

# Social Identity and Preferences over Redistribution\*

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## **Abstract:**

We design an experiment to study the effects of social identity on preferences over redistribution. The experiment highlights the tradeoff between social identity concerns and maximization of monetary payoffs. Subjects belonging to two distinct natural groups are randomly assigned gross incomes and vote over alternative redistributive tax regimes, where the regime is chosen by majority rule. We find that a significant subset of the subjects systematically deviate from monetary payoff maximization towards the tax rate that benefits their group when the monetary cost of doing so is not significantly high. These deviations cannot be explained by efficiency concerns, inequality aversion, reciprocity, social learning or conformity.

**KEYWORDS:** Social Identity, Income Redistribution, Experimental Economics.

**JEL Classification:** C92, D63, D72

## 1. Introduction

A lively debate among social scientists concerns the determinants of preferences over economic policies in democracies. Economic self-interest appears to be a rather poor predictor of voting behavior: poor people do not vote to expropriate the rich, and rich people sometimes support welfare programs from which they do not expect to benefit. Thus, it appears that explaining political preferences should take into account other factors. In particular, researchers have long noted that social context seems to have a crucial effect on political choices [Lazarsfeld et al. (1948), Miller et al. (1991), Beck et al. (2002)]. This view is supported by observed differences in voting patterns and reported policy preferences across social groups such as class, race and religious affiliation, controlling for some measures of economic self-interest [e.g. Campbell et al. (1960), Dawson (1994), Glaeser and Ward (2006)]. One important factor underlying these relationships may be social identity. However, identifying the mechanisms behind group-based voting and distinguishing them from economic self-interest has proven elusive. Part of the difficulty is due to endogeneity of both economic variables and social variables. That is, people with certain characteristics are more likely to earn higher incomes, associate with certain groups and vote in certain ways.

This paper uses an experimental approach to study the effect of social identification on voting over redistribution. In so doing, it sheds new light on our understanding of social preferences. In particular, we focus on one specific component of the general model developed by Shayo (2007), which is based on a large body of work on social

identity. According to the model, individuals that identify with a certain group behave in a way that not only takes into account their self-interest, but also the interest of the group and the typical behavior of its members. Therefore, when making a political choice, individuals may sacrifice some of their monetary payoff to benefit their group and/or to resemble the group's prototypical behavior. Our experiment abstracts from group conformity effects and focuses solely on the effect of the group's interest.

The experiment is designed to identify whether the subject's ingroup wellbeing has an effect on her preferences over redistribution. Subjects are divided into two natural groups based on the subjects' field of studies.<sup>1</sup> They are randomly assigned gross incomes, and are informed of their own income, the overall mean income and the mean income of each group. Subjects then vote anonymously over a redistributive scheme consisting of a linear tax and a lump sum transfer. Taxes do not introduce distortions; that is, overall payoffs are unaffected by the chosen tax scheme. The tax is chosen by majority rule and applied to all the subjects. This procedure is repeated 40 times, without feedback between rounds, and without any interaction between subjects. The income distributions allow us to classify deviations from self-interest into two distinct categories: inequality aversion and group identification. Specifically, inequality averse subjects exhibit a bias towards high redistribution regardless of their ingroup's income. In contrast, social identifiers exhibit a bias towards the tax rate that benefits their

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<sup>1</sup>We divide the subjects into natural groups instead of creating artificial ones to ensure that groups have some real meaning, even if it is very weak. This is meant to avoid a situation where all socially meaningful bases for decision making have been removed, which may render inferences on the effects of group membership in real elections more tenuous.

ingroup.

Our results indicate that 56% of the 126 subjects vote, by and large, to maximize their own monetary payoffs. About 6% can be characterized as inequality averse. Finally, a third of the subjects systematically deviate from monetary payoff maximization towards the tax rate that benefits the average member of their group. That is, they tend to vote for high levels of redistribution when their group is relatively poor – even if they themselves are relatively rich. Further, and in sharp contrast to the behavior expected under inequality aversion, these subjects also vote for low levels of redistribution when their group is relatively rich – even if they themselves are relatively poor. This pattern of behavior is especially striking since all voting decisions are completely unobserved, and groups' prototypical behavior is unknown as well.

Although social identifiers are sometimes willing to forego monetary payoffs to support their group, their decision is still affected by their economic self interest. That is, subjects respond systematically to the costs associated with supporting their ingroup. This allows us to estimate the tradeoff between monetary payoff maximization and social identity concerns among the identifiers. We find that the probability of supporting the ingroup tax rate for the average subject decreases by almost 10 percent for a one-unit increase in the cost of doing so. Furthermore, this probability is significantly higher when the social identifiers belong to a rich ingroup than to a poor ingroup, for every possible cost in the distribution of income analyzed. This behavior cannot be reconciled with standard notions of inequality aversion.

In related economic studies of social identity, Charness et al. (2007) and Eckel

and Grossman (2005) show that minimal groups are insufficient to affect the subjects' behavior. These studies report a significant effect of group identity only when group membership is common knowledge, and when they allow for either payoffs commonality [Charness et al. (2007)] or working together on a group task [Eckel and Grossman (2005)]. Using natural groups, our experiment uncovers a strong effect of group membership without any treatments designed to increase group salience and cohesiveness.

The paper is related to three strands of research. The first, already mentioned, deals with the determinants of voting over economic policies. The second is the literature on social identity both in economics and in social psychology. Most notably, Akerlof and Kranton (2000, 2002, 2005) introduce social identity into economic analysis and propose a model of social identity that focuses primarily on the effects of prescribed behavior associated with various identities. As stated above, the current paper focuses on a different aspect of identification: caring about ingroup payoffs. This feature is a prominent implication of Social Identity Theory [Tajfel and Turner (1979) and (1986)] and is consistent with observed behavior in Minimal Group experiments [Brewer (1979), Bourhis and Gagnon (2001)]. However, showing ingroup favoritism in the Minimal Group Paradigm is costless. Thus, this design does not allow measuring the tradeoff between monetary costs and social identity concerns. Behavior in public goods experiments (which do involve costly decisions) is also consistent with this feature [e.g. Brewer and Kramer (1986), Orbell et al. (1988)]. Our experimental design differs from these experiments in that overall payoffs are held constant, thus avoiding any effect of efficiency concerns.

The third strand of literature is that on social preferences –namely, models that assume that individuals care about other individuals’ payoffs. These models include, most prominently, some combination of altruism and Rawlsian preferences [Charness and Rabin (2002)], warm glow [Andreoni (1989)], inequality aversion [Fehr and Schmidt (1999), Bolton and Ockenfels (2000)], and reciprocity [Rabin (1993), Fehr and Gächter (2000)]. The current paper attempts to expand our understanding of social preferences by isolating the effect of group membership from all the motives listed above.

The remainder of the paper is organized as follows. The next section presents the theoretical framework implemented in the experiment. Section 3 describes our experimental design. The main results of the paper appear in Section 4. Section 5 concludes. Appendix A contains the proof to the theoretical claim and Appendix B contains the instructions of the experiment.

## **2. Theoretical Framework**

The experiment is designed to isolate and examine one specific component of a general model of social identity in a political economy context. The general model has the following structure [Shayo (2007)]. A society may have many social groups, but in any given situation individuals identify with only some of them. Given their social identities, individuals choose courses of action which determine the aggregate outcome. That outcome forms the social environment that can in turn affect the pattern of social identities. The model is thus based on two major components. First, it specifies the

main factors that determine which of the various social groups in a society individuals tend to identify with. Second, the model defines the meaning of identifying with a group. The present study focuses on this last component. Therefore, it does not examine equilibrium behavior. In our experiment, subjects are simply assigned to groups, leaving the endogenous determination of group identification out of the analysis.

We define group identification in terms of preferences. These preferences involve two variables: the status of the various groups that exist in the economy, and the perceived distance between an individual and the other members of the group. Given these two variables, an individual is said to identify with group  $j$  if (1) she seeks to resemble typical members of group  $j$  (i.e. to reduce perceived distance from that group) and (2) she cares about the relative status of group  $j$ . The present study focuses on the latter aspect of identification.

To be more precise, let  $\mathcal{N}$  be a set of individuals,  $\mathcal{A}_i$  a set of available *actions* for each individual  $i \in \mathcal{N}$  and  $\pi_i : \times_{i \in \mathcal{N}} \mathcal{A}_i \rightarrow \mathbb{R}$  the individual's *monetary payoff*. Let  $G$  be a set of social groups, each group being a subset of  $\mathcal{N}$ . In the present study we take these groups as given. Let us denote by  $d_{ij}$  the perceived distance between individual  $i$  and social group  $j$ . In the experiment, individuals' perceived social distances are kept constant. Therefore, we will not specify how  $d_{ij}$  is determined, and treat it as exogenously given. Nonetheless, we note that in the more general model  $d_{ij}$  can vary as a result of individuals' actions and is, therefore, specified as a function  $d_{ij} : A \rightarrow \mathbb{R}$ .

Regarding group status we need to be a little more specific. Studies of social identity often argue that the evaluation of groups cannot usually be based on some absolute



standard. Rather, it is determined through social comparisons to other groups along valued dimensions of comparisons [Tajfel and Turner (1986)]. In our setting one such dimension is monetary payoff. Thus, the status of a social group can be thought of in terms similar to standard definitions of individual status [e.g. Boskin and Sheshinski (1978); Clark and Oswald (1998)]. That is, the status of a group  $j$  is represented by a function

$$S_j(a) = S_j(\bar{\pi}_j(a), \bar{\pi}_{-j}(a)), \quad (2.1)$$

where  $\bar{\pi}_j$  is the mean monetary payoff of individuals that belong to group  $j$  (the ingroup) and  $-j$  is the reference-group of group  $j$ , which in our two-group setting is simply the other group (the outgroup). We assume that the status of group  $j$  is strictly increasing in  $\bar{\pi}_j$  and is decreasing in  $\bar{\pi}_{-j}$ .<sup>2</sup> We define social identity as follows:

**Definition** *Individual  $i \in \mathcal{N}$  is said to identify with social group  $j \in G$  if her preferences over action profiles can be ordered by a utility function of the form:*

$$U_i(a) = U(\pi_i(a), S_j(a), d_{ij}(a)) \quad (2.2)$$

*such that  $U$  is strictly increasing in  $S_j$  and strictly decreasing in  $d_{ij}$ .*

In words, identification with a group is taken to mean caring about the status of that group while paying a cognitive cost that increases with the distance between the individual and the group. That is, identification entails making the group's interest

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<sup>2</sup>Note that we allow for the status function to be constant in  $\bar{\pi}_{-j}$ . In this case group  $j$ 's status depends on the ingroup's mean absolute rather than relative payoff.

part of one's own. Given equation (2.1) this implies caring about the monetary payoffs of the other ingroup members. At the same time, as long as individuals identify with a given group they want to follow that group's typical behavior [Akerlof and Kranton (2000)]. As emphasized above, our experimental design rules out the conformity effect by keeping perceived distance fixed.

In what follows we assume that the utility function of an individual that identifies with group  $j$  is additively separable in monetary payoffs and the social variables; namely,

$$U_i(a) = u(\pi_i(a)) + v(S_j(a), d_{ij}), \quad (2.3)$$

where  $u$  is an increasing and weakly concave function, and  $v$  is strictly increasing in  $S_j$  and decreasing in  $d_{ij}$ .

## 2.1. Implications for Voting over Redistribution

This subsection embeds the social identity framework developed above into a standard political setting of income redistribution, whereby individuals choose a tax rate with its associated lump sum transfers.

Consider a population of individuals where each individual  $i$  has an exogenous pre-tax income of  $y_i$ . The population is partitioned into two social groups,  $P$  and  $R$ . Assume that the mean income in group  $P$ , denoted  $y_P$ , is lower than  $y_R$ , the mean income in group  $R$ . The individuals' group affiliation does not affect their monetary payoffs: individual  $i$ 's monetary payoff is just her after-tax income, which is composed

of income net of taxes and a transfer payment financed by the tax revenues. That is, monetary payoffs are given by

$$\pi_i(\tau) = (1 - \tau)y_i + \tau y, \quad (2.4)$$

where  $\tau \in [0, 1]$  is the tax rate and  $y$  is the mean income.<sup>3</sup> We refer to individuals with income above the mean income as “rich” individuals and to those with income below the mean income as “poor.”

The tax rate is chosen directly by the individuals. Individuals vote over two proposed tax rates,  $\tau^h$  and  $\tau^l$ , with  $\tau^h > \tau^l$ . The winner is decided by majority rule (ties are broken by an equal probability rule). Thus an action for individual  $i$  is a vote from  $\mathcal{A}_i$ , where  $\mathcal{A}_i = \{\tau^h, \tau^l\}$  for all  $i$ .

Assuming perceived distances are unaffected by voting behavior, social identification has the following simple implications, depicted in Figure 1.

**Claim.** *Assume that individuals do not play weakly dominated strategies. It follows that:*

1. *A self-interested individual votes in support of the high tax rate if her income is below the mean income ( $y_i < y$ ); and votes in support of the low tax rate if her income is above the mean income ( $y_i > y$ ).*
2. *An individual who identifies with the rich group votes in support of the high tax*

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<sup>3</sup>The profile of actions affects monetary payoffs only through the chosen tax rate, hence we write  $\pi_i$  directly as a function of  $\tau$ .

rate if her income is below a threshold level  $\underline{\omega}$  (with  $\underline{\omega} < y$ ), and in support of the low tax rate if her income is above  $\underline{\omega}$ .

3. An individual who identifies with the poor group votes in support of the high tax rate if her income is below a threshold level  $\bar{\omega}$  (with  $\bar{\omega} > y$ ). For utility functions  $u$  that are concave enough on the individual's monetary payoffs, there exists a threshold level  $\hat{\omega}$  (where  $\hat{\omega} > \bar{\omega}$ ) such that individuals with incomes between  $\bar{\omega}$  and  $\hat{\omega}$  vote in support of the low tax rate whereas individuals with incomes above  $\hat{\omega}$  support the high tax rate. If  $u$  is not concave enough all the individuals with income above  $\bar{\omega}$  support the low tax rate.

[Figure 1 about here]

**Proof:** See Appendix A.

The basic intuition behind this claim is simple. Assuming that individuals do not play weakly dominated strategies, sheer economic interests should lead rich individuals to support a low tax rate and poor individuals to support a high tax rate [panel (a) in Figure 1]. This is, indeed, the standard approach of positive models of income redistribution.<sup>4</sup> Strategies become more subtle once we allow for group identification. According to the second claim, an individual identifying with the relatively rich group

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<sup>4</sup>In the simplest version of this model individuals' income is exogenously determined [Hamada (1973)]. More recent papers emphasize that individuals' income is a function of their ability and the chosen redistribution scheme [Romer (1975), Roberts (1977), Meltzer and Richard (1981)]. The main message remains unchanged as individuals with ability levels above the mean ability level prefer lower taxes than the rest of the individuals.

is expected to vote in support of a low tax rate even if her income is below the mean, as long as the difference between her income and the mean income is not too high [panel (b) in Figure 1]. Similarly, the third claim states that some individuals identifying with the poor group vote in support of a high tax rate even if their income is above the mean income. Furthermore, if the marginal utility of income decreases fast enough, then an individual identifying with the poor group may vote in support for the high tax rate even if her income is very high [Figure 1, panel (c)]. That is, her marginal utility from an increase of the poor group's status is higher than her marginal utility from an increase in her own monetary payoffs.

Note that preferences for a more equal distribution of net income or a Rawlsian concern for the poor may explain the support for a high tax rate of relatively rich individuals. However, such preferences cannot account for poor individuals' support for a low tax rate when redistribution does not generate deadweight losses.

### **3. Experimental Design**

The present experiment is designed to examine whether, and to what extent, subjects are influenced by their group membership when choosing a redistribution scheme. In particular, to what extent are individuals willing to vote against their own economic interest in order to enhance their ingroup's standing, even when they do not have any information about the typical (or prescribed) behavior in their group, and when their action is never observed by other individuals.

The experiment was conducted at the RatioLab - The Center for Rationality and Interactive Decision Theory at The Hebrew University of Jerusalem. The 126 subjects in this experiment were recruited from the pool of undergraduate students that belong to either the Faculty of Social Sciences or the Faculty of Humanities at The Hebrew University of Jerusalem and had no previous experience in experiments related to redistribution.

The experimental sessions were conducted using networked computers. Each subject was seated at a cubicle in front of a computer screen and was given written instructions. An administrator read the instructions aloud before the experiment started to make sure the rules of the experiment were common knowledge. Subjects were also asked several hypothetical questions at the end of the instructions to verify their comprehension of the procedure (the instructions and questions appear in Appendix B). The experiment began after all subjects had answered all questions successfully. The experiment lasted for about one hour. Payoffs were denominated in “Francs,” which were converted to New Israeli Shekels (NIS) at the rate of 40 Francs per one NIS at the end of the experimental session. Average earnings were equal to NIS 67 (slightly over \$15 USD) and were distributed privately and in cash.<sup>5</sup>

Eighteen subjects participated in each session. At the beginning of each session we divided the subjects into two groups of equal size based on their major field of studies. That is, for every session we recruited nine subjects whose major was from

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<sup>5</sup>The hourly minimum wage in Israel is slightly below NIS 20. Thus, subjects on average earned more than 3 times the minimum wage.

the Faculty of Social Sciences and nine subjects whose major was from the Faculty of Humanities.<sup>6</sup> At the beginning of each session we informed the subjects about the existence of groups, the size of the groups, and their group affiliation. Obviously, subjects maintained their group affiliation throughout the entire session. Subjects were not informed of the exact affiliation of other subjects. In fact, every effort was made to minimize the extent to which participants in a given session knew each other. We did not allow participants to sign up together for a specific session and, among the pool of over three thousands students who had signed up to participate in experiments, we allowed no more than two participants from the same year and major. Throughout the experiment we ensured anonymity and effectively isolated each subject in a cubicle to minimize any undesired interpersonal influence. The allocation of subjects to cubicles was independent of subjects' major field of study. Communication between subjects was not allowed throughout the session. Subjects' anonymity was guaranteed so that neither the other subjects nor the researchers know the ingroup of any particular subject or her action in a given round.

Each session consists of 40 rounds. At the beginning of each round a chance move determines each group's gross income distribution and then each subject's income for the current round. The possible distributions – denoted  $x_1, x_2, y_1, y_2$  – are presented in Table 1. In half the rounds one group draws  $x_1$  and the other group draws  $x_2$ , and in the other half they draw  $y_1$  and  $y_2$ . The design is such that each group draws each

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<sup>6</sup>Students can choose to have a double major at The Hebrew University of Jerusalem. We did not recruit any student who had one field of studies from the social sciences and the second field of studies from the humanities.

of the four distributions ten times. The exact timing of the assignment is randomly determined. Subjects are not informed of the exact distributions of gross income or of the way they are chosen. They only know that after their group's total gross income has been chosen, their individual gross income is randomly chosen, and varies between 10 and 150 Francs. At the beginning of each round each subject is informed of her own gross income, the mean gross income of each group and the overall mean gross income.

[Table 1 about here]

After receiving this information subjects choose between two redistribution schemes. These schemes consist of a proportional tax rate on the income of every subject, with the resulting revenue distributed equally between all subjects. The two proposed tax rates are 20 and 40 percent. The implemented tax is decided by majority rule, with ties broken by an equal probability rule.

After the elections all subjects are notified of the end of the round and of the beginning of a new round. We do not provide the subjects with any feedback whatsoever regarding the outcome of the current or of previous rounds. Subjects learn of the elections' outcomes and their resulting payoffs for each of the rounds only at the end of the experiment. Subjects were informed of this feature of the experimental design at the beginning of the session.

After completing all the rounds and before learning the results of each round, each subject completed a questionnaire that included basic demographics as well as questions



on attitudes to redistribution taken from the General Social Survey (GSS) and the World Values Survey (WVS). The questionnaire also included several questions about the subject's identification with her ingroup. The questionnaire appears in Table 3. After each subject completed the questionnaire she was informed of her gross income, the chosen tax rate and her net income for every single round.

### **3.1. Discussion**

Several comments regarding the experimental design are in order. The chosen design allows us to examine the effect of group membership on voting patterns. In every round there are eight subjects facing a conflict between monetary payoffs maximization and maximizing ingroup status: there are four poor subjects whose ingroup is rich, and four rich subjects whose ingroup is poor. Therefore, our basic test of the existence of social identity effects focuses on these situations of conflict, shown in boldface in Table 1.

The construction of the first two distributions ( $x_1$  and  $x_2$ ) was guided by several criteria. First, we want to examine the behavior of a subject with a fixed income level in situations when the relative mean income of her ingroup changes. This allows us to keep her own monetary incentives constant while changing only the incentives regarding group status.<sup>7</sup> Therefore, except for the highest and lowest income levels, all possible income levels appear in both distributions. Second, we want to distinguish social-identity induced deviations from deviations induced by individuals' preferences

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<sup>7</sup>Note that by keeping the overall mean income constant we abstract from efficiency considerations. See Charness and Rabin (2002) for a study showing the effects of these considerations.

for income equality [Loewenstein, Bazerman and Thompson (1989); Fehr and Schmidt (1999); Bolton and Ockenfels (2000)]. Although a preference for equality may drive a rich subject in a poor group to vote for a high tax rate, this type of preferences cannot account for poor subjects in a rich group supporting a low tax rate. Finally, we want to observe the subjects' decisions for a sufficiently rich support of incomes to examine the trade-off between monetary payoff maximization and social-identity concerns. That is, even if subjects with incomes below the mean do vote for a low tax rate when they identify with the rich group, we want to establish how much of her monetary payoff an individual is willing to forego in order to promote her ingroup's status. The income distributions  $y_1$  and  $y_2$  maintain the main attributes of the distributions  $x_1$  and  $x_2$ , varying only the difference between the mean incomes of the two groups. As it turned out, there was no significant difference in behavior under the  $x$  and  $y$  distributions. Hence the next section reports results combining both distributions.

A final comment relates to the information supplied to subjects. Recall that subjects do not receive any feedback until the end of the experiment. Hence, each subject decides simultaneously on a set of forty votes. This is crucial to identify behavior consistent with caring about ingroup status. For example, information on the outcomes of previous rounds may induce subjects to vote according to their narrow pecuniary interests if others did that in the past, due to conformity to the group. Moreover, the design does not allow for collusive behavior or reciprocity effects. Finally, the chosen design provides 40 independent observations on each subject. With the help of this data set we can examine the behavior of the same subject as her income and her ingroup income

are randomly varied.

## 4. Results

This section presents the main experimental results. We first provide a glimpse of the subjects' behavior when facing a tradeoff between social-identity concerns and their own monetary payoff. We then exploit the rich set of choices made by each subject to classify subjects into three categories: monetary payoff maximizers (MPM), social identifiers (SI), and inequality averse (IA). At the end of this section we closely examine the behavior of SIs vis-à-vis MPMs, and quantify the impact of monetary costs on the likelihood of supporting one's ingroup.

Recall that a subject faces a situation of conflict whenever the relative income of the subject is opposed to the relative income of her ingroup. For each subject we compute the proportion of votes in support of her ingroup out of her total votes in situations of conflict. Figure 2 depicts the distribution of this proportion.

[Figure 2 about here]

The figure highlights two important patterns of the data. First, over a third of the subjects never vote in support of their ingroup at the expense of their own monetary payoffs. This is not for a lack of opportunities since, on average, these subjects faced slightly over 18 situations of conflict. The second interesting pattern that emerges from Figure 2 is the heterogeneity of the subjects' behavior. Once we focus on subjects that

supported their group at least 15 percent of the time (61 subjects), the distribution is close to uniform, with subjects spanning the entire range. Thirty one subjects supported their ingroup at least 50 percent of the time, with eleven subjects that supported their ingroup at least 80 percent of the time.

Some of the observed heterogeneity may be a consequence of subjects' different preferences. Some of it, however, may be due to the different monetary costs of voting for one's ingroup. We take up these two possibilities in turn.

#### 4.1. Classifying Subjects by their Preferences

The deviations from monetary payoff maximization depicted in Figure 2 may not necessarily reflect a preference for higher ingroup payoffs, but may stem from other factors such as plain errors or inequality aversion. Therefore, we propose an econometric test to classify each subject into one of three categories: monetary payoff maximizer, inequality averse or social identifier. Let us consider the following econometric model (to be estimated separately for each subject):

$$E[(vote\ low)_{it}|y_{it}, y_{jt}] = \beta_1(rich)_{it} + \beta_2(rich\ group)_{it} + \beta_3(rich * rich\ group)_{it} \quad (4.1)$$

where  $(vote\ low)_{it}$  equals one if subject  $i$  voted for the low tax rate in round  $t$  and zero otherwise;  $(rich)_{it}$  equals one if  $i$ 's income in round  $t$  was above the mean income ( $y_{it} > y_t$ ) and zero otherwise; and  $(rich\ group)_{it}$  equals one if the mean income of  $i$ 's group in round  $t$  was above the mean income ( $y_{jt} > y_t$ ).

Consider now the behavior of a subject that always chooses to maximize her monetary payoff. Assuming that subjects do not play weakly dominated strategies, a MPM votes for a low tax in round  $t$  if and only if  $y_{it} > y_t$ , independently of her ingroup's relative income. Thus, for a MPM,

$$E[(vote\ low)_{it}|y_{it}, y_{jt}] = rich_{it}. \quad (4.2)$$

It follows that a subject is classified as a monetary payoff maximizer whenever the conditions

$$\beta_1 = 1 \text{ and } \beta_2 = \beta_3 = 0$$

are jointly satisfied.

Consider next a subject that has a preference for income equality. An inequality averse subject never supports the low tax rate when  $y_i < y$ , and may vote in support of the high tax rate when  $y_i > y$ . That is, for an IA,

$$E[(vote\ low)_{it}|y_{it}, y_{jt}] = \beta_1 rich_{it}, \quad (4.3)$$

where  $1 - \beta_1 > 0$  represents the probability that the subject votes in support of a high tax rate when  $y_{it} > y_t$ . This gives us the following parameter restriction

$$\beta_1 < 1 \text{ and } \beta_2 = \beta_3 = 0.$$

Note that, similar to an MPM, the decisions of an IA are independent of her group's relative income.

Finally, a subject that identifies with her ingroup always votes in support of the low tax rate whenever  $y_i > y$  and  $y_j > y$  (thus  $\beta_1 + \beta_2 + \beta_3 = 1$ ). Similarly, this subject never votes for the low tax rate when  $y_i < y$  and  $y_j < y$ . As established in the Claim above, an SI sometimes supports a low tax even when  $y_i < y$  provided that  $y_j > y$ . The necessary conditions for a subject to be an SI in terms of model (4.1) are thus

$$\beta_1 < 0, \beta_2 > 0 \text{ and } \beta_1 + \beta_2 + \beta_3 = 1,$$

where  $1 - \beta_1 > 0$  is the probability of voting for the high tax when the subject is rich and her group is poor; and  $\beta_2$  is the probability of voting for the low tax when the subject is poor and her group is rich.

This suggests that we can classify a subject as a MPM, an IA or a SI by estimating (4.1) separately for each individual and then applying the following procedure:

1. Our null hypothesis is that every subject is a MPM; that is, a subject is classified as a MPM whenever the joint hypothesis  $H_0 : \beta_1 = 1$  and  $\beta_2 = \beta_3 = 0$  cannot be rejected at the 95% confidence level.
2. If  $H_0$  is rejected, we test the joint hypothesis  $H_1 : \beta_1 < 1$  and  $\beta_2 = \beta_3 = 0$ . If this hypothesis is not rejected at the 95% confidence level we classify the subject as an IA.

3. If  $H_0$  and  $H_1$  are rejected, we test hypothesis  $H_2 : \beta_2 > 0$  and  $\beta_3 = 1 - \beta_1 - \beta_2$ .

If this hypothesis is not rejected at the 95% confidence level we conclude that the subject is a SI.

4. If  $H_0$ ,  $H_1$  and  $H_2$  are rejected we conclude that the subject cannot be classified in any of these three categories.

We estimate model (4.1) using OLS with robust standard errors.<sup>8</sup> The resulting classification of the subjects between the three categories is as follows. Of the 126 subjects, for 70 subjects (56%) the null hypothesis of Monetary Payoff Maximization could not be rejected at a 95% confidence level. Of the remaining subjects, 8 (6%) were classified as Inequality Averse, and 42 (33%) as Social Identifiers. Six subjects (5%) could not be classified in any of the three categories according to the procedure described above.

The resulting classification of subjects into three groups according to their preferences is striking for several reasons. Remarkably, the proportion of MPMs is very similar to that found in Andreoni and Miller (2002), who classified 47.2 percent of the subjects as selfish in a dictator game experiment. Subjects that are not MPM are usually classified as inequality averse or efficiency maximizers in the related literature [Charness and Rabin (2002), Tyran and Sausgruber (2006)]. In contrast to previous

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<sup>8</sup>We repeated the estimation of (4.1) using Feasible Generalized Least Squares (FGLS) to adjust for heteroskedasticity of the standard errors. The estimation based on FGLS produced the exact same classification of the subjects as the one based on robust standard errors. The results of these estimations and the subsequent classification of the subjects can be obtained from the authors upon request.

studies, our design allows subjects to deviate from both selfishness and inequality aversion, without introducing efficiency considerations. As a result we obtain a different classification. This classification reveals a very low percentage of IAs and a significantly larger percentage of subjects that support their ingroup, even when this causes greater inequality.

The subjects' support for the different tax rates varies significantly according to their classification. Figure 3 presents the mean proportion of votes for the high tax rate, by the subjects' gross income.<sup>9</sup> The figure shows only the behavior of MPMs and SIs, thus covering 89 percent of the subjects. Further, within each type the figure differentiates the subjects' behavior according to the relative income of their ingroup.

[Figure 3 about here]

This figure plainly shows that group identification significantly affects the subjects' voting behavior. Consider first the behavior of poor subjects (gross income less than 67). For MPMs it makes virtually no difference whether their group is rich or poor: they almost always vote for the high tax rate.<sup>10</sup> For SIs, on the contrary, the ingroup's income has a large effect. Whereas poor SIs in a poor group support the high tax

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<sup>9</sup>To build this figure we compute, for each subject and each income level, the proportion of votes for a high tax across all the different rounds. We then compute the mean across subjects at that income level. This eliminates any effects due to possible correlations across repeated observations within a given subject.

<sup>10</sup>The average proportion of votes for the high tax among poor MPMs is above 97% when in the poor group and slightly below 95% when in the rich group. Mann-Whitney tests cannot reject equal behavior of MPMs in the rich group and in the poor group for any income at a significance level of 1 percent.



rate over 90 percent of the times on average, poor SIs in a rich group support the high tax less than 30 percent of the times.<sup>11</sup> That is, poor SIs in a rich group show a striking disposition to sacrifice their own monetary payoffs to increase their ingroup average welfare. As already pointed out, this behavior is in sharp contrast with possible concerns for inequality aversion.

The overall behavior of subjects when their income is above the mean mirrors their behavior when they are poor. Accordingly, MPMs almost always support the low tax, regardless of the income of their group. On the contrary, whereas SIs in a rich group also vote overwhelmingly for the low tax, SIs in a poor group are equally likely to vote for the low tax as for the high tax.<sup>12</sup> Notably, MPMs are not the only ones to show a low preference for equality of payoffs but also rich SIs when their group is rich.

Summarizing, there is not a significant difference in the voting patterns of SIs and MPMs in situations that do not impose a trade-off between self and group interest. In situations of conflict, however, SIs deviate from narrow self-interest towards the tax that benefits the average member of their ingroup.

#### **4.2. Do Social Identifiers Respond to Monetary Costs?**

In a situation of conflict the cost of supporting the tax that benefits the ingroup increases with the difference between the subject's income and the mean income. Although SIs

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<sup>11</sup>The proportion of poor SIs in a rich group voting for a low tax rate is highly statistically different from the proportion observed for poor SIs in a poor group for any income level (Mann-Whitney, p-value < 0.001).

<sup>12</sup>The behavior of rich SIs in a poor group is highly statistically different from the behavior of rich SIs in a rich group for any given income level (Mann-Whitney, p-value < 0.001).

are willing to sacrifice money for their group, Figure 3 suggests that these subjects do take into account the associated cost. That is, an increase in the cost of supporting the ingroup seems to cause a decrease in the proportion of subjects that choose to do so. For example, SIs in a rich group support the low tax rate over 81% of the time when their income is 40 Francs or higher. However, their support for the low tax drops to 64% and 58% at incomes of 30 and 20 Francs, respectively. Similarly, the average support for a high tax rate by rich SIs in a poor group decreases monotonically from 53% to 39% as their income increases from 80 to 100 Francs. Interestingly, the support for the high tax of SIs in a poor group increases to almost 50% when their income is equal to 110 Francs. This is consistent with a decreasing marginal utility of income.

To further analyze the trade-off between own monetary payoffs and group status among SIs we need to quantify the cost of voting for one's group. The subject's cost of supporting the tax that benefits her ingroup is zero if she is not in a situation of conflict. Consider now a situation of conflict. When the tax that benefits the subject's ingroup is adopted her monetary loss is  $0.2 |y_i - 66.7|$ ; that is, the difference between the two tax rates times the difference between the subject's income and the mean income. When the subject is pivotal, by voting for the tax that benefits her ingroup she increases the probability that this tax is adopted by 50 percent. In this case, the expected cost of siding with one's ingroup is  $0.5 * 0.2 |y_i - 66.7|$ . This is the highest possible cost of supporting one's group.<sup>13</sup> In the analysis below this is the measure of cost we use for

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<sup>13</sup>If the subject is not pivotal the cost of voting for her ingroup is zero. Note that given the available information, subjects cannot compute the actual probability of casting a pivotal vote. This probability is not only a function of the subjects' preferences but also of the income distribution, which is unknown

subjects in situations of conflict.

Table 2 presents the results of the estimation of a random effects probit model for SIs. The dependent variable is whether or not subject  $i$  voted in support of the tax that benefits the average member of her ingroup. The main explanatory variable is the cost of supporting that tax.

[Table 2 about here]

The first column shows that overall the effect of costs on the probability that SIs vote for their ingroup is negative, large in value and highly statistically significant. Accordingly, the probability of supporting the ingroup tax rate for the average subject decreases by almost 10 percent for an increase of one Franc in the cost of doing so. Given that we use the highest possible cost to measure this variable, this estimate is a lower bound of the effects of actual cost. Column (2) adds to the model the square of the cost to assess possible nonlinearities. The results suggest that indeed the subjects' propensity to support their ingroup is better represented by a decreasing convex function.

Column (3) examines whether the subjects' behavior differs systematically when their ingroup is poor or rich. To that effect we introduce a dummy variable equal to one when the ingroup is poor, fully interacted with the cost variables. Interestingly, the subjects' behavior is qualitatively different in a rich or a poor ingroup. This difference

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to the subjects.

is illustrated in Figure 4.

[Figure 4 about here]

This figure presents the predicted probabilities of supporting the ingroup's tax rate as function of the cost for rich and poor ingroups separately based on the estimates in Column (3). Accordingly, the probability that SIs support their ingroup is significantly higher for a rich ingroup than for a poor ingroup for every possible cost in the distribution of income analyzed. In other words, SIs are more willing to incur a cost in support for a rich group than in support for a poor group, even though supporting a rich group increases income inequality. Hence, the subjects' behavior cannot be reconciled with standard notions of inequality aversion. We conjecture that this behavior could be a consequence of subjects attaching a higher status to rich groups. Finally, we observe that the probability of supporting the ingroup decreases linearly for rich groups but it is represented by a convex function for poor groups.<sup>14</sup> This evidence supports the hypothesis that rich subjects derive a higher marginal utility from an increase of the poor ingroup's status than from an increase in their own monetary payoffs. Quantitatively, the probability that a rich subject supports her poor ingroup increases for incomes above 101 Francs.

The next subsection explores the characteristics of subjects classified as social identifiers vis-a-vis the characteristics of the subjects classified in the rest of the groups.

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<sup>14</sup>Note that the coefficient on the cost squared is not significantly different from zero, whereas the cost squared interacted with the indicator for a poor ingroup is positive and statistically significant.

### 4.3. Characteristics of Social Identifiers

We now examine several characteristics of SIs vis-a-vis the MPMs. Our first objective is to assess whether SIs have a heightened awareness of their group membership and feel more emotionally involved with their group. In addition we examine how stated preferences over redistributive policies and other characteristics correlate with the probability that the subject identifies with her group.

Table 3 shows summary statistics for the entire sample and separately for SIs and MPMs.

[Table 3 about here]

Consistent with other studies, we observe the well known “economist effect” whereby subjects studying economics and/or business administration are significantly more likely to exhibit a selfish behavior [Marwell and Ames (1981); Frank et al. (1993)]. We do not find a significant direct relationship between the subjects’ revealed preferences and their reported income. On the other hand, social identifiers convey greater concern over income inequality and express a somewhat higher willingness to help the poor.

The answers to the questions measuring the components of social identity are reassuring. SIs consistently report a heightened awareness of their group membership and feel more emotionally involved with their group than MPMs. Since our classification of subjects is based on their revealed preferences, this provides some validity to related empirical studies that impute the behavior of the population using surveys [Luttmer (2001); Fong (2001)].

Table 4 presents the correlation between self-reported income and self reported preferences for redistribution. Income is measured on a 5 point scale from Rich, through Middle-Class to Poor. Since our subjects are university students, we concentrate on reported parental income when subjects were in high school, rather than on current income.<sup>15</sup> We use two questions that measure preferences for redistribution. The first, adapted from the World Values Survey (WVS), asks whether inequality in israel should be reduced or increased. The second, adapted from the General Social Survey (GSS) asks whether the government should improve the standard of living of the poor in Israel. We then compare the results obtained from our sample of university students to those obtained from representative samples of the Israeli and American populations, using the WVS and the GSS.

[Table 4 about here]

The first thing to note is that for MPMs, the correlation between support for redistribution and income is consistent with what standard political economy suggests: richer people tend to oppose redistribution more strongly. However, for those subjects who exhibited social identification, the correlation has a negative sign and the hypothesis that the correlation is zero cannot be rejected for either question. Overall, the correlation between income and stated preferences over inequality in our entire sam-

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<sup>15</sup>Presumably, this is a better measure of the subjects' economic conditions. Results are qualitatively similar when using current income, but the correlations are generally weaker.

ple is 0.16. This is remarkably similar to the correlation of 0.12 observed in the 2001 Israeli WVS, which consists of a representative sample of 1161 respondents. A similar correlation is also observed in the American WVS.<sup>16</sup> Our results then suggest that the well-documented low correlation between income and preferences over redistribution may partly be due to the fact that a significant portion of the population votes according to their group – rather than their own – economic interests.

## 5. Conclusions

To be added.

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<sup>16</sup>Regarding the helping-the-poor item we do not have representative data from Israel. The relationship using the American GSS is much stronger than that observed in our sample.

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## Appendix A: Proof of Claim 1

1. Assume first that individual  $i$  maximizes her monetary payoffs  $\pi_i$ . From equation (2.4) follows that  $\pi_i(\tau^h) > \pi_i(\tau^l)$  if and only if  $y_i < y$ . Thus, for  $y_i < y$  and any profile of actions of the other voters, individual  $i$  cannot increase  $\pi_i(\tau^h)$  by voting  $\tau^l$ , and is strictly better off voting  $\tau^h$  when she is pivotal. A similar argument holds for  $y_i > y$ .

2. Assume that individual  $i$  identifies with group  $j$ . Let us define  $\Delta u_i := u(\pi_i(\tau^h)) - u(\pi_i(\tau^l))$  and  $\Delta v_i := v(S_j(\bar{\pi}_j(\tau^h), \bar{\pi}_{-j}(\tau^h), d_{ij}) - v(S_j(\bar{\pi}_j(\tau^l), \bar{\pi}_{-j}(\tau^l), d_{ij}))$ . Individual  $i$ 's weakly dominant strategy is to vote in support of  $\tau^h$  whenever  $\Delta u_i + \Delta v_i > 0$  and to vote in support of  $\tau^l$  otherwise. Since  $u$  is increasing in  $\pi_i$  we have  $\Delta u_i > 0$  if and only if  $y_i < y$ . Similarly, it follows from (2.1) that  $S_j(\bar{\pi}_j(\tau^h), \bar{\pi}_{-j}(\tau^h)) > S_j(\bar{\pi}_j(\tau^l), \bar{\pi}_{-j}(\tau^l))$  if and only if  $y_j < y$ . Given that  $v$  is increasing in  $S_j$  we have that  $\Delta v_i > 0$  if and only if  $y_j < y$  as well.

Suppose individual  $i$  identifies with the rich group. This implies that  $\Delta v_i < 0$ . If  $y_i > y$  then  $\Delta u_i < 0$  and  $i$ 's weakly dominant strategy is to vote for  $\tau^l$ . If  $y_i < y$  then  $\Delta u_i > 0$ . Since  $u$  is an increasing and weakly concave function of  $\pi_i$  it follows that exists  $\varepsilon > 0$  such that  $\Delta u_i + \Delta v_i < 0$  for  $y_i + \varepsilon = y$ . This establishes that  $\underline{\omega} < y$ . Concavity of  $u$  implies that  $\underline{\omega}$  is uniquely defined.

3. An argument similar to the one above proves the existence of  $\bar{\omega} > y$ . To establish the existence of  $\hat{\omega}$  note that whereas  $\pi_i(\tau^l) - \pi_i(\tau^h)$  strictly increases with  $y_i$  when  $y_i > y$ , for  $u$  concave enough there exists a threshold value of income such that

the absolute value of  $\Delta u_i$  decreases on  $y_i$ . Since  $\Delta v_i$  (which is strictly positive) is independent of  $y_i$  it follows that exists  $\widehat{\omega} > \bar{\omega}$  such that  $\Delta u_i + \Delta v_i > 0$ . ■

**Table 1: Gross Income Distributions**

	$x_1$	$x_2$	$y_1$	$y_2$
1	10	<b>20</b>	10	<b>20</b>
2	20	<b>30</b>	20	<b>30</b>
3	30	<b>40</b>	20	<b>40</b>
4	40	<b>50</b>	20	<b>50</b>
5	50	80	20	110
6	<b>80</b>	90	<b>80</b>	110
7	<b>90</b>	100	<b>90</b>	110
8	<b>100</b>	110	<b>100</b>	110
9	<b>110</b>	150	<b>110</b>	150
Group Mean	58.9	74.4	52.2	81.1
Overall Mean	66.7		66.7	

Treatments with a tradeoff between own and group material payoff appear in boldface.

**Table 2: Random Effect Probit Estimates of Support for Ingroup among Social Identifiers**

	(1)	(2)	(3)
Constant	1.4946 (12.78)	1.6268 (13.54)	1.8918 (12.21)
Cost of voting for group	-0.3691 (-15.86) [-0.0907]	-0.7719 (-9.65) [-0.1835]	-0.4948 (-4.12) [-0.1121]
Cost Squared		0.0962 (5.31) [0.0229]	0.0281 (1.09) [0.0064]
Poor Ingroup			-0.3902 (-2.82) [-0.0884]
(Poor Ingroup) * Cost			-0.5257 (-3.15) [-0.1191]
(Poor Ingroup) * (Cost Squared)			0.1212 (3.17) [0.0275]

Notes: The dependent variable is the probability of voting in support for the ingroup. The sample consists only of subjects classified as Social Identifiers and has 1680 observations. *t*-statistics are in parentheses. Marginal effects evaluated at the means appear in brackets.



**Table 3: Subjects' Characteristics Classified by their Preferences**

	SI	MPM	All
Percent male	0.333	0.486	0.413
Percent in Faculty of Social Sciences	0.429	0.571	0.500
Percent studying Economics and/or Business Administration	0.190**	0.471**	0.341
Parent income when in high school (1 = poor, 5 = rich)	3.143 (0.751)	3.057 (0.883)	3.056 (0.813)
Income today (1 = poor, 5 = rich)	2.929 (0.947)	2.886 (0.826)	2.849 (0.859)
<b>Inequality:</b>			
1 = "Incomes in Israel should be more equal"	3.881*	4.543*	4.206
10 = "We need larger income differences as incentives for individual effort"	(2.452)	(2.250)	(2.347)
<b>Helping the poor</b>			
1 = "The government should do everything possible to improve the standard of living of all the poor in Israel"	3.048 (2.326)	3.529 (2.131)	3.373 (2.160)
10 = "improving the standard of living of the poor is not the government's responsibility: people should take care of themselves"			
<b>Social identification:</b>			
(1= strongly disagree, 7= strongly agree)			
1. Being a student of [own faculty] is an important part of my identity	4.143 (1.761)	3.829 (1.818)	4.040 (1.791)
2. When someone criticizes[own faculty] it feels like a personal insult	3.167* (1.807)	2.629* (1.704)	2.968 (1.771)
3. When I talk about students of [own faculty] I usually say 'we' rather than 'they'	3.976 (2.170)	3.786 (1.887)	3.968 (1.984)
4. I am proud to be a student in [own faculty]	5.095 (1.590)	4.814 (1.467)	4.968 (1.486)
5. I am similar to other students of [own faculty]	3.976 (1.774)	3.943 (1.453)	4.000 (1.565)
6. I would rather be a student of [other faculty]	2.262 (1.251)	2.300 (1.366)	2.325 (1.361)
Number of Subjects	42	70	126

Mean responses to questionnaire administered at the end of the experiment. Standard deviations are in parentheses. *Inequality* item adapted from the World Value Survey (WVS); *Helping the poor* item adapted from the General Social Survey; Social identification items 1-3 adapted from Roccas (2003); item 4 adapted from WVS, and items 5-6 adapted from Ellemers et al. (1999).

\* - difference between SI and MPM populations is significant at 10% level according to Mann-Whitney test

\*\* - difference between SI and MPM populations is significant at 1% level according to Mann-Whitney test

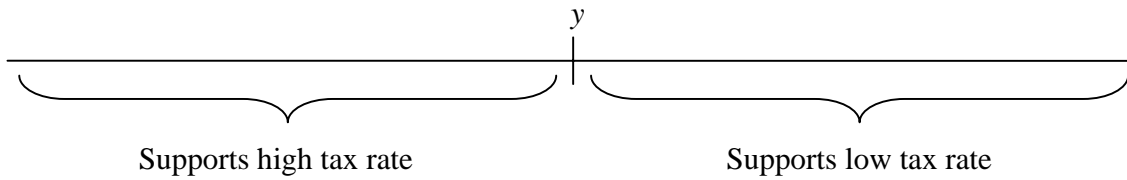
**Table 4: Correlation between Income and Self-Reported Preferences over Redistribution**

	SI	MPM	All	WVS Israel 2001	WVS/GSS USA 1999/2000
	(1)	(2)	(3)	(4)	(5)
<b>Inequality:</b>					
1 = "Incomes in Israel should be more equal"	-0.0700 (0.6596)	0.2833 (0.0175)	0.1616 (0.0706)	0.1199 (0.0000)	0.1142 (0.0001)
10 = "We need larger income differences as incentives for individual effort"					
<b>Helping the poor</b>					
1 = "The government should do everything possible to improve the standard of living of all the poor in Israel"	-0.1017 (0.5217)	0.1455 (0.2295)	0.0473 (0.5988)		0.1318 (0.0000)
10 = "improving the standard of living of the poor is not the government's responsibility: people should take care of themselves"					
N	42	70	126	1161	WVS:1174 GSS: 1816

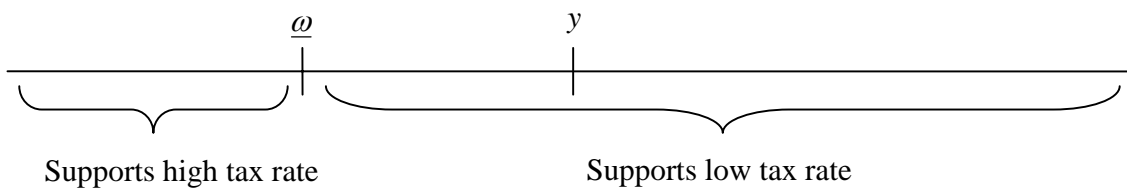
Significance levels in parentheses. Columns 1-3 report results for experimental subjects using the *parent income* variable (1=poor, 3=middle class, 5=rich). Column 4 reports results from the Israel World Values Survey using the same *inequality* question and respondent's social class (1=lower class, 5=upper class). Column 5 reports results for the *inequality* item from the USA 1999 World Value Survey, and for the *helping the poor* item from the GSS 2000, using a 4-valued social-class question (1=lower class, 4=upper class).

**Figure 1: Implications of Identification on Voting Behavior**

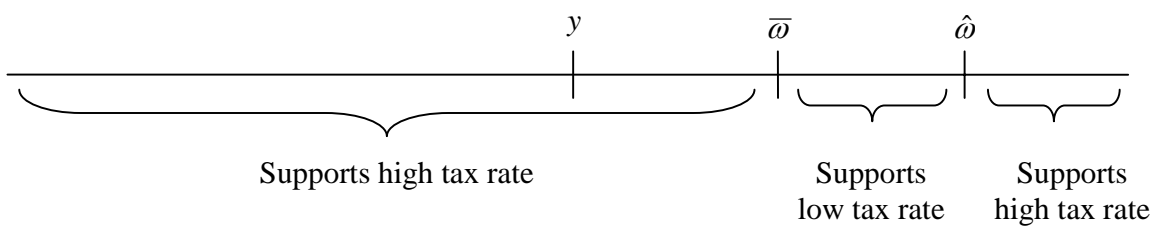
(a) Monetary Payoff Maximizer:



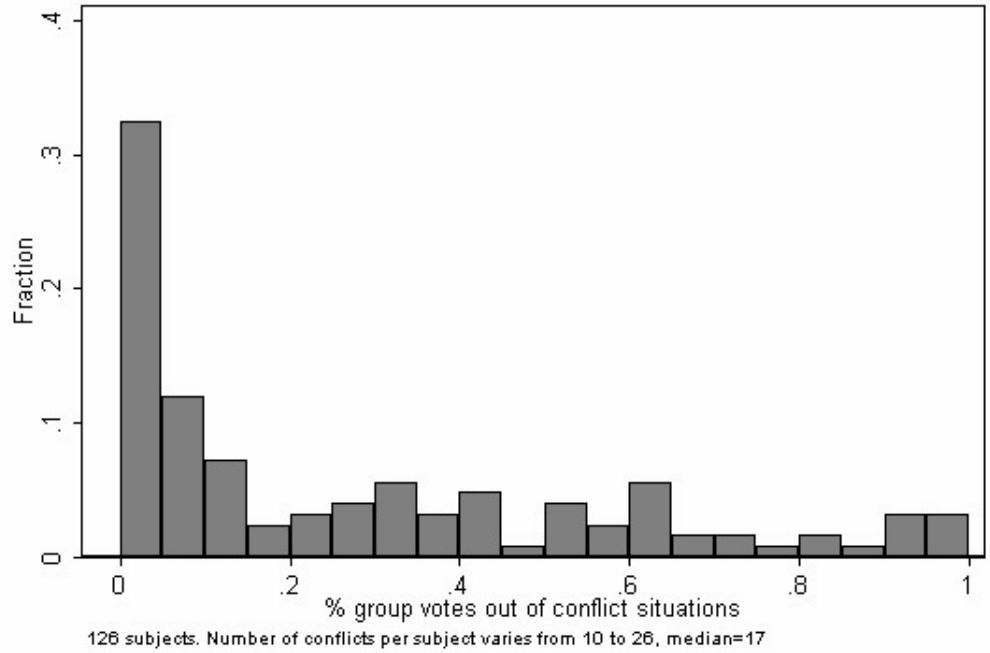
(b) Individuals that identify with a rich group:



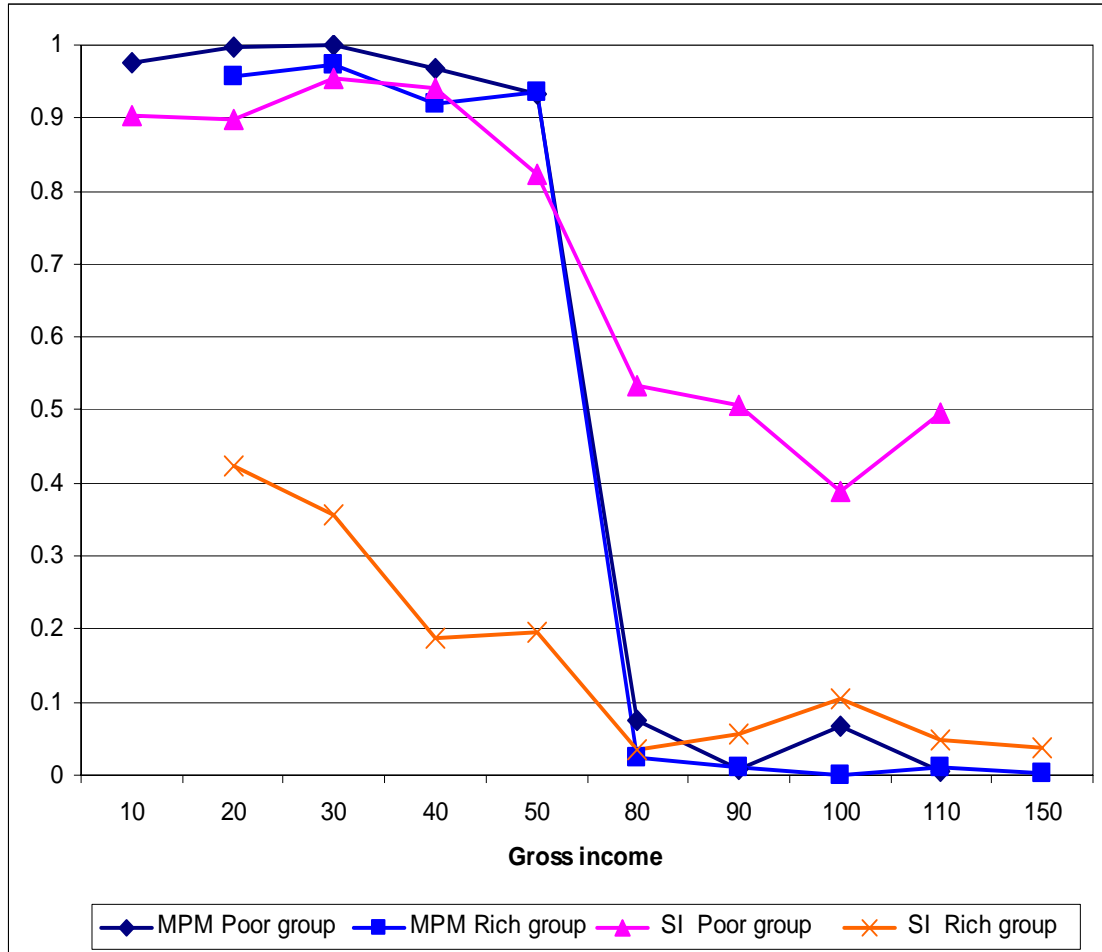
(c) Individuals that identify with a poor group:



**Figure 2: Distribution of group votes out of conflict situations**



**Figure 3: Propensity of Subjects that Vote in Support of the high tax rate**



This figure depicts, for each subject and each income level, the proportion of votes for a high tax rate across all the different rounds. We then compute the mean across subjects at that income level.

**Figure 4: Predicted Probability of Supporting the Ingroup, by the Ingroup's Relative Income**

