet, no reference was made to status or gender, and no subject indicated any interest in the names, nor in any aspect of status or gender. Each subject also answered a number of survey questions about age, gender, income, motives and beliefs about other player's income and wealth. This gives us an indication about the mechanisms behind the observed result.

Based on the results from the third party punishment game only two of our confederates in the third party punishment game, the common and the noble man, were used as recipients in the dictator game. The dictator was endowed with 100 SEK and the recipient with was endowed with no money. Money could be transferred from the dictator to the recipient in multiples of 10 SEK, with a maximum of 50 SEK. The recipient had no decision to make.

The dictator game was run on a separate sample consisting only of male students. The status manipulation was semi-anonymous and implemented in the same way as in the third party punishment game. Each dictator saw the name of the recipient on top of his decision sheet. Apart from this, no reference was made to the other player or to status. In both games subjects were placed at separate locations and each session took approximately 20 minutes.

3. Results: Does sanction behavior vary with social status?

In this section, we start by presenting the general results regarding third party behavior. Thereafter we address the effect of the dictator's status category and gender on third parties decisions. Throughout the analysis we explore the proportion of punishment, i.e. the percentage of those who punished, as well as the level of punishment. To calculate the

proportion of punishment we define the binary variable punishment, defined as a positive payment on behalf of the third party at any transfer level. Punishment level is simply the average punishment across the third party sample at a specific transfer level. We end by discussing the underlying mechanisms behind the results, by studying the behavior in a dictator game as well as the effect of third party beliefs regarding dictator wealth and income.¹⁰

3.1 General results

In total, our sample consists of 132 observations of third party behavior, 63 male and 69 female.¹¹ 14 of these observations were removed from the sample. In a majority of the cases this was due to subjects indicating that they knew another participant, or incapacity to understand the experimental setup.¹²

We find that the majority of the third parties do punish, and the majority of the recipients also expect them to do so. Figure 1a shows the average proportions of actual and expected punishment for each transfer level. The figure indicates that recipients expect a lower percentage of third parties to punish than who actually do so, apart from level 50 where spiteful behavior is expected to be more common than we observe. Similarly, the difference between expected and actual punishment level is only significant at the level of 50 (see table

¹⁰ None of our variables were normally distributed according to a skewness and kurtosis test. For all relevant tests in the analysis, we have therefore performed a Mann-Whitney test as well as a two-sided t-test. Throughout the analysis we refer only to the p-value for the Mann-Whitney test unless there are differences in significance between the measures (at the 5 % level). When testing the equality between proportions we have performed a chi square test and a parametric test of proportions. If nothing else is stated the chi square test is presented.

¹¹ The participants came from three different Universities in Stockholm (Stockholm University, Stockholm School of Economics and Stockholm Royal School of Technology). We found no difference in punishment between the three schools.

¹² When running the experiment, we considered it important that participants understood the consequences of their actions. Further, we wanted to avoid participants with a previous personal relation that could influence their . 10 of the 14 observations dropped were removed due to incapacity to correctly fill in the control questions before the actual experiment started or due to subjects indicating that they knew another participant. The remaining 4 third party observations were removed due to incomplete answers in the actual experiment. Of the 14 dropped third party observations 8 were males and 6 females. We also had two participating noble subjects as recipients. In these cases we removed the von in the names, which resulted in non noble names existing in Sweden.

1d in appendix). The effect however, is reversed. The proportion of punishers and the level of punishment we observe in our sample are in accordance with earlier studies (see for example Fehr and Fishbacher, 2004; Leibbrandt and López-Peréz, 2008).¹³

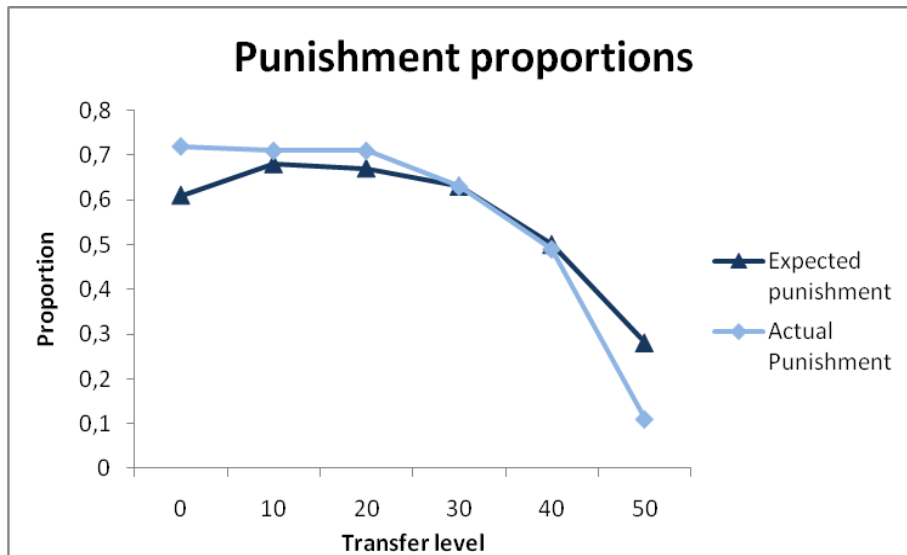


Figure 1a. Proportion of actual and expected punishment.

For each 10 SEK reduction of transfer from the dictator, the third party imposes an average punishment of slightly more than 3 SEK, or a deduction of about 10 SEK. Thus, in expectance, the dictator is left with 50 SEK no matter what he or she chooses to do. The average punishment for a dictator who keeps the whole endowment was 17 SEK, deducing the dictator's income with 51 SEK.

In the next section we focus on the distribution of punishment based on two dictator characteristics; gender and nobility. All our third parties have a non noble name, implying that we compare the punishment decision of a common third party facing either a noble or a common dictator.

3.2 Punishment based on dictator nobility and gender

¹³ We find close to significant gender differences in proportion of punishment and punishment expectations. 65% of the men and 79% of the women choose to punish ($p=0.09$). The corresponding numbers for expected punishment among male and female recipients is 60% and 76% ($p=0.06$). The level of punishment among third parties and the expected level of punishment among recipients do not vary by gender at any level of punishment.

Variation in social status and gender entails four dictator categories in our experiment; noble women (NW), common women (CW), noble men (NM), and common men (CM). Among the common male dictators, 90% are punished at least at any level. The proportion of punishment in the other three categories lies between 60-70%. Testing for equality of punishment proportions between common men and the other groups we find a significant difference compared to noble and common women, and a close to significant difference in relation to the group noble men (p-values 0.05, 0.01, and 0.09 respectively, see table 1c in appendix). This is an indication that both gender and social status play a role for sanctioning behavior.

Figures 2a-e below illustrate the average level of punishment at each transfer level, separated by the two dimensions; gender and nobility.¹⁴ Figure 2a shows the average level of punishment of noble versus common dictators. The difference between the two categories is not significant, but the point estimate is higher for common dictators. The following figure, 2b, shows the average punishment at each transfer level for female and male dictators separately. The total level of punishment and level of punishment at each transfer levels apart from 50 have p-values around 0.05, indicating that male dictators on average are punished harsher than female (see the corresponding p-values in table 2b in appendix).

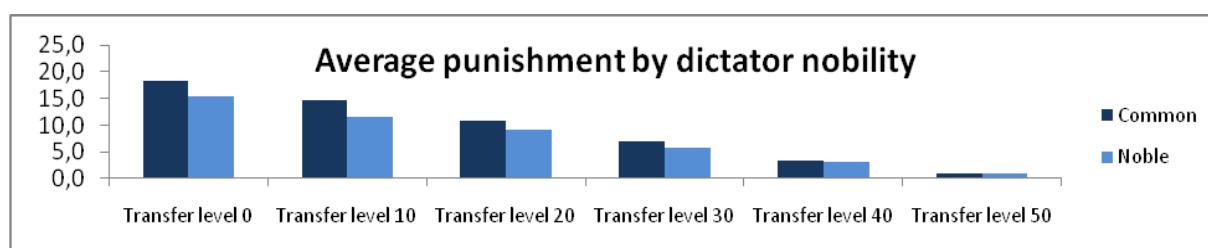


Figure 2a. Average level of punishment split by dictator nobility.

¹⁴ Subsequent Mann-Whitney p-values for test of equal averages in figures 2a-e are found in table 2 a-e in appendix. We report p-values for each transfer level, the total level and the total level excluding levels 40 and 50.

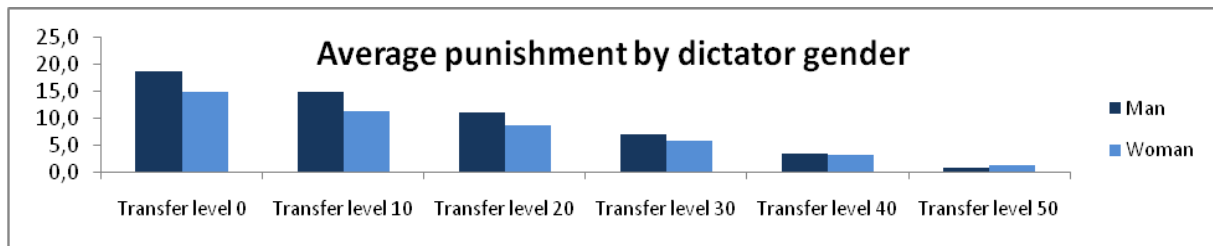


Figure 2b. Average level of punishment split by dictator gender.

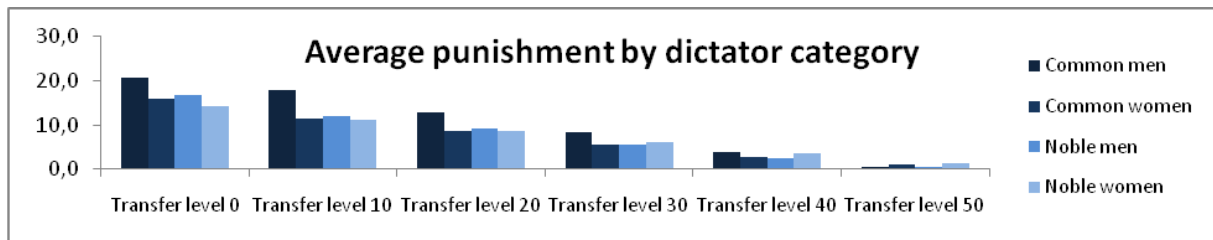


Figure 2c. Average level of punishment split by dictator nobility and gender.

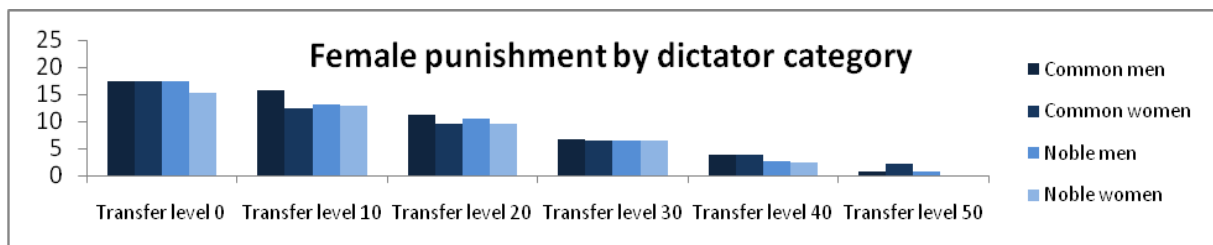


Figure 2d. Average level of female punishment split by dictator category.

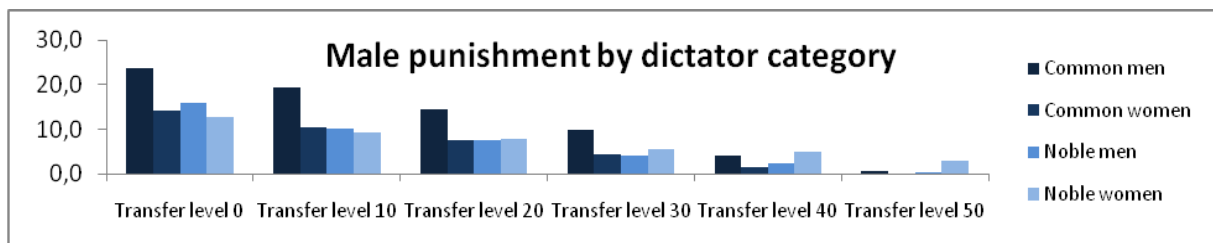


Figure 2e. Average level of male punishment split by dictator category.

Based on the results on punishment proportion we expect the group of common males to be punished the harshest. Figure 2c therefore shows a comparison of average punishment level of all four dictator categories, confirming that this is true. Table 2c below states the p-values for comparison of punishment levels between common men and all other categories.

Table 2c. Punishment by dictator category.

Transfer level	CM	NW	CW	NM	P-values	N
0	21.3	14.2	15.9	16.7	0.03, 0.06, 0.20	29, 32, 28, 29
10	17.8	11.3	11.5	12.0	0.01, 0.02, 0.03	29, 32, 28, 29
20	12.9	8.8	8.6	9.3	0.03, 0.02, 0.10	29, 32, 28, 29

30	8.4	6.0	5.6	5.4	0.07, 0.03, 0.08	29, 32, 28, 29
40	4.0	3.5	2.6	2.6	0.10, 0.02, 0.13	29, 32, 28, 29
50	0.7	1.3	1.1	0.6	0.39, 0.43, 0.74	29, 32, 28, 29
Total	65.1	45.1	45.4	46.6	0.02, 0.02, 0.08	29, 32, 28, 29
Total -50	64.5	43.8	44.3	46.0	0.05, 0.02, 0.07	29, 32, 28, 29
Total -40	60.5	40.3	41.6	43.4	0.02, 0.02, 0.08	29, 32, 28, 29

NW =Noble women, CW=common women, NM=noble men, and CM=common men. The variable “Total -50” compounds punishment on all levels except level 50. The variable “Total -40” compounds punishment on all levels except level 50 and level 40. Sample size per group is reported in the order NW, CW, NM, CM. P-values indicate the probability of equal punishment between common men and the other categories respectively (noble women, common women and noble men). Using a two-sided test some of the differences in punishment between common men and noble and common women are insignificant, see appendix table 2c.

Based on the differences in punishment level between male and female third parties figure 2d and 2e report the same numbers as in table 2c split by gender of the third party. Female punishment level, depicted in figure 2d and in table 2d in appendix, shows small, insignificant and inconsistent differences in punishment across dictator categories. This result stands in stark contrast to the punishment by men (figure 2e and table 2e). At transfer levels 0-30, where the dictator is most stingy, male third parties punish common male dictators almost twice as much as they punish noble ones. At each level between 10 and 30, as well as the total level, this difference in punishment is significant.¹⁵ For the levels 0-20, the difference in punishment is 7 SEK or more, implying an additional reduction of 20-30% of the common dictators’ initial endowment. Thus our results indicate that sanctions in male to male interaction are influenced by relative status, as hypothesized in the introduction. High status males appear to be treated with leniency by other common male third parties.

Table 2e. Male third party punishment by dictator category.

Transfer level	CM	NW	CW	NM	P-values	N
0	24.3	12.7	14.1	15.8	0.04, 0.05, 0.13	14, 13, 12, 16
10	19.4	9.2	10.5	10.3	0.02, 0.04, 0.02	14, 13, 12, 16
20	14.4	7.8	7.5	7.5	0.04, 0.03, 0.04	14, 13, 12, 16
30	9.9	5.6	4.5	4.2	0.06, 0.04, 0.04	14, 13, 12, 16
40	4.2	4.9	1.4	2.4	0.21, 0.03, 0.21	14, 13, 12, 16
50	0.6	3.0	0.0	0.4	0.42, 0.37, 0.88	14, 13, 12, 16

¹⁵ The 0 level is not significant in our study due to a few male subjects indicating double norms. These subjects motivated their punishment by either you give a lot or nothing.

Total	72.9	43.2	37.9	40.6	0.04, 0.02, 0.05	14, 13, 12, 16
Total -50	72.3	40.2	37.9	40.2	0.04, 0.02, 0.05	14, 13, 12, 16
Total -40	68.1	35.4	36.5	37.8	0.03, 0.03, 0.04	14, 13, 12, 16

NW =Noble women, CW=common women, NM=noble men, and CM=common men. The variable “Total -50” compounds punishment on all levels except level 50. The variable “Total -40” compounds punishment on all levels except level 50 and level 40. Sample size per group is reported in the order NW, CW, NM, CM. P-values indicate the probability of equal punishment between common men and the other categories respectively (noble women, common women and noble men). Some p-values for the group of common men compared to noble women are insignificant when running a two-sided t-test, see appendix table 2e.

In summary we find that the punishment decision of male third parties is affected by both the social status and the gender of the perpetrator. Female punishment decisions exhibit no consideration of social status.¹⁶

3.3 Giving in a dictator game

The discrimination in punishment that we observe can be due to at least two types of underlying mechanisms. First, in-group bias among common men would cause norm violations by in-group members to warrant harsher punishment than violations by other individuals, in order to successfully enforce norms within the group¹⁷. Second, common men might simply like noble men more than common men and therefore provide noble men with an economic premium.

In order to separate these mechanisms we also ran a dictator game. 59 males participated in the game; we assigned 31 subjects to face a recipient with a common name and 28 subjects to face a recipient with a noble name.¹⁸ Our results indicate that giving in the dictator game does not depend on the status of the recipient. On average common men receive 34.2 SEK and noble men 36.8 SEK, but this difference is far from significant (p-value of 0.2809)¹⁹. In the

¹⁶ The analysis indicates that third party punishment behavior is dependent on the third party’s relation to dictator characteristics. We therefore also studied whether third party discrimination was affected by gender composition of the dictator game participants. For example, we tested whether a male third party facing a male dictator punished differently depending on the gender of the recipient. We found no indication that this relation mattered. The sample sizes in each group are very small therefore this should be seen as mere indications.

¹⁷ However previous empirical literature indicates that out-group members are punished harder when the victim is an in-group member (Bernhard et al., 2006; Lieberman and Linke, 2007).

¹⁸ All participants were students at Stockholm University or Stockholm Royal School of Technology.

¹⁹ A sample size analysis assuming an alpha of 0.05 and a power of 80% indicate that we would need a sample

study by Fershtman and Gneezy (2001) a difference is found in trust behavior depending on social category. However, in line with our results, no differentiation based on social category is found in a dictator game. Our results do thus neither support the explanation of in-group bias nor that of liking. They point out that discrimination depending on status pertains only to the punishment domain, and not to giving.

3.4 Further analysis

The discrimination based on social category that we observe might also be due not to social status per se but to variables correlated, or perceived to be correlated, with nobility. Nobility may for example influence beliefs about dictator wealth, income or education. We identify two potential sources of bias. First, if variables believed to be correlated with nobility have status implications in their own right, this leads us to overestimate the effect of nobility. Second, beliefs of high wealth or income may also reinforce mechanisms not directly linked to status such as inequality aversion (Bolton and Ockenfels, 2000; Croson and Gneezy, 2009; Fehr and Schmidt, 1999). If participants believe that nobility is positively correlated with wealth, inequality aversion would cause us to underestimate the effect of social status (nobility). As shown in Almenberg and Dreber, 2009 the Swedish nobility has a higher wealth than the common population. The fact that women are found to be more inequality averse than men could be a contributing factor to the gender differences in discrimination we find (Andreoni and Vesterlund 2001, Dickinson and Tiefenthaler 2002, Selten and Ockenfels 1998).

All third parties in the third party punishment game were asked to state their beliefs regarding dictator wealth and income in relation to the average student and all dictators in the dictator game were asked to do the same with respect to the recipient. The number of third parties who

size of 2096 subjects in order to get significant results. See appendix table 3a for descriptive statistics.

indicated that they believed the dictator to have a higher wealth and income than the average student are roughly equal irrespective of whether they faced a noble or a non-noble dictator.²⁰

Further, what subject's rate as being fair is not influenced by the status of the recipient in any of the two games. Further, 82 percent of participants consider an equal split as fair behavior. This corroborates the findings of Lieberman and Linke (2004), who find that even though third party punishment varies with social category, the third parties' moral judgement pertaining to the norm violation does not. It thus appears as if it is the scale of punishment that differs across status categories, not the judgement of the norm in itself. These results indicate that social status, also when controlling for beliefs of relative income and wealth, has an impact on costly punishment behavior in male to male interactions when distribution norms are violated. We also performed regression analysis which confirm our main results and indicate that third party beliefs concerning the wealth and income of the dictator as well as fairness have no significant effect on punishment.²¹

4. Discussion

Previous research in economics indicates that high social status conveys an economic premium (Ball and Eckel, 1996, 1998; Ball et al., 2001; Glaeser et al., 2000; Almenberg and Dreber, 2009). Our results illustrate that high social status induces lower punishment in a third

²⁰ Of those third parties facing a noble dictator, 17 (12) subjects thought their counterpart to had a higher wealth (income) than the average student. Among those facing a non-noble dictator, the corresponding number was 16 (14). These numbers are evenly distributed among men and women. Male noble dictators playing a third party who assumed him to have a wealth above average, are punished the least of all groups. Non-noble dictators, whose third party assumed him to have a high wealth are punished the harshest. In the male-to-male punishment of commoners the effect of wealth beliefs goes in the opposite direction. However, the sample sizes are too small for a relevant analysis.

²¹ The OLS regression analysis is based on parametric assumptions that may not be fulfilled. The same set of control variables was included in the regression for each punishment level; beliefs about income, wealth and fairness, gender of all players, university and age of third party. The variables for beliefs regarding wealth and income were coded as 1, if third parties who believed the dictator to have a wealth (income) above the average student and 0 otherwise. The variable for fairness was coded to take the value 1 if subjects indicated an equal split of the initial dictator endowment as fair and 0 otherwise. We also pooled the data over all six decisions elicited by the strategy method for each third party, clustering on individual third parties. In all regressions male to male discrimination is significant (p-value 0.033), and beliefs of wealth and income remain insignificant. The results from the regression analysis are available upon request.

party punishment game, though only in male to male interactions. Male third parties punish common male dictators almost twice as much as their noble counterparts, but no effect is found in female to female or mixed interactions. We do not find a discriminatory effect of social status on altruistic behavior in a dictator game; male participants are not more generous to high status individuals.

For several reasons, the effect of social status in the third party punishment game is surprisingly large. The Swedish nobility lost all its formal economic and political privileges in the 19th century. The status variable thus has no relation to the experimental context or to merit, and no references were made to name, nobility or social status during the experiment. The semi-anonymous design also diminishes reputation and strategic concerns. Despite this, the average punishment is significantly different between male status categories, and this difference represents 20-30 percent of the dictators' initial endowments. The effect remains stable when controlling for beliefs of wealth and income, and does not rely on fairness considerations being status dependent.

Our results corroborate previous research implying that men are more sensitive to social status in economic decision making tasks (Fershtman and Gneezy, 2001; Huberman et al, 2004). Many hierarchies in western society have throughout history been exclusive for men or male dominated. Nobility in Sweden, for example, is only hereditary on the male side; thus historically implying a larger value for men. If men were and are more likely to benefit from status, such as nobility, this explains the higher level of investment in status observed by men in comparison to women (Campbell, 2002; Huberman et al., 2004; Pawlowski et al., 2000). Men are also often found to be more competitive compared to women (see review by Croson and Gneezy, 2009). Since noble names are impossible to acquire, competition for status in the context of the present study is relevant only within the group of non noble names. An additional reason for the discrepancy in male and female behavior could be gender differences

in inequality aversion. Previous literature has found women to be more inequality averse compared to men (Andreoni and Vesterlund, 2001; Dickinson and Teifenthaler, 2002; Selten and Ockenfels, 1998). If high social status is associated with other benefits, females should punish high status individuals more.

A few studies have explored in-group bias settings with third party punishment (Bernhard et al. 2008 and Götte et al. 2006). Contrary to what is found in this study, Bernhard et al. (2006) find that dictators from another group than the third party are punished harsher when facing a recipient from the same group as the third party. Lieberman and Linke (2004) found similar results in a hypothetical setting. This is the opposite of what in-group bias in a third party punishment game would predict if punishment serves as a norm enforcing device. All our third parties and recipients are from the same status group, individuals with non noble names. The divergence of our results in relation to the other studies may partly be explained by the fact that individuals with a common name can be considered a large and not well defined social group, or that status considerations override group belonging. Our results also differ from what Fehr et al. (2008) find in a trust game with third party punishment in India. They find that low caste participants punish less than high caste participants, but punishment in both groups is independent of the caste belonging of the norm violator. Several potential mechanisms might explain this variation in results. Norm enforcement could, for example, differ between cooperative and distribution norms. Fehr et al. (2010) propose that historically repressed groups have a lesser willingness to punish violators in general. Culture might create differences between the studies; India's cast system induces a more pronounced status hierarchy and may therefore repress the decision to punish by low status individuals more than the historical division between nobility and commoners in Sweden. Even though the Swedish nobility lost its privileges more than a decade ago one could speculate that the punishment specific discrimination is due to historic power inequalities. The decision to

punish an individual of higher status may entail a larger risk of retaliation than the decision not to give. Speculating further, this fear of retaliation may have been internalized as differences in the penalty scale for a specific norm violation depending on social status. The result in Lieberman and Linke (2004) as well as the fairness judgements in our study supports the suggestion that the moral judgment of a norm transgression is stable across social categories. Further Fehr et al. (2010) do not differentiate between men and women, which diminishes the comparability between the two studies.

Our study shows a surprisingly large effect of social status on punishment behavior, underlining the importance of social status as a modulator of behavior in male interactions. By guiding appropriate behavior, knowledge of status relations is an important key to successfully navigate in human societies. Future research is needed concerning various types of social status and its implications for economic decision making in different situations.

Experiment instructions

Instructions for participant A.

Welcome to this study in economics!

Please read the following instructions carefully. Depending on how you and your counterparts decide, you can earn money in addition to the 50 SEK you earn by participating. Therefore, it is important that you read and follow the instructions.

Please do not talk during the study. If you have any questions, raise your hand and we will come to answer your question.

Throughout this study you will use Swedish crowns. The study comprises three types of participants: Participants A, participants B and participants C. **You are a participant A.** During the study, you will interact with one randomly assigned participant B and one randomly assigned participant C.

Specific Instructions for the Experiment Procedure

Stage one

In the first stage, participants A are the sole decision-makers. As a participant A you have got an endowment of 100 SEK. Participant C gets 50 SEK, and participant B gets no endowment. We ask you to decide how many of the 100 SEK that you wish to assign to participant B. You can give participant B a number of SEK between 0 and 50 in a multiple of tens, i.e. 0, 10, 20, 30, 40, or 50 SEK. If, for example, you grant participant B 40 SEK, your income at the end of stage one will amount to 60 SEK, and participant B's income will amount to 40 SEK. If you accord her/him 10 SEK, your income will be 90 SEK, and the income of participant B will be 10 SEK at the end of stage one. If you grant B 0 SEK, your income at the end of stage one will amount to 100 SEK while participant B's equals 0 SEK.

Stage two

In stage two, only participants C have a decision to make. Participant C can pay to deduct money from your payoff. Each SEK charged to you as participant A diminishes your income by 3 SEK, and participant C's income is reduced by 1 SEK. Participant C can deduct a number of SEK between 0 and 50. Suppose participant C deducts 2 SEK: your income will then be reduced by 6 SEK while participant C's income will be reduced by 2 SEK. If participant C deducts 19 SEK to you, your income diminishes by 57 SEK and participant C's income is reduced by 19 SEK. Participant C takes her or his decision before knowing your decision, and hence answers how they would like to allocate their money for every possible decision you can make.

This is how we calculate participants A's, B's, and C's respective incomes:

Participant A's income amounts to

- + 100 SEK (participant A's endowment)
- number of SEK assigned to participant B by participant A
- 3 times the number of deduction SEK transferred to participant A by participant C

Participant B's income amounts to

- + number of SEK assigned to participant B by participant A

Participant C's income amounts to

- + 50 (participant C's endowment)
- number of deduction SEK charged participant A by participant C

Please note that your earnings may be negative, in which case the SEK will be deducted from your participation payment.

Control Questions

It is important that all participants have understood the rules of the game. Therefore we ask you to answer the following control questions. When you have finished, signal to us by raising your hand.

A. Participant A assigns 0 SEK to participant B.

a) Participant C charges participant with 0 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

b) Participant C charges participant A with 30 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

2. Participant A assigns 40 SEK to participant B.

a) Participant C charges participant A with 0 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

b) Participant C charges participant A with 15 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

Decision sheet participant A.

Below we ask you to decide how much you want to transfer to participant B. We also ask you to give us your best estimation of C's decision. This estimate is to be made for every possible decision you can make. Enter your estimates below on this sheet. In the box to the right of the number 0, you enter the number of SEK you believe participant C transfers to you in the event that you grant participant B 0 SEK. In the box beside the number 10 you enter the number of SEK you believe participant C transfers to you if you choose to grant B 10 SEK, and so on.

Your decision

You may transfer 0, 10, 20, 30, 40, or 50 SEK to participant B

How many SEK do you want to transfer? _____.

How do you believe is participant C going to decide?

Number of SEK you grant B	Number of SEK participant C transfers to you
0	
10	
20	
30	
40	
50	

When you have taken your decisions, please turn the page and answer a few survey questions.

Survey questions for participant A

1. *What are you studying?* _____

2. *I am a* *woman* ☐ *man* ☐

3. *I am* _____ *years old.*

4. *What do you think is a fair allocation of the 100 SEK?*

5. *What is the reason behind the decision you made?*

Instructions for participant B.

Welcome to this study in economics!

Please read the following instructions carefully. Depending on how you and your counterparts decide, you can earn money in addition to the 50 SEK you earn by participating. Therefore, it is important that you read and follow the instructions.

Please do not talk during the study. If you have any questions, raise your hand and we will come to answer your question.

Throughout this study you will use Swedish crowns. The study comprises three types of participants: Participants A, participants B and participants C. **You are a participant B.** During the study, you will interact with one randomly assigned participant A and one randomly assigned participant C.

Description of the two parts of the study

Stage one

In the first stage, participants A are the sole decision-makers. At the beginning of stage one, participants A get an endowment of 100 SEK. Participants C get an endowment of 50 SEK, whereas you as a participant B get no endowment. Participant A must decide how many of her/his 100 SEK s/he wishes to assign to you. S/he can transfer to you a number of SEK between 0 and 50 in a multiple of tens, i.e. 0, 10, 20, 30, 40, or 50 SEK. If, for example, participant A grants you 40 SEK, her/his income at the end of stage one will amount to 60 SEK, and your income will amount to 40 SEK. If s/he accords you 10 SEK, her/his income will be 90 SEK, and your own income will be 10 SEK. If s/he grants you 0 SEK, her/his income, at the end of stage one will result in 100 SEK, and your own income will result in 0 SEK.

Stage two

In stage two, only the participants C have a decision to make. Participant C can pay to deduct money from A. Each SEK charged to participant A diminishes A's income by 3 SEK, and participant C's income is reduced by 1 SEK. Participant C can deduct a number of SEK between 0 and 50. Suppose participant C charges 2 SEK: A's income will then be reduced by 6 SEK while participant C's income will be reduced by 2 SEK. If participant C deducts 19 SEK to A, A's income diminishes by 57 SEK and participant C's income is reduced by 19 SEK. Participant C takes her or his decision before knowing A's decision, and hence answers how they would like to allocate their money for every possible decision A can make.

This is how we calculate participants A's, B's, and C's respective incomes:

Participant A's income amounts to

- + 100 SEK (participant A's endowment)
- number of SEK assigned to participant B by participant A
- 3 times the number of deduction SEK transferred to participant A by participant C

Participant B's income amounts to

- + number of SEK assigned to participant B by participant A

Participant C's income amounts to

- + 50 (participant C's endowment)
- number of deduction SEK charged participant A by participant C

Control Questions

It is important that all participants have understood the rules of the game. Therefore we ask you to answer the following control questions. When you have finished, signal to us by raising your hand.

A. Participant A assigns 0 SEK to participant B.

a) Participant C charges participant with 0 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

b) Participant C charges participant A with 30 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

2. Participant A assigns 40 SEK to participant B.

a) Participant C charges participant A with 0 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

b) Participant C charges participant A with 15 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

Decision sheet participant B.

Below we ask you to estimate the other participants' decisions. This estimate is to be made for every possible decision A and C can make. Enter your estimates below on this sheet. In the box to the right of the number 0, you enter the number of SEK you believe participant C transfers to A in the event that A grants participant you 0 SEK. In the box beside the number 10 you enter the number of SEK you believe participant C transfers to A if A chooses to grant you 10 SEK, and so on.

Your estimation

A may transfer 0, 10, 20, 30, 40, or 50 SEK to you
How many SEK do you think A transfers? ..

How do you believe is participant C going to decide?

Number of SEK participant A grants you	Number of SEK deducted by participant C
0	
10	
20	
30	
40	
50	

When you have estimated the other participants' behavior, please turn the page and respond to a few survey questions.

Survey questions

1. What are you studying? _____

2. I am a woman ☐ man ☐

3. I am _____ years old.

4. How do you think that your average monthly income relates to the average student?

_ Below the average _ Close to average _ Above the average _ Don't know

4. How do you think that your wealth relates to the average student?

_ Below the average _ Close to average _ Above the average _ Don't know

5. What do you think is a fair allocation of the 100 SEK?

Instructions for Participants C

Welcome to this study in economics!

Please read the following instructions carefully. Depending on how you and your counterparts decide, you can earn money in addition to the 50 SEK you earn by participating. Therefore, it is important that you read and follow the instructions.

Please do not talk during the study. If you have any questions, raise your hand and we will come to answer your question.

Throughout this study you will use Swedish crowns. The study comprises three types of participants: Participants A, participants B and participants C. **You are a participant C.** During the study, you will interact with one randomly assigned participant B and one randomly assigned participant C.

Description of the two parts of the study

Stage one

In the first stage, participants A are the sole decision-makers. At the beginning of the stage, participant A gets an endowment of 100 SEK. You as a participant C get an endowment of 50 SEK. Participant B gets no endowment. Participant A must decide how many of her/his 100 SEK s/he wishes to assign to participant B. S/he can transfer to participant B a number of SEK between 0 and 50 in a multiple of tens, i.e. 0, 10, 20, 30, 40, or 50 SEK. If, for example, participant A grants participant B 40 SEK, her/his income at the end of stage one will amount to 60 SEK, and participant B's income will amount to 40 SEK. If s/he grants participant B 10 SEK, her/his income will be 90 SEK, and participant B's income will be 10 SEK at the end of stage one. If s/he grants participant B 0 SEK, her/his income, at the end of stage one, will result in 100 SEK, and participant B's own income will result in 0 SEK.

Stage two

In stage two, you, as participant C, are the only one to make a decision. You can pay to deduct SEK from participant A. Each SEK you deduct from participant A diminishes your income by 1 SEK and participant A's income by 3 SEK. You can assign any number of SEK between 0 and 50. Suppose you deduct 2 SEK to participant A, your income will be reduced by 2 SEK, and participant A's income will be reduced by 6 SEK. If you assign 19 SEK to participant A, your income is diminished by 19 SEK and participant A's income is reduced by 57 SEK.

This is how we calculate participants A's, B's, and C's respective incomes:

Participant A's income amounts to

- + 100 SEK (participant A's endowment)
- number of SEK assigned to participant B by participant A
- 3 times the number of deduction SEK transferred to participant A by participant C

Participant B's income amounts to

- + number of SEK assigned to participant B by participant A

Participant C's income amounts to

- + 50 (participant C's endowment)
- number of deduction SEK charged participant A by participant C

Control Questions

It is important that all participants have understood the rules of the game. Therefore we ask you to answer the following control questions. When you have finished, signal to us by raising your hand.

A. Participant A assigns 0 SEK to participant B.

a) Participant C charges participant with 0 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

b) Participant C charges participant A with 30 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

2. Participant A assigns 40 SEK to participant B.

a) Participant C charges participant A with 0 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

b) Participant C charges participant A with 15 SEK deduction.

What is participant A's income? _____

What is participant B's income? _____

What is participant C's income? _____

A: _____

B: _____

Decision sheet participant C.

In the first part participant A decides how many SEK to give to B. In the second part you decide how many SEK to deduct. We ask you to state your decision for every possible decision that A may make. In the box to the right of the number 0, you enter the number of SEK you want to transfer to participant A in the event that A grant participant B 0 SEK. In the box beside the number 10 you enter the number of SEK you want to transfer to Participant A in case s/he chooses to transfer 10 SEK to B, and so on.

Please determine the number of SEK to deduce, if any, you transfer to participant A.

Number of SEK participant A grants participant B	Number of SEK you transfer to participant A
0	
10	
20	
30	
40	
50	

When you have taken your decision, please turn the page and respond to a few survey questions.

Survey questions

1. What are you studying? _____

2. I am a woman ☐ man ☐

3. I am _____ years old.

4. How do you think that participant A's income relates to the average student?

_ Below the average _ Close to average _ Above the average _ Don't know

5. How do you think that participant A's wealth relates to the average student?

_ Below the average _ Close to average _ Above the average _ Don't know

6. How do you think that your average monthly income relates to the average student?

_ Below the average _ Close to average _ Above the average _ Don't know

7. How do you think that your wealth relates to the average student?

_ Below the average _ Close to average _ Above the average _ Don't know

8. What do you think is a fair allocation of the 100 SEK?

9. What is the reason behind the decision you made?

Appendix

Descriptive statistics

Table 1a. Descriptive statistics.

Variable	n	Mean	p50	Sd	Min	Max
Female TP	118	0.53	1	0.50	0	1
Female R	118	0.56	1	0.50	0	1
Female D	118	0.51	1	0.50	0	1
Nobel women	118	0.27	0	0.45	0	1
Nobel men	118	0.25	0	0.43	0	1
Common women	118	0.24	0	0.43	0	1
Common men	118	0.25	0	0.43	0	1
Level 0	118	16.94	16.5	14.29	0	50
Level 10	118	13.11	13	11.55	0	40
Level 20	118	9.88	10	9.19	0	40
Level 30	118	6.38	5	7.38	0	40
Level 40	118	3.22	0	5.08	0	30
Level 50	118	0.93	0	4.06	0	30
Punishment	118	0.73	1	0.45	0	1
Fairness	109	0.82	1	0.39	0	1
Age	118	25.88	24	8.33	17	71

Descriptive statistics of all variables included in our analysis. Level 0-50 indicates the actual level of punishment at each transfer level. Punishment and Justice are dummy variables; Punishment takes the value 1 when punishment was exerted at any level and 0 otherwise, and Justice takes the value 1 if a 50/50 split of the initial money was indicated as the fair division and 0 otherwise.

Table 1b. Sample size and attrition.

Sample	TP	R
Full sample	132	132
Males	59	52
Females	73	73
Attrition	14	11
Males	7	5
Females	7	6
Total	118	121

Recipient attrition refers to the case of recipients who were not able to answer either the control questions correctly, or who did not state beliefs for all alternatives elicited through the strategy method. In these cases we used their names on the third parties decision sheets, but dropped them when estimating expected proportion and level of punishment.

Proportion of punishment

Table 1c. Proportion of punishment.

Punishment proportions	All	Men	Women
Nw	0.69	0.57	0.78
Cw	0.61	0.54	0.67
Nm	0.72	0.58	0.82
Cm	0.90	0.88	0.92
Punishment proportions	P-value non parametric (ch2)	P-value parametric (prtest)	
Cm vs Nw	0.05	0.05	
Cm vs Cw	0.01	0.01	
Cm vs Nm	0.09	0.09	

Proportion of actual punishment by dictator characteristics and third party gender. NW=noble female dictators, CW=common male dictators, NM=noble male dictators and CM=common male dictators.

Table 1d. Expected vs. actual punishment (proportion and level)

Punishment proportions	Expected	Actual	P-value non-parametric (ch2)	P-value parametric (prtest)
0	0.61	0.72	0.10	0.07
10	0.68	0.71	0.58	0.57
20	0.67	0.71	0.49	0.48
30	0.63	0.63	1.00	0.99
40	0.50	0.49	1.00	0.95
50	0.28	0.11	<0.01	<0.01
Punishment Level	Expected	Actual	P-value non-parametric (MW)	P-value parametric (ttest)
0	14.8	16.9	0.19	0.27
10	13.3	13.1	0.93	0.89
20	11.2	9.9	0.70	0.32
30	9.3	6.4	0.13	0.02
40	6.9	3.2	0.94	<0.01
50	5.2	0.9	<0.01	<0.01

Table 2a. Punishment level of noble and common dictators.

Transfer level	Av. Noble	Av. common	Difference	P-value non-parametric (MW)	P-value parametric (ttest)	N
0	15.4	18.6	3.3	0.23	0.22	61, 57
10	11.6	14.7	3.1	0.15	0.14	61, 57
20	9.0	10.8	1.8	0.26	0.29	61, 57
30	5.8	7.0	1.3	0.36	0.35	61, 57
40	3.1	3.4	0.3	0.65	0.76	61, 57
50	1.0	0.9	-0.1	0.85	0.89	61, 57
Total	45.8	55.4	9.6	0.24	0.26	61, 57
Total -50	44.8	54.5	9.7	0.24	0.24	61, 57
total -40	41.8	51.2	9.4	0.22	0.21	61, 57

Table 2b. Punishment level of female and male dictators.

Transfer level	Av. Women	Av. Men	Difference	P-value non-parametric (MW)	P-value parametric (ttest)	N
0	15.0	19.0	4.0	0.04	0.13	60,58
10	11.4	14.9	3.5	0.03	0.10	60,58
20	8.7	11.1	2.4	0.03	0.15	60,58
30	5.8	6.9	1.1	0.05	0.41	60,58
40	3.1	3.3	0.2	0.04	0.85	60,58
50	1.2	0.6	-0.6	0.15	0.44	60,58
Total	45.2	55.9	10.7	0.03	0.21	60,58
Total -50	44.0	55.2	11.2	0.03	0.17	60,58
Total -40	40.9	51.9	11.1	0.03	0.14	60,58

Table 2c. Punishment by dictator category.

Transfer level	CM	NW	CW	NM	P-value non-parametric (MW)	P-value parametric (ttest)	N
0	21.3	14.2	15.9	16.7	0.03, 0.06, 0.20	0.05, 0.16, 0.18	29, 32, 28, 29
10	17.8	11.3	11.5	12.0	0.01, 0.02, 0.03	0.03, 0.04, 0.03	29, 32, 28, 29
20	12.9	8.8	8.6	9.3	0.03, 0.02, 0.10	0.08, 0.08, 0.09	29, 32, 28, 29
30	8.4	6.0	5.6	5.4	0.07, 0.03, 0.08	0.22, 0.17, 0.06	29, 32, 28, 29
40	4.0	3.5	2.6	2.6	0.10, 0.02, 0.13	0.71, 0.32, 0.12	29, 32, 28, 29
50	0.7	1.3	1.1	0.6	0.39, 0.43, 0.74	0.53, 0.69, 0.94	29, 32, 28, 29
Total	65.1	45.1	45.4	46.6	0.02, 0.02, 0.08	0.02, 0.12, 0.07	29, 32, 28, 29
Total -50	64.5	43.8	44.3	46.0	0.05, 0.02, 0.07	0.02, 0.10, 0.07	29, 32, 28, 29
Total -40	60.5	40.3	41.6	43.4	0.02, 0.02, 0.08	0.02, 0.09, 0.07	29, 32, 28, 29

NW =Noble women, CW=common women, NM=noble men, and CM=common men. The variable “Total -50” compounds punishment on all levels except level 50. The variable “Total -40” compounds punishment on all levels except level 50 and level 40. Sample size per group is reported in the order NW, CW, NM, CM. P-values indicate the probability of equal punishment between common men and the other categories respectively (noble women, common women and noble men).

Table 2d. Female third party punishment by dictator category.

Transfer level	CM	NW	CW	NM	P-value non-parametric (MW)	P-value parametric (ttest)	N
0	17.5	15.3	17.5	17.3	all >0.2	all >0.2	18, 15, 17, 13
10	15.8	12.9	12.3	13.2	all >0.2	all >0.2	18, 15, 17, 13
20	11.2	9.5	9.6	10.6	all >0.2	all >0.2	18, 15, 17, 13
30	6.6	6.4	6.5	6.4	all >0.2	all >0.2	18, 15, 17, 13
40	3.8	2.5	3.8	2.7	all >0.2	all >0.2	18, 15, 17, 13
50	0.7	0	2.1	0.8	all >0.2*	all >0.2*	18, 15, 17, 13
Total	55.6	46.6	51.8	50.9	all >0.2	all >0.2	18, 15, 17, 13
Total -50	54.9	46.6	49.7	50.1	all >0.2	all >0.2	18, 15, 17, 13
Total -40	51.1	44.1	45.9	47.4	all >0.2	all >0.2	18, 15, 17, 13

*The difference between the punishment of common men and noble women is significant at the level of 50 (MW: $p=0.04$, ttest: $p=0.07$). However, given the number of tests ran, we would expect some false positives to occur. NW=noble female dictators, CW=common male dictators, NM=noble male dictators and CM=common male dictators. Sample size per group is reported in the order NW, CW, NM, CM. P-values indicate the probability of equal punishment between common men and the other categories respectively (noble women, common women and noble men).

Table 2e. Male third party punishment by dictator category.

Transfer level	CM	NW	CW	NM	P-value non-parametric (MW)	P-value parametric (ttest)	N
0	24.3	12.7	14.1	15.8	0.04, 0.05, 0.13	0.02, 0.06, 0.10	14, 13, 12, 16
10	19.4	9.2	10.5	10.3	0.02, 0.04, 0.02	0.02, 0.05, 0.03	14, 13, 12, 16
20	14.4	7.8	7.5	7.5	0.04, 0.03, 0.04	0.06, 0.04, 0.03	14, 13, 12, 16
30	9.9	5.6	4.5	4.2	0.06, 0.04, 0.04	0.19, 0.04, 0.02	14, 13, 12, 16
40	4.2	4.9	1.4	2.4	0.21, 0.03, 0.21	0.79, 0.04, 0.19	14, 13, 12, 16
50	0.6	3.0	0.0	0.4	0.42, 0.37, 0.88	0.26, 0.38, 0.80	14, 13, 12, 16
Total	72.9	43.2	37.9	40.6	0.04, 0.02, 0.05	0.11, 0.04, 0.04	14, 13, 12, 16
Total -50	72.3	40.2	37.9	40.2	0.04, 0.02, 0.05	0.06, 0.04, 0.03	14, 13, 12, 16
Total -40	68.1	35.4	36.5	37.8	0.03, 0.03, 0.04	0.03, 0.04, 0.03	14, 13, 12, 16

NW =Noble women, CW=common women, NM=noble men, and CM=common men. The variable “Total - 50” compounds punishment on all levels except level 50. The variable “Total -40” compounds punishment on all levels except level 50 and level 40. Sample size per group is reported in the order NW, CW, NM, CM. P-values indicate the probability of equal punishment between common men and the other categories respectively (noble women, common women and noble men).

Dictator game - descriptive statistics

Table 3a. Descriptive statistics dictator game.

Variable	N	Mean	Median	Sd	Min	Max
Common name	31	65.8	50	20.6	50	100
Noble name	28	63.2	50	21.6	50	100
Total	59	64.6	50	21.0	50	100

Table 3b. Giving by recipient category.

	Av. Noble	Av. common	P-value non-parametric (MW)	P-value parametric (ttest)	N
Level of giving	63.2	65.8	0.28	0.64	28,31
Proportion of giving	.77	.78	0.58	0.92	28,31

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