Rank Preserving Preferences

Authors: Xinyue Zhou[1,] Benjamin Ho[2], Stephan Meier[3], Wenwen Xie[1]

Affiliations:

[1] Department of Psychology, Sun Yat-Sen University, Guangzhou 510275, China.

[2] Department of Economics, Vassar College, Poughkeepsie, NY 12604, USA.

[3] Graduate School of Business, Columbia University, New York, NY 10027, USA.

Abstract:

Hierarchies are stable institutions both within organizations and in society at large. While we know people work to maintain their own status in a hierarchy, and institutions exist to preserve the rank of those at the top, little has been done to measure the preference individuals have for preserving the hierarchical rank ordering of others. Using an original game we call the *redistribution game,* we show that people tolerate higher inequality in order to preserve pre-existing rank orders of endowments. While a majority will accept redistributive transfers in order to reduce inequality, the proportion of subjects who reject the redistributive transfer increase by 31 percent if the transfer reverses the ordering. Controlling for factors like inequality aversion or loss aversion, we attribute the difference to *rank preserving preferences* (RPP). These results have implications for understanding why we tolerate inequality, and for explaining hierarchy and promotion structures within organizations.

Keywords: rank, hierarchy, social preference, inequality, redistribution

Meddling and exchange among these three classes is the greatest harm that can happen to the city and would rightly be called the worst evil one could do to it. – Plato

Let the ruler be a ruler, the subject a subject, the father a father, the son a son. – Confucius

1. Introduction

Hierarchy and status are a natural part of how human organizations are organized, from class systems and social structures, to the organizations of firms. These hierarchies are surprisingly stable considering that those at the lower end often would prefer to get to the top. While institutional systems that ensure the preservation of these hierarchies have been put forward and examined (Marx 1846/1970; Weber 1922/1968; Durkheim 1964), we propose the existence of an innate social preference for the preservation of hierarchy. Past experiments have established that people have preferences for altruism (Fehr and Fischbacher 2004), that people care about preserving their own status (Frank 1993; Kuziemkoet al. 2014; Veblen 1899/1994), that people care about losses and gains rather than levels of utility (Kahneman and Tversky 1979), and that people care about horizontal equity (Stiglitz 1982; Feldstein 1976). Here we follow this past work on social preferences by introducing a novel experimental game we call the *redistribution game* to identify a preference to preserve existing hierarchy.

The decision makers in the redistribution game act as a third-party spectator of two others drawn from the same subject pool but have no role in the game. In this sense, we can think of the decision maker as a voter, approving or rejecting a redistribution policy that does not affect her directly. The others have been randomly endowed with unequal amounts of money, for example, 4 tokens for one, and 1 token for the other. The decision maker is given a single task, they are asked to either approve or reject the redistribution of a specified amount from the person with the greater allocation to the person with the lesser allocation. In the above example, when asked to redistribute 1 token from richer to poorer, which leaves a final distribution of 3 and 2, we find that most decision makers approve. However, when asked whether they would redistribute 2 tokens, which leaves a final distribution between the two of 2 and 3, we find that the majority of decision makers reject the transfer. Since the two others are anonymous and unaware of their initial allocations, the choice to redistribute either 1 or 2 tokens is exactly the same in terms of ultimate outcomes associated with the choice to accept or reject. Accept leads to a 2-3 distribution, rejection leads to 1-4. Any teleological utility function based only on final payoffs alone would predict no difference between redistributing either one token or two. We argue that the reason for this difference can be attributed to *rank preserving preferences* (HPP).

The results of the paper show that in specifications which represent identical choice problems in terms of the set of possible payoffs in a subject's choice set, subjects reject the choice problem that creates a rank reversal 31% more often. We decompose this difference between the effect of the reversal itself and the subjects' aversion to larger transfer payments, and find that the reversal itself increases rejection rates by 13%. We find that the weight decision makers put on reversals is decreasing for larger transfer payments and decreasing when status quo inequality is higher. We also find surprising consistency of our measure across different demographic groups, although those from higher socioeconomic statuses (SES) are more averse to hierarchy changes. Our design includes other choice variants to rule out other explanations such as loss aversion or property rights, and to calibrate the effect of rank preservation against preferences over inequality. In related work, we demonstrate that these preferences are universal across different populations, from Western students to Tibetan farmers, and demonstrate how these preferences develop in children between the ages of 3 and 10 (Xie et al. 2014). We found that inequality aversion develops first, between the ages of 4 and 5, while rank preservation develops between the ages of 6 and 7. These patterns track the development of executive function and awareness of social rank in the childhood development literature. Here, we relate these preferences to existing social preferences like social comparison and altruism and to principles of justice like horizontal equity, and show that people behave consistently with rank preserving preferences across different elicitation devices and across different variants of the game.

Our paper contributes to at least three strands of literature:

First, we extend the literature on social preferences that estimate how much people value features like altruism, equity or fairness in social choice problems. We find that even after controlling for those other aspects of choice, people also care about rank preservation. This social preference for rank preservation relates to prior work on evolution in the animal kingdom where we know that social species like wolf packs have an evolutionary imperative to respect established pecking orders to avoid intragroup conflict (Maynard-Smith 1982). Our paper shows that humans behave in a similar manner.

Second, our work relates to the cognitive theories in the psychology literature on organizations and institutions. System justification theory (Jost and Banaji 1994) argues people have an innate preference to support and maintain the current social system they live in, and are resistant to potentially violent revolution. This is related to the theory of compensatory control (Friesen et al. 2014), and to studies in organizations which find that imposing hierarchy can increase the effectiveness of teams (Ronay et al. 2012). Our paper shows that changes in hierarchy causes disutility in individuals in comparable size to increases in inequality, suggesting a rationale for promotion decisions based on tenure, rather than a promotion system based on merit. Furthermore, salary increases may be constrained by whether giving somebody a raise would shift the rank order of salaries within the company.

Finally, our paper contributes to the literature on inequality. The optimal tax literature has historically used the concept of horizontal equity as a moral constraint (Feldstein 1976), i.e. the design of tax systems should not create new winners and losers even if doing so would be Pareto inefficient (Stiglitz 1982). Here we provide experimental evidence and a way to measure preferences for horizontal equity, which would allow tax designers to weight breaches of horizontal equity with increasing tax efficiency. A preference against redistribution for the sake of rank preservation also has broader consequences on policies that address inequality, and on understanding popular resistance to change. At the extreme, big shifts in rank are often associated with violent revolutions, but our results can help predict voter preferences over government transfer policies that affect inequality especially for voters at higher SES levels. In particular, those at higher SES levels may respond very differently to transfer programs that are framed as transfers from the rich to the poor, rather than transfers from an abstract third party to the poor.

In the following section, we explain the details of our experimental design and how we counter-balance our choice problems to account for alternative explanations. We introduce a theoretical framework of rank preserving preferences to use as point of comparison with existing models of reference dependence and fairness, and to describe our empirical strategy and hypothesis. We then present the results. We conclude with broader implications for political change and corporate organization.

2. Experimental Design

2.1. Economic Games

We implemented two economic games: (1) the redistribution game and the (2) distribution game. In both games, the decision maker is a spectator who decides on the ultimate payoffs of two anonymous others.

(1) *Redistribution Game*. The main results in this paper are based on the redistribution game. The design of the redistribution game involves presenting the decision maker with sets of related choice problems to either accept or reject a transfer between two anonymous others. We used 80 different choice problems for each decision maker, randomly assorted so that their relationships were not apparent. In every choice problem, decision makers were presented with two anonymous other people in the subject pool,[1] told that each was randomly allocated the initial endowment as seen on the screen, and given the choice to either accept or reject the redistributive transfer from the higher endowment to the lower endowment (the side that was higher or lower was also randomized). The transfer was always from the higher to the lower. The people in the choice problem were not decision makers themselves, nor were they informed of their initial endowment or the payoffs of the other person. They were only informed about their own final payoff and only if they were the subjects of a choice task that was randomly selected to be paid. Instructions can be found in the appendix.

[Figure 1 about here]

[1] Pictures of the intended recipients drawn from the lab's subject pool were included to help the decision maker recognize these choices were affecting real people, but the people themselves were not known to the decision maker. Pictures were fully randomized, assessed on attributes like attractiveness, and tested to see if the characteristics of the person in the picture affected choice. They did not.

The structure of the different choice problems were generated from sets of four. Figure 1 shows screenshots four choice problems from one choice grouping. In each group of four, one choice problem contains a transfer size that would reverse the order, labeled Type I in the figure.

For utility functions/preferences that depend only on final realized payoffs, the choice presented in Type I and Type II queries are identical, since the people are anonymous. Both the status quo and potential realized distribution payoffs if the transfer is accepted are identical; the only difference in outcomes is that in the Type I choice task, the rankings of the two would be reversed between how they were endowed and their final payoff. Therefore, we could interpret any difference in behavior between Type I and Type II as a measure of rank preservation.

However, while the difference between Type I and Type II are identical in terms of the distribution of realized outcomes, they also differ in terms of the transfer size. Therefore, the Type III and Type IV tasks echo Type I and Type II but with the transfer size fixed. Also Type III and Type IV are designed so that neither choice involves a rank reversal, allowing us to isolate the effect of transfer size. We provide mean differences and regression based parameter estimates to test the fundamental premise of this paper, that after controlling for final outcomes and changes in payoffs, people have a preference to preserve existing rank.

The main hypothesis we seek to test is that after controlling for all other aspects of the choice problem, subjects are more likely to reject redistributive transfers that reverse the established rank ordering.

It is worth noting in our design that the initial endowments are randomly assigned. There is little doubt that altering how the endowments were created would change our estimates. For example, it is likely that if people had to earn their endowment, the rank preserving preference would be stronger (as in Erkal et al. (2011)). We chose random assignment to find the baseline rank preserving preference. It would certainly be interesting to see the effect of alternative allocation mechanisms, we leave this for future work.

(2) *Distribution Game*. To test the robustness of the redistribution game, we consider a variant of it. The *distribution game* is identical to the redistribution game, except instead of taking funds from the richer and transferring them to the poorer, the distribution game simply takes additional

funds from the experimenter and transfers them to the poorer. This variant allows us to control for the spectator's aversion to take away from someone's initial endowment.

2.2. Subject Pool and Procedures

We obtained data from three subject pools using different elicitation environments, and obtained broadly similar results. Part of the intent was to demonstrate this effect across different age groups and ethnicities and elicitation methods so we used a non-traditional subject pool. See Table 1 for summary statistics from our three sources of data.

[Table 1 about here]

One hundred and seven residents (47 females) in a city located in northern China were recruited to take part. Their age ranged from 18 to 73 (M = 36.43, SD = 13.76). A total of 31 Caucasian participants (8 females) were recruited on campus or from the International Youth Hostel in Guangzhou. Their age ranged from 18 to 58 (M = 25.1, SD = 7.03). All the participants read and signed the consent form before participation and they received a small gift for completing the experiment.

Prior to the experiment, participants read the instructions about the experiment and on how to make their decisions. Throughout the instructions it was emphasized to the participants that their decisions would make a difference in real life because the experimenter would select some trials and allocate money to the persons in the pictures according to participants' decisions. Participants completed the economic games on the computer. They made yes or no decisions on each of 160 trials in total on the computer, 80 trials for the redistribution game and the other 80 trials for the distribution game. The order of the game was counterbalanced. Also the advantaged side and disadvantaged side are counterbalanced to be placed on the left side of the screen or on the right side. All the trials for each game are randomized in order. Participants did ten practice trials for each game before the game started.

For the online sample, participants were recruited using the online labor market Amazon Mechanical Turk (AMT). We posted a task that required workers to complete an externally hosted experiment in exchange for $0.50. The task was visible only to workers with an acceptance rate greater than 95%. 100 workers (52 females) took part and completed the experiment. Their age ranged from 19 to 46. Racially, the sample is predominantly Indian (81%), the remaining includes racial groups of Caucasian (17%) as well as bi-racial/multicultural (2%).

The online version of the game was very similar to the laboratory version. Participants made yes or no decisions on each of 160 trials in total and 80 trials for the redistribution game. Before the experiment, they read the instructions which were the same as those in the laboratory version of the experiment.

Following both the lab and online experiments, participants completed a questionnaire containing four items for political attitudes (e.g., When it comes to politics, do you usually think of yourself as liberal, moderate, conservative, or something else? *1*= very liberal; *7*=very conservative) and interest in politics (Iyer et al 2012). We also measured participants' social economic status using MacArthur's SES ladder. In both, the lab and the online experiments, we selected at least one trial and assigned money to the person in the picture as suggested by the participants. Participants were informed about all those details.

3. Conceptual Framework and Hypothesis

We assume the following decomposition of utility that our decision makers confront when facing a choice problem in the redistribution game involving deciding the ultimate payoffs between two anonymous others, a and b:

$$U(a_q, a_r, b_q, b_r) = f(a_r, b_r) + g(a_r - a_q, b_r - b_q) + h(a_q, a_r, b_q, b_r)$$

Where a_q and b_q represent the status quo initial endowment for person a and person b, and a_r and b_r represent the realized payoff if the redistributive transfer is accepted or rejected.

The $f(a_r, b_r)$ term represents any social preference that depends only on realized payoffs. This can encompass most models of social preferences common in the literature such as Fehr-Schmidt (1999) or Charness-Rabin (2002) models of fairness or Becker's pure altruism (1974).

The $g(a_r - a_q, b_r - b_q)$ term covers any social preference that depends on the change of someone else's realized payoffs. This term captures hybrid models of preferences that combine loss aversion with some degree of empathy or altruism (loss aversion by itself would not come into play because the decision maker in our setup is a third-party and is not directly affected by the choice to accept or reject). For example, consider a loss-averse pure altruist whose utility is proportional to the utility of the two others in the choice problem. Or consider a pure altruist who believes the two others are loss averse (although in our experiment, the people in the problem never knew their initial endowment, so the losses are only in the mind of the decision maker). Both of these cases are captured by the g function. Alternatively, the g function can capture preference models that depend on impure altruism (Andreoni 1990) where an altruist cares about the amount given, rather than the outcome of the giving. Or, this term also captures some notion of property rights, where the decision maker is averse to taking what properly "belongs" to the better endowed party (Schnidler and Vadovic, 2011).

The f and g terms also captures any preferences over entitlements due to fairness norms so long as these norms depend only on final payoffs or changes in payoffs. For example, egalitarian fairness, libertarian fairness, and liberal egalitarianism (Konow, 2000; Capellen et al. 2007; Capellen et al 2013) would all predict fairness preferences for the redistribution game that depend only on final payoffs.

While many previous studies have focused on separately identifying these effects, our interest is in the final term, $h(a_q, a_r, b_q, b_r)$, which captures anything that is left. So long as these three terms are additively separable, the treatments included as part of the redistribution game allows us to completely control for any preferences that depend on f and g alone.

In this paper, we focus on one particular type of status quo dependent h function—decision makers are averse to payoff changes that reverse the rank ordering of other people. Specifically, define h as follows:

$$h(a_q, a_r, b_q, b_r) = \begin{cases} -\gamma & \text{if } (a_q > b_q \text{ and } a_r < b_r) \text{ or } (a_q < b_q \text{ and } a_r > b_r) \\ 0 & \text{otherwise} \end{cases}$$

Here we define rank preserving preferences (RPP) as having a constant disutility $-\gamma$ when there is a strict reversal of the social order. Our design precludes choices that involve changes between equal and unequal distributions out of a belief that people adhere strongly to an equality or 50-50 norm (Andreoni and Bernheim 2009), so we intentionally avoided those cases. Although the basic model will assume that the HPP coefficient γ does not depend on a_q, a_r, b_q, or b_r, we will test this explicitly in the robustness checks.

For convenience, our regression model will assume utility takes the following linear form which we will estimate using both linear and logit probability models:

$$U(a_q, y_r, b_q, b_r) = \alpha|y_r - z_r| - \beta[\max(0, a_r - a_q) + \max(0, b_r - b_q)] - \gamma \cdot \mathbb{1}_{reversal}$$

However, because all of our choice problems are counter-balanced by other choice problems which hold either outcomes or changes in outcomes constant, the functional form for the first two terms do not actually matter. Type I and Type II trials hold final outcomes constant between the choice of accept or reject, so the first term cancels out. Type III and Type IV trials match the transfer sizes of Type I and Type II trials, allowing us to subtract out the middle term effects. Thus, estimating the rank preservation coefficient, γ, on these four trial types allows us to uniquely identify the HPP. The main hypotheses we seek to test therefore is as follows:

Rank Preservation Hypothesis*: Third party decision makers are more likely to reject redistributive transfers that reverse the established rank order of individuals ceteris paribus (holding transfer size and the distribution of initial and final payoffs constant).*

4. Results

We present the results in multiple steps: We first show mean rejection rates for each type of transfer problem where we can see rank preservation just by comparing means. We then estimate the impact of rank reversals on rejection, controlling for all other attributes of the choice problem using regression analysis. We then consider two extensions of the model. First we consider individual differences in behavior, and consider how these preferences differ across subgroups and across individuals. Then we present results from the distribution game, to examine rank preservation in a game where the only loss to the wealthier individual is relative rank.

[Figure 2 about here]

Figure 2 shows the means and standard errors (clustered by subject) of whether subjects rejected a proposed redistribution, for each of the four types of choice problems. The overall height of each bar gives the overall rejection rate across our subject pool, but we subdivide each bar into sample group. While we find the same patterns across all sub-groups we will discuss sub-group differences. Recall that Type I is the only question type that involved a rank reversal. Comparing the difference in mean rejection rate between Type I and Type II (52% versus 21%, t-test $p < 0.001$) gives a quick sense of how much reversals matter. From this comparison, the 31% higher rejection rate allows us to easily reject the teleological hypothesis that decision makers care about realized payoffs alone. However, even though the choice set as defined by possible realized payoffs between accept and reject are identical between Type I and type II trials, there are two additional differences. Type I transfers involve a reversal while Type II transfers do not, but they also differ because Type II transfers involve a larger transfer amount.

From Figure 2, we can also get a sense of the aversion to larger transfers by comparing Type III and Type IV queries. Rejection rates for Type III queries are slightly but significantly higher than Type IV (26% versus 19%, t-test $p< 0.001$) even though Type III transfers reduce inequality more. To separately identify the effects of rank reversals by itself, we turn to our regression results.

Table 2 reports versions of our main specification where we regress the probability of rejecting the transfer on whether the transfer would lead to a reversal, on the size of initial inequality, on the size of final inequality, and on the size of the transfer.[3] In addition to OLS with fixed effects, we include marginal effects at the mean of a logit model[4], and specifications with question set fixed effects. All specifications cluster standard errors at the subject level and include elicitation method controls. All specifications yield a very consistently estimated 13% for our rank preservation coefficient. In other words, all else being equal, the presence of a transfer that would reverse the rank increases the rejection rate by 13%. Of the 31% mean difference in rejection rates observed in Figure 2, about 13% can be attributed to HPP, the remaining 19% is due to an aversion to larger transfer sizes, explainable either by loss aversion or some kind of respect for property rights.

To assess the relative importance, we can compare the HPP with the effect of the other parameters of the game. Recall that every transfer in the game reduces inequality. Therefore, each token of higher endowment inequality decreases rejection probabilities by 4.7%. Each token of post-distribution inequality (the inequality that would remain if the transfer is accepted) increases rejection probabilities by 3.1%. Subjects were also averse to larger transfer sizes,

---

[3] We pool the data from the three subject pools as regressions on each subject pool separately yielded the same results.

[4] We report logit here since we are essentially estimating the difference of two utility functions, but probit yields the same results.

consistent with some kind of property right to their initial endowment (Gächter and Riedl 2005; Schnedler and Vadovic 2011). Each additional token of transfer size increased rejections by 10-11%.

We can get a visual sense of the magnitudes of these coefficients by looking at Figure 2. The higher rejection rate of Type III queries relative to Type IV queries is due to the disutility from one token of transfer sizes (10-11%) outweighing the disutility from endowment and final inequality (4.7% and 3.1%). The gap between the rejection rate of Type I and Type II queries can be seen as the sum of the transfer size disutility (10-11%) plus the reversal aversion disutility (13%).

Effect size analysis using partial eta-squared coefficients (Cohen 1988) finds that accounting for reversals accounts for 9.1% of the variance in the data, compared to 16.5%, 7.4% and 18% for endowment size, final inequality and transfer size respectively.

We decompose the reversal disutility in Table 3. Columns 1 and 2 look at whether rank preservation varies as we vary other query parameters like endowment inequality or transfer size.[5] We find that rank preservation decreases by 1.2% for each unit of endowment inequality, and by 2.3% for each unit of transfer size. When inequality is higher, we worry less about reversals to rank. Similarly, when transfer sizes are larger, the transfer size becomes more salient, and therefore the rank reversal has less impact on our decisions.

[Table 3 about here]

Column 3 decomposes rank preservation by the subject demographics of gender, age and self-reported Socioeconomic Status (SES).[6] Only SES proves significant. Higher SES subjects exhibit greater preferences for rank preservation. The coefficient on reversal itself becomes insignificant—the reversal effect is captured entirely by the interaction term between reversal and SES. For each step up on the 10 point SES likert scale, rank preservation increases by 2.2%. The wealthier care much more about rank preservation than those at lower SES levels. We will find that this SES effect only matters when redistribution specifically takes away from the richer

[5] We cannot do the same for final inequality due to multi-collinearity.

[6] We lose some observations in columns 3 and 4 due to missing answers for questions about SES or Age or Gender.

party. Column 4 adds in interaction effects for self-reported political, social, and economic attitudes, but finds no significant impacts.

The design of our study allows us to isolate rank preserving preferences from alternate social preferences such as reference dependence, property rights, and loss aversion. Another possible alternate explanation is that subjects think about the transfer size as a percentage. So a transfer size of 2 tokens from the wealthier party who has 4 tokens, represents an effective "tax rate" of 50%. In our specifications, we control for transfer size in terms of levels. If reversals are correlated with the effective "tax rate" in a way that the level of the transfer does not completely control for, then perhaps the effect of reversals are spurious. However, re-running specifications that add a tax rate control have no significant effect on our estimated reversal coefficients.

To further check for the robustness of our estimates across different domains, we conduct two additional exercises: (1) We look at behavior in the distribution game and compare HPP estimates for various subsets of our sample for both games. (2) We estimate individual rank preserving coefficients for each subject in our sample, and we look at intra-subject consistency, both between the redistribution and the distribution game, and between two random subsets of questions within the redistribution game.

(1) As noted before, the distribution game is exactly the same as the redistribution game except that here the money to the lesser endowed person comes from the experimenter rather than the more highly endowed person. As before, questions are asked in sets of four where Types 1 and 2 differ in whether there is a reversal. And Types 3 and 4 control for differences in transfer size. The distribution game avoids the "property rights" concerns regarding the redistribution game. We are not "taking" money to make the distribution between the two more equal, instead the money comes in the form of "house money" from the experimenter.

After completion of the redistribution game, all subjects played 80 trials of the distribution game. See Appendix for details. Table 4 presents the same regression estimates. Here we find that most question parameters did not matter—transfers were generally always accepted, the only exception being transfers that would lead to a reversal.

(2) To compare behavior across the two games, we calculated rank preserving preferences using our base specification for different subsets across the two games (see Table 5).

While effect sizes are generally smaller for the distribution game, we find they largely move in the same direction. The one notable exception is SES. While higher SES individuals exhibit greater rank preserving preferences in the redistribution game, they exhibit less rank preservation in the distribution game. One way to think about this is that the rich dislike reversals of rank when the money comes from the rich, but are less perturbed by rank reversals if the money comes from somebody else. This difference in how different SES levels respond to rank reversals can explain our findings with regard to individual differences.

6. Discussion and Conclusions

The redistribution game offers a novel method of applying an experimental economic game to measure the minimal preference for preserving rank-order payoff hierarchy in an experimental setting. We fully expect that making initial endowments non-random, or increasing the social salience of the established rank ordering would lead to stronger observed preferences, but leave such modifications to future work. The experiment is designed to explicitly rule out any teleological theory of preferences that depends only on the final distribution of payoffs as is typical of most economic theories, and is able to control for alternate explanations based on size of the transfer.

In this analysis we introduce the redistribution and the distribution game as a way to measure one facet of people's innate preference for preserving the social order. Here we contribute to the experimental literature on distributional fairness (Charness and Rabin 2002; Fehr and Schmidt 1999) and in particular on third party preferences in public goods games (Bone, Silva, and Raihani, 2014), to examine how preferences for redistribution depends on its impact on existing rank orders. The prior literature on third party preferences has focused primarily on whether the third party will punish perceived unfair behavior. Here we are interested instead on how the third party balances preferences for equality, with preferences for stability.

Our work relates very much to the work on the importance of status, a literature that goes back to Adam Smith's Theory of Moral Sentiments (1759/1976) and Veblen's Theory of the Leisure Class (1899/1994), but has been examined in recent work such as Kuziemko et al. (2014), who finds that fear of losing status in five person experimental games can lead to those near the bottom to oppose redistributive transfers. In our study, people are not directly worried about losing their own status, instead they are concerned about disrupting the status of others. Thus rank preserving preferences can be explained by some combination of third party empathy for the loss of status felt by others, coupled with loss aversion for status, such that losses in status weigh are more costly than identical gains in status.

Our work does not allow us to identify the mechanism behind these preferences. The difference in how high SES subjects react to the redistribution game relative to the distribution game is suggestive. High SES people also like greater equality, so long as it does not come at the expense of those who are well off. However, it is notable that those who are of relatively lower socio-economic status (SES) in our subject pool still have fairly strong rank preserving preferences (11% compared to an overall rate of 13% for the entire subject pool). This preference for those at the bottom to support the rank ordering is supported by models from the animal kingdom. Maynard-Smith (1982) argues that many animals like wolf packs or chickens may have innate preferences to preserve the pecking order or *dominance-hierarchy* once it has been established in order to avoid in-group conflict.

In human systems, it was in Karl Marx' central thesis that economic systems develop to replicate existing power structures. Thus focus on this thesis in the social sciences has primarily looked at social and political institutions. Looking at preferences at the individual level to support established rank orderings is relatively rare. One exception is system justification theory (Jost et al. 2004) which shows that people tend to excessively justify the systems they find themselves living in. Similarly, the theory of compensatory control argues that if people's lives feel disordered or out of control, they seek the comfort of knowing they live in a more hierarchical system (Friesen et al. 2014). It is not surprising then that preferences for redistribution are tempered by concern over rank reversals. Many social movements are often motivated by desires for greater social justice, but support for social movements are tempered when overthrowing the existing power structures may lead to violence and destruction.

Rank preserving preferences also have implications for organizational structures. Such preferences may have explanatory power in terms of looking at promotion decisions and salaries. Raises and bonuses may be constrained to preserve the existing order, even if higher raises are justified. Rigid wage structures and fixed tenure based promotion paths may be the structures firms have used to limit hierarchical disputes.

Recent experimental and industry level research (Ronay et al. 2012; Anderson and Brown 2010) finds that hierarchical groups can be more effective at some tasks than groups with no hierarchical structure. Looking across industries, we may find the effect to be bigger or smaller depending on task type. Such research has also identified that status conflicts (Bendersky and Hays 2012) hurts performance and moderates the effect of task conflicts.

While the work presented here does not allow us to identify the impact of the mechanism behind the transfer, we are able to demonstrate that rank-order hierarchy is important enough for people to want to maintain it at the expense of other social goods like reduced inequality. Thus, we introduce the redistribution game to serve as a starting point for future work on rank preservation.

References:

Anderson C, Brown CE (2010) The functions and dysfunctions of hierarchy. *Res. Organ. Behav.* **30**: 55-89.

Andreoni J (1990) Impure altruism and donations to public goods: a theory of warm-glow giving. *Econ. J.* 464-477.

Andreoni J, Bernheim BD (2009) Social image and the 50–50 norm: A theoretical and experimental analysis of audience effects. *Econometrica*, **77**(5): 1607-1636.

Becker G (1974) A theory of social interactions. *J. Polit. Econ*. **82**(6): 1063-1093.

Bendersky C, Hays NA (2012) Status Conflict in Groups. *Organ Sci,* **23**(2): 323-340.

Bone J, Silva AS, Raihani NJ (2014) Defectors, not norm violators, are punished by third-parties. *Biol Lett-UK,* **10**(7):20140388.

Cappelen, Alexander W., Astri D. Hole, Erik Ø. Sørensen, and Bertil Tungodden (2007). The Pluralism of Fairness Ideals: An Experimental Approach. American Economic Review 97(3), 818-827.

Cappelen, Alexander W. , James Konow, Erik Ø. Sørensen, and Bertil Tungodden (2013). Just Luck: An Experimental Study of Risk Taking and Fairness. American Economic Review 103(4), 1398-1413.

Charness G, Rabin M (2002) Understanding social preferences with simple tests. *Q. J. Econ.* **117**(3): 817-869.

Cohen J (1988) *Statistical power analysis for the behavioral sciences (2nd ed).* (Lawrence Erlbaum, Hillsdale, NY).

Durkheim E (1964). *The Division of Labour in Society. (Simpson G Trans.)* (The Free Press, New York). Original work published 1893.

Erkal N, Gangadharan L, Nikiforakis N (2011) Relative Earnings and Giving in a Real-Effort Experiment. *Am. Econ. Rev.* **101**(7): 3330-3348.

Fehr E, Schmidt KM (1999) A theory of fairness, competition, and cooperation. *Q. J. Econ.* **114**(3): 817-868.

Fehr E, Fischbacher U (2004) Social norms and human cooperation. *Trends. Cogn. Sci.* **8**(4): 185-190.

Feldstein M (1976) Temporary Layoffs in the Theory of Unemployment. *J. Polit. Econ.* **84**(5): 937-957.

Friesen JP, Kay AC, Eibach RP, Galinsky AD (2014) Seeking structure in social organization: Compensatory control and the psychological advantages of hierarchy. *J. Pers. Soc. Psychol.* **106**(4): 590-609.

Gächter S, Riedl A (2005) Moral property rights in bargaining with infeasible claims. *Manage. Sci.* **51**(2): 249-263.

Iyer R, Koleva S, Graham J, Ditto P, Haidt J (2012) Understanding libertarian morality: The psychological dispositions of self-identified libertarians. *PloS one*, **7**(8): e42366.

Jost JT, Banaji MR, Nosek BA (2004) A decade of system justification theory: Accumulated evidence of conscious and unconscious bolstering of the status quo. *Polit. Psychol.* **25**(6): 881-919.

Jost JT, Banaji MR (1994) The role of stereotyping in system-justification and the production of false consciousness. *Brit. J. Soc. Psychol.* **33**(1): 1-27.

Konow, James (2000). Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions. American Economic Review 90(4), 1072-1091.

Marx K, Engels F (1970) *The German ideology.* (*Arthur CJ ed)*. (International Publishers, New York) Original work published 1846.

Ronay R, Greenaway K, Anicich EM, Galinsky AD (2012) The path to glory is paved with hierarchy: When hierarchical differentiation increases group effectiveness. *Psychol. Sci.* **23**(6): 669-677.

Schnedler W, Vadovic R (2011) Legitimacy of Control. *J. Econ. Manage. Strat.* **20**(4): 985-1009.

Smith A (1976) *The theory of moral sentiments. (Raphael DD, Macfie AL eds.)* (Clarendon Press, Oxford). Original work published 1790.

Smith JM (1982) *Evolution now: A century after Darwin*. (Freeman, San Francisco, CA).

Stiglitz JE (1982) Self-selection and Pareto efficient taxation. *J. Public. Econ.* **17**(2): 213-240.

Veblen T (1994) *The Theory of the Leisure Class: An Economic Study of Institutions*. (Penguin Books, New York) Original work published 1899.

Weber M (1968) *Economy and society; an outline of interpretive sociology*. (Bedminster Press, New York) Original work published 1922.

Xie W, Ho B, Stephan M, Zhou X-Y (2014) Inequality is here to stay: Innate Preference for Social Hierarchy Inhibits Wealth Redistribution. Working paper, Sun Yat-sen University, China.

Appendix

Instructions for lab participants:

In each trial, you will see two pictures of two real persons (Person A and B). Person A was allocated a certain amount of money and person B was allocated a certain different amount of money by computer. You have the option to transfer a fixed amount of money from the advantaged side to the disadvantaged side. Please keep in mind that there are no right or wrong answers——choose the option that you, for whatever reason, prefer most. If your choice is yes, please press the button ‘1’; if you choose not to make the transfer, please press the button ‘2’. Please keep in mind that your decision will make a difference in real life because we will select some trials and allocate money to these two persons according to your decision.

Instructions for Mturk participants:

In each trial, you will see two pictures of two real persons (Person A and Person B). You can see that Person A was allocated a certain amount of money and person B was allocated a certain amount of money by computer. You will be given an option to make a transfer from one person to another person. Please keep in mind that there are no right or wrong answers——choose the option that you, for whatever reason, prefer most. If you choose to make the transfer, please click "Yes". Otherwise, click "No". Please keep in mind that your decision will make a difference in real life because we will select some trials and allocate money to these two persons according to your decision.

List of all Choice Queries for the Redistribution Game

A Endow	B Endow	Transfer	A Endow	B Endow	Transfer	A Endow	B Endow	Transfer	A Endow	B Endow	Transfer
4	1	2	7	1	4	6	3	2	6	2	3
4	1	1	7	1	1	6	3	1	6	2	1
6	1	2	10	1	4	8	3	2	9	2	3
6	1	1	10	1	1	8	3	1	9	2	1
10	6	3	5	1	3	8	5	2	9	6	2
10	6	1	5	1	1	8	5	1	9	6	1
13	6	3	8	1	3	11	5	2	11	6	2
13	6	1	8	1	1	11	5	1	11	6	1
11	2	5	10	3	4	7	3	3	5	2	2
11	2	3	10	3	2	7	3	1	5	2	1
13	2	5	12	3	4	10	3	3	7	2	2
13	2	3	12	3	2	10	3	1	7	2	1
8	2	4	9	2	4	8	4	3	8	1	4
8	2	2	9	2	2	8	4	1	11	1	2
12	2	4	11	2	4	12	4	3	11	1	4
12	2	2	11	2	2	12	4	1	8	1	2
7	4	2	10	1	5	9	5	3	10	4	4
7	4	1	10	1	2	9	5	1	10	4	2
9	4	2	12	1	5	12	5	3	13	4	4
9	4	1	12	1	2	12	5	1	13	4	2

Figures

Figure 1: Screenshots from the Experiment

Four screenshots of related choice problems. Compare choice problem I and choice problem II. Both transfers represent identical choice problems in that both would lead to the same distribution of final payoffs if accepted, and the same distribution if rejected. However, a majority of people reject transfer I while a majority of people accept transfer II. Choice problems III and IV serve as controls for transfer size.

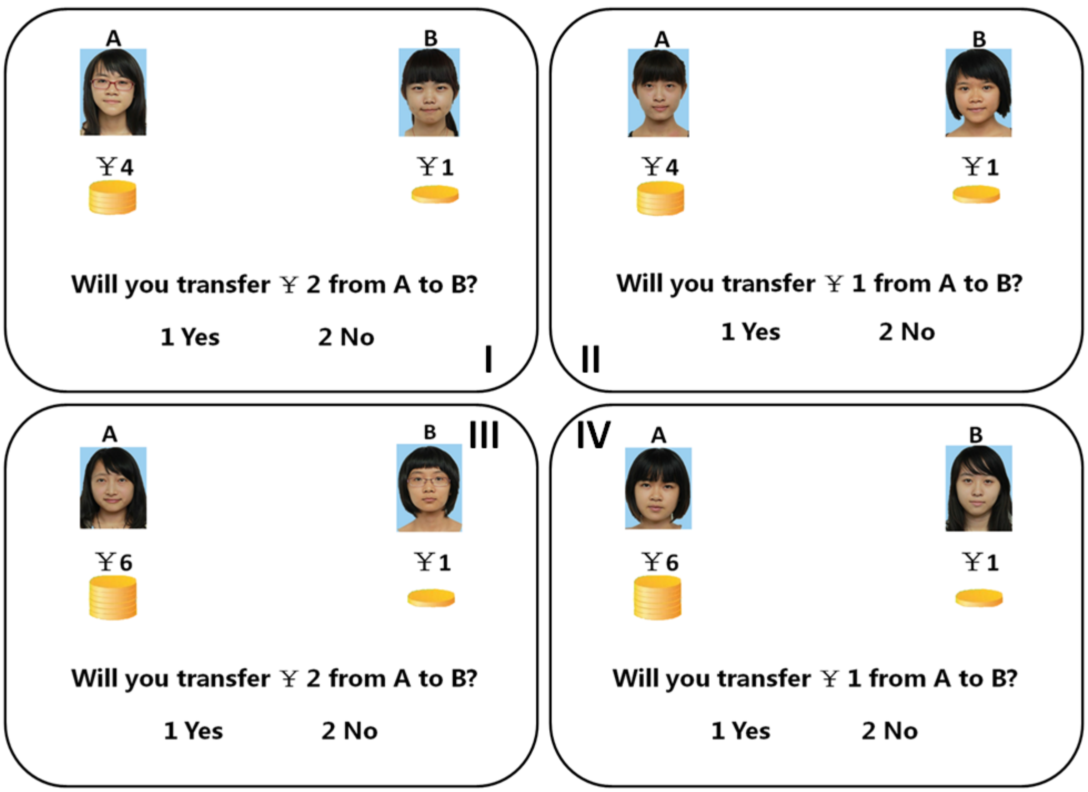
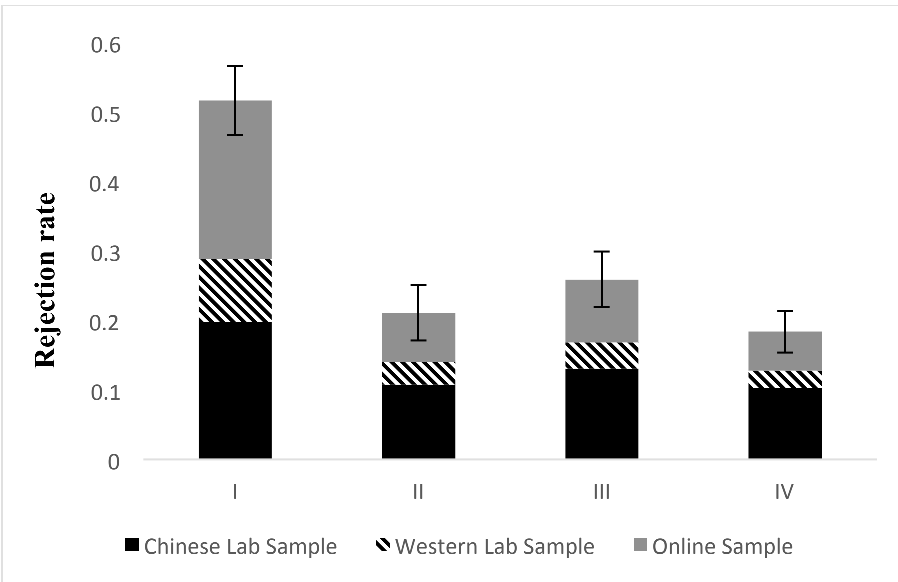


Figure 2: Mean Rejection Rates

Figure 2 shows the rejection rates for each of the four choice problem types. We decompose each bar into the three subject pools we used (Chinese laboratory participants, Western laboratory participants, and online Mechanical Turk workers). The most striking difference is between choice I problems and all of the others. Choice I were the only problems that involved a hierarchy reversal.



Tables

Table 1:

Summary Statistics from the three subject pools results were drawn from.

	Lab (Chinese)	Lab (Westerners)	Online
Rejection Rate	0.27	0.28	0.33
	(0.44)	(0.45)	(0.47)
Age	36.43	25.10	29.17
	(13.70)	(6.91)	(8.98)
Female	0.44	0.26	0.52
	(0.50)	(0.44)	(0.50)
SES	4.23	6.35	5.33
	(1.80)	(1.36)	(1.81)
Politics	4.75	4.77	4.66
(1=very liberal, 7=very conservative)	(1.33)	(1.48)	(1.46)
Social Values	5.02	5.23	4.85
(1=very liberal, 7=very conservative)	(1.22)	(1.54)	(1.55)
Economic Attitudes	4.95	4.13	4.35
(1=very liberal, 7=very conservative)	(1.34)	(1.43)	(1.58)
Interest in Politics	3.04	3.16	2.95
	(0.61)	(0.72)	(0.59)
Racial Composition			
Bi-Racial	0.00	0.13	0.02
Caucasian	0.00	0.74	0.17
Chinese	1.00	0.00	0.00
Hispanic	0.00	0.13	0.00
Indian	0.00	0.00	0.81
Participant Numbers	17120	4960	16000

Standard deviations in parentheses

Table 2

Main regression results. Each observation represented a choice problem. The dependent variable was one if the transfer was rejected and zero if the transfer was accepted. All specifications include subject pool fixed effects.

	(1)	(2)	(3)
	Indiv FE	Logit	Question FE
	Rejected Transfer		
Reversal	0.133***	0.126***	0.127***
	(0.0249)	(0.0216)	(0.0265)
Δendowment	-0.0467***	-0.0415***	-0.0468***
	(0.00770)	(0.00609)	(0.00735)
Δfinal outcome	0.0307***	0.0212***	0.0362***
	(0.00772)	(0.00605)	(0.00809)
Transfer Size	0.103***	0.0922***	0.113***
	(0.0156)	(0.0122)	(0.0170)
Observations	19,040	19,040	19,040
Adjusted R-squared	0.092		0.092

Robust standard errors in parentheses, clustered by subject

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3

Table 3 presents estimates of the impact of reversals decomposed first by question type in columns 1 and 2, and then by subject characteristics.

	(1)	(2)	(3)	(4)
	ΔEndowment	Transfer Size	Demographics	Likert
	Rejected Transfer			
Reversal	0.199***	0.199***	0.0591	-0.0166
	(0.0308)	(0.0308)	(0.0985)	(0.165)
Δendowment	-0.0425***	-0.0484***	-0.0541***	-0.0541***
	(0.00751)	(0.00784)	(0.00814)	(0.00821)
Δfinal outcome	0.0275***	0.0334***	0.0351***	0.0354***
	(0.00754)	(0.00797)	(0.00825)	(0.00833)
Transfer Size	0.0995***	0.111***	0.117***	0.117***
	(0.0155)	(0.0164)	(0.0166)	(0.0167)
ReversalXΔendow	-0.0118***			
	(0.00357)			
ReversalXTransfer		-0.0236***		
		(0.00714)		
Age			-0.00191	-0.00130
			(0.00134)	(0.00143)
Female			-0.00337	0.00594
			(0.0351)	(0.0354)
SES			0.000927	0.00163
			(0.00885)	(0.00953)
ReversalXAge			-0.00114	-0.000644
			(0.00187)	(0.00193)
ReversalXFemale			-0.00540	0.000832
			(0.0467)	(0.0473)
ReversalXSES			0.0226*	0.0235*
			(0.0126)	(0.0129)
Politics				-0.00360
				(0.0183)

Social				-0.00886
				(0.0186)
Economics				-0.00708
				(0.0111)
Interest in Politics				-0.0320
				(0.0308)
ReversalXPolitics				0.0253
				(0.0223)
ReversalXSocial				-0.00520
				(0.0209)
ReversalXEconomics				-0.0125
				(0.0192)
ReversalXInterest				0.00551
				(0.0400)
Observations	19,040	19,040	17,040	16,880
Adjusted R-squared	0.360	0.360	0.374	0.378

Robust standard errors in parentheses, clustered by subject

*** p<0.01, ** p<0.05, * p<0.1

Table 4

Base Results for the Distribution Game. OLS with Subject Fixed Effects and Marginal Effects for a Logit Model.

	(1)	(2)
	Fixed Effects	Logit
	Rejected Transfer	
Reversal	0.0695**	0.0580*
	(0.0269)	(0.0328)
		-
Δendowment	-0.00675	0.00887
	(0.0110)	(0.0141)
Δfinal outcome	-0.0116	-0.0129
	(0.0108)	(0.0141)
Transfer Size	0.0184	0.0203
	(0.0112)	(0.0142)
Observations	19,040	19,040
Adjusted R-squared	0.043	

Robust standard errors in parentheses, clustered by subject

*** p<0.01, ** p<0.05, * p<0.1