Identity, Group Conflict, and Social Preferences

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PRELIMINARY

Abstract: This paper presents a novel experiment on group conflict. Subjects are divided into groups according to preferences on paintings, and subjects are divided into groups according to self-declared political affiliations and leanings. Using a unique within subject design, we find twenty percent of subjects destroy social welfare – at personal cost – when facing a subject outside their group. This effect relates to individual identities. Some participants do not react to the minimal group treatment, but do react to the political treatment. Democrats and Republicans, in contrast to Independents, behave more selfishly and destructively towards out-group members. The results reveal systematic heterogeneity in social preferences, which depend on the social context.

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I. Introduction

This paper presents a novel experiment on identity, group divisions, and social preferences. While the classic economic paradigm posits that people act of out of their own self-interest,[1] it also has been long held that human beings are not purely selfish. Rather, people are cooperative and concerned with fairness, reciprocity, and social welfare.[2] In economic experiments, subjects have been found to give up own payoffs in order to achieve higher total payoffs and allocations that are more equitable.[3] Yet this picture does not jibe with much of human history. Throughout time people have been unfair and cruel to others. History is marked with forced extraction of goods and labor, prolonged and destructive wars, ethnic conflict, and genocide.[4] Even today, and even in modern democracies, empirical research shows that ethnic divisions are related to lower levels of public goods, dysfunctional institutions, and reduced growth.[5]

This paper delves into these apparent contradictions. We conduct an experiment exploring how people behave towards others. We study allocations of income in two kinds of settings: *non-group*—where participants allocate income to self and to other participants who are indistinguishable from one another, and *group*—where participants allocate income to self and to others who are distinguished as being in or out of one's assigned group. With our design, we are able to characterize both average and individual behavior.

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1. See the often-quoted lines from Adam Smith's *Wealth of Nations* "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity, but to their self-love, and never talk to them of our own necessities, but of their advantages." (1776, (2003) pg. 23).

2. For perspectives from economics as well as other disciplines see Gintis, Bowles, Boyle, & Fehr (2006).

3. In the experimental economics of fairness and social preferences, see for example Andreoni & Miller (2002) Bolton & Ockenfels (2000), and Charness & Rabin (2002).

4. For prominent political science treatments of identity and group conflict vs. cooperation see Hardin (1997) and Fearon & Laitin (1996). Much social psychology research is devoted to identity and group conflict (Tajfel & Turner (1979), Smith & Mackie (2000)).

5. Studies include Easterly & Levine (1997), Alesina, Baqir, & Easterly (1999), Alesina & La Ferrara (2005), Miguel & Gugerty (2005), and Esteban, Mayoral, and Rey (2012).

Our main findings are: Many subjects seek fair payoffs and higher total payoffs. But many subjects simply maximize their own payoffs, as in the classic economics paradigm. Moreover, a significant number seek to dominate others, destroying social welfare in the process. This selfishness and dominance-seeking is especially pronounced in the group settings and relates to participants' identification with their assigned group.

The group divisions in our experiment are necessarily mild compared to the historical conflicts recalled above. Yet, even in a congenial university environment, about twenty percent of participants are concerned with relative payoffs to the extent that they destroy social welfare—at personal cost—when choosing payoffs for themselves and a subject outside their group. This behavior is not punishment or retaliation for non-cooperative behavior or the "negative reciprocity" shown in other experiments.[6] Subjects in our experiment are not responding to the choices of others; they are simply choosing payoff allocations.

The results echo new interpretations of Stanley Milgram's (1974) obedience experiments, which are (mis)understood to show people are uniformly obedient.[7] In our study, we find people are not homogeneous and do not automatically adopt a bias against the out-group. Rather, individuals have systematically different social preferences, and these preferences depend critically on individual identity and the social context.

This experiment makes three contributions, elaborated below. First, it advances the quest for uncovering the distribution of individual social preferences, as outlined in Fehr & Schmidt (1999). Second, the results give support for the relationships between social identity and economic behavior, as argued in Akerlof & Kranton (2000, 2010). Third, the analysis uses new methods to study individual

6. See, e.g., Fehr & Schmidt (1999), Fehr & Gächter (2000), Charness & Rabin (2002), and Andreoni, Harbaugh & Vesterlund (2003).

7. While Milgram's baseline study has been shows high levels of obedience, Reicher & Haslam (2011) argue that the other variants indicate subjects' responses relate to their individual identities.

variation in experimental data. The experimental design and these methods allow us to both uncover the individual social preferences and relate behavior to individual identity.

In this experiment, conducted at Duke University, subjects allocate money to themselves and to others in three conditions: a non-group control, a minimal group treatment, and a political group treatment. In the minimal group treatment, subjects are divided into two groups according to their preferences over images and lines of poetry, following the classic method in social psychology (Turner (1978), Tajfel & Turner (1979)). In the political group treatment, subjects are divided into two groups according to their self-declared political affiliations and leanings; Democrats and Republicans are assigned to one of two groups, and Independents are similarly assigned to these groups depending on their stated closeness to one of these two political parties. In both group treatments, subjects are given information on how subjects in their assigned group and subjects in the other group answered survey questions. The non-group treatment serves as a control for both group treatments. The minimal group treatment serves as a control for the political group treatment. The minimal group treatment places subjects in arbitrary groups; the political group treatment puts subjects into groups that may have "real-world" social meaning.

We analyze the data in two ways, both of which lead to the same conclusions. We first take an unstructured looks at subjects' allocation choices. Using a factor analysis, we derive a representation of individual subjects' choices and distinct sets of allocation matrices, which emerge from the estimation. Second, we take a structural approach and estimate individual social preferences by positing a utility function, employing a finite mixing model to estimate types of individuals, and then categorizing individual subjects by these types.

With both of our data methods, we find that there are distinctly different types of individual behavior and related social preferences, which depend on social context. The findings of dominance-seeking, in particular, are new. With only few exceptions, experiments have not seen uncovered such individual behavior, as either the design precluded such choices or it was not possible to study individual preferences.[8] We find in the non-group condition, about 37% of subjects have preferences to maximize social welfare and 33% aim for fair allocations. Yet, 25% of subjects are selfish; they put almost no weight on anyone's payoffs but their own. The remaining 5% are dominance-seeking. In the group treatments, more than half of the subjects are neither fair nor social welfare maximizing when allocating to out-group subjects. In particular, about 21% are dominance-seeking and 35% are selfish. The greater prevalence of dominance-seeking and selfishness in the group contexts is significant.

This paper studies identity as a possible source of this variation and the response to group treatments. Identity, here, as in social psychology, indicates an individual as feeling part of or being described by a social category or group. Examples of broad social categories in the real world are gender, race, ethnicity, nationality, political party, etc. Early experiments in economics employed such "natural groups" and found that the race or ethnicity of subjects changes play in dictator and ultimatum games (e.g., Fershtman & Gneezy (2000), Glaeser, Laibson, Scheinkman, and Souter (2000)). More recent work shows that natural groups impact play in prisoner's dilemma, public goods and trust games (e.g., Goette, Huffman & Meier (2006), Bernard, Fehr, & Fischbacher (2006)). In an experiment studying redistribution, Klor & Shayo (2010) divide subjects into two groups according to their university fields of study and ask them to vote on different redistributive schemes.[9] A second method to study identity and group effects is to create social categories inside the laboratory, using the minimal group paradigm which

8. Fehr, Hoff, and Kshetramade (2008) study allocations in within-caste matches and find high caste subjects choose allocations with higher relative payoffs (but lower absolute payoffs for self) more often than low caste subjects. In a setting like our non-group control, Iriberri & Rey-Biel (2011) estimate individual social preferences find that about 10% of subjects are dominance-seeking. Andreoni & Miller (2002) find individuals do follow different rules for allocating payoffs, but the utility function they estimate does not allow for dominance-seeking behavior. Bolton & Ockenfels (2000, p. 172, Assumption 3) rule out such behavior by assumption on the shape of their proposed utility function. Fehr & Schmidt's (1999) utility function allows for the possibility of such behavior, but they do not include it in their analysis; they argue would not change equilibrium behavior in the games they consider (p. 824). Charness & Rabin (2002) and Chen & Li (2009) average across subjects.

9. In Klor & Shayo (2010) subjects are assigned gross incomes and asked to vote over alternative redistributive tax schemes. They find that subjects vote more often for the tax rate that favors in-group members.

is prevalent in social psychology and widely shown to create group effects.[10] In an economic experiment, Chen and Li (2009) use a minimal group paradigm and study average social preferences towards in-group and out-group members.

The present study combines both methods, where the minimal group treatment serves as a control for the political group treatment. That is, the minimal group treatment can uncover individual tendencies to react towards group divisions in general, while the political group treatment can uncover the effect of a specific division with "real-world" social meaning. To conduct the analysis, we split the sample into Democrats, Democratic-leaning Independents, Republicans, and Republican-leaning Independents. Since there are too few subjects in the latter two sets, we focus on Democrats vs. Democratic-Leaning Independents. We find that Democrats' behavior is significantly different in the minimal group treatment than in the non-group control, exhibiting, for example, much more dominance-seeking behavior towards out-group members. In the political group treatment, Democrats' behavior yet further distinguishes between in-group and out-group members, showing the salience of the real-world identities. Democrat-Leaning Independents' behavior, however, is virtually the same in the minimal group treatment as in the non-group treatment. These subjects are not affected by the arbitrary minimal group division. Our interpretation is that these subjects are not "joiners," as they literally maintain their independence in the largely Democratic campus community and socio-demographic cohort. Yet, these subjects do respond to the political treatment. Their behavior looks like, though is not quite as strong as, that of Democratic-party subjects. This "real-world" group division is salient and alters their behavior.

Our experiment and analysis draw on the behavioral economics tradition and work on social preferences. Our utility function derives from Fehr & Schmidt (1999) and Charness & Rabin (2002), and we follow Charness & Rabin's (2002) lead on using simple choices of allocations to identify social preferences. Charness & Rabin (2002) find, on average, subjects seek to maximize social welfare. Chen

10. For comprehensive review of the minimal group paradigm and experiments in social psychology, see Haslam (2000). Chen & Li (1999) and Akerlof & Kranton (2010) provide extensive reviews of the experimental literature on identity and social groups in social psychology and economics.

& Li (2009) use a minimal group paradigm find, on average, subjects are fairer to people in their groups than out of their groups. Similar to Andreoni & Miller (2002), this paper estimates individual social preferences, rather than the average, and finds subjects can be neatly categorized as having one of several distinct "types" of preferences, which almost completely describe their choices. The present experiment allows for "dominance-seeking" behavior, which was not possible in Andreoni & Miller (2002), and studies how the subjects' behavior changes across social contexts.

To estimate individual preferences, we employ a finite mixing model, which is a relatively new method in experimental economics.[11] We use the utility function proposed by Fehr & Schmidt (1999) and Charness & Rabin (2002) and estimate parameters using a discrete choice maximum likelihood function and a finite mixing model. The mixing model estimates *types* of subjects, where the parameters characterizing each type are not assumed but are those that maximize the likelihood function. We can then interpret these types according to the utility function: we find subjects are distinctly either "selfish," "fair," "social welfare maximizing," or "dominance-seeking." Iriberri and Rey-Biel's (2011) also study the possibility that subjects adopt distinct behavior in dictator game; they estimate four types using the same utility function that we adopt.[12] We take a further step and classify individual subjects into types in a way consistent with the mixing distribution (Nagin (2005)). That is, we construct a posterior probability that each individual is of certain type and assign individuals to the type with the greatest posterior probability. To our knowledge the present study is the only one in behavioral economics that takes this next step and combines this classification with demographics and other subject-specific data to

11. To the best of our knowledge, Stahl & Wilson (1994) were the first use of finite mixture modeling in behavioral experiments. They and followers such as Bosch-Domènech et. al. (2010) consider beauty contest games, estimating the proportion of subjects who reason at different levels. Harrison & Rutström (2009) and Conte, Hay, and Moffatt (2011) allow for a mixture of expected utility and prospect theory. Andersen, Harrison, Lau & Rutström. (2011) allow for part of the population to behave according to traditional exponential discounting and the remainder to behave according to hyperbolic discounting.

12. Econometrically, the present paper differs from Iriberri & Rey-Biel (2011) in that we use the mixture model to calculate these posterior probabilities. Substantively, the goals of the papers are also different. Iriberri & Rey-Biel (2011) study how future play depends on knowing the distribution of current play, and they take great care to minimize any interpersonal influences that could stimulate other-regarding behavior.

study the sources of individual variation.[13] It is this step that allows us to test whether individual subjects react to different treatments, described above.

This paper is organized as follows. Section II describes the experiment in detail and provides a breakdown of the political affiliations of the subject pool. Section III shows the choice patterns in the three experimental settings, using a non-structural analysis of the data. Section IV demonstrates the empirical strategy for estimating individual social preferences and reports the main statistical results. Section V concludes.

II. The Experiment and Subject Pool

The experiment was conducted in the Duke Center for Cognitive Neuroscience, which follows the same protocols as laboratories in experimental economics, in particular the protocol of no deception. The experiment involved 141 subjects drawn from the Duke University community. Sessions were held at various times of day and were spread across January, February, and March 2011.

Figure 1. Timeline of Experiment

Instructions	3-5 Minutes
Non-Group Control	
52 Choices	12 Minutes
Minimal Group or Political Group Treatment (randomized)	
Survey	2-5 Minutes
78 Choices	17 Minutes
Minimal Group or Political Group Treatment (randomized)	
Survey	2-5 Minutes
78 Choices	17 Minutes
Post-Experiment Survey	10 Minutes

13. Klor & Shayo (2010) classify subjects into types according to the individual utility parameter estimates, as in Andreoni & Miller (2002). They then relate this type-classification to individual attributes and answers to survey questions.

For all subjects, experimental sessions proceeded as illustrated in Figure 1. First, subjects received instructions on the decisions they would be asked to make and practiced using the pre-defined computer keys that would indicate their choices. All sessions began with the *non-group* control. Each subject then made decisions in the *minimal group treatment* and the *political group treatment*. The order of the group treatments was randomized across subjects.

In the non-group control, subjects were asked to allocate money to themselves and other participants. There were two kinds of pairings, and all pairings occurred randomly. Subjects allocated money between themselves and other subjects, labeled YOU-OTHER matches. Subjects also allocated money between two random other subjects, labeled OTHER-OTHER matches. These latter matches involved no loss or gain to the subject who made the decision.

In each group treatment, subjects were divided into two groups according to their answers to survey questions. In the *minimal group treatment*, subjects were asked, "Which do you prefer?" between, variously, two lines of poetry, two landscape images, and two paintings by Klee or Kandinsky. Subjects were then assigned to one of two groups, and they were given (true) information on the percent of subjects in their group who answered similarly in the survey and the percent of subjects in the other group answered differently. Subjects then allocated money to themselves and others in three kinds of pairings. Subjects allocated money (i) between themselves and own-group members, labeled YOU-OWN matches, (ii) between themselves and other-group members, labeled YOU-OTHER matches, and between own-group members and other-group members, labeled OWN-OTHER matches. For each, the participants were given information about the subjects as to whom they were allocating income—the group assignment and the commonality of answers to survey questions. The screens indicated the match type, as in Figure 2, for a YOU-OTHER match. The order in which a subject received each type of match, for each matrix, was random.

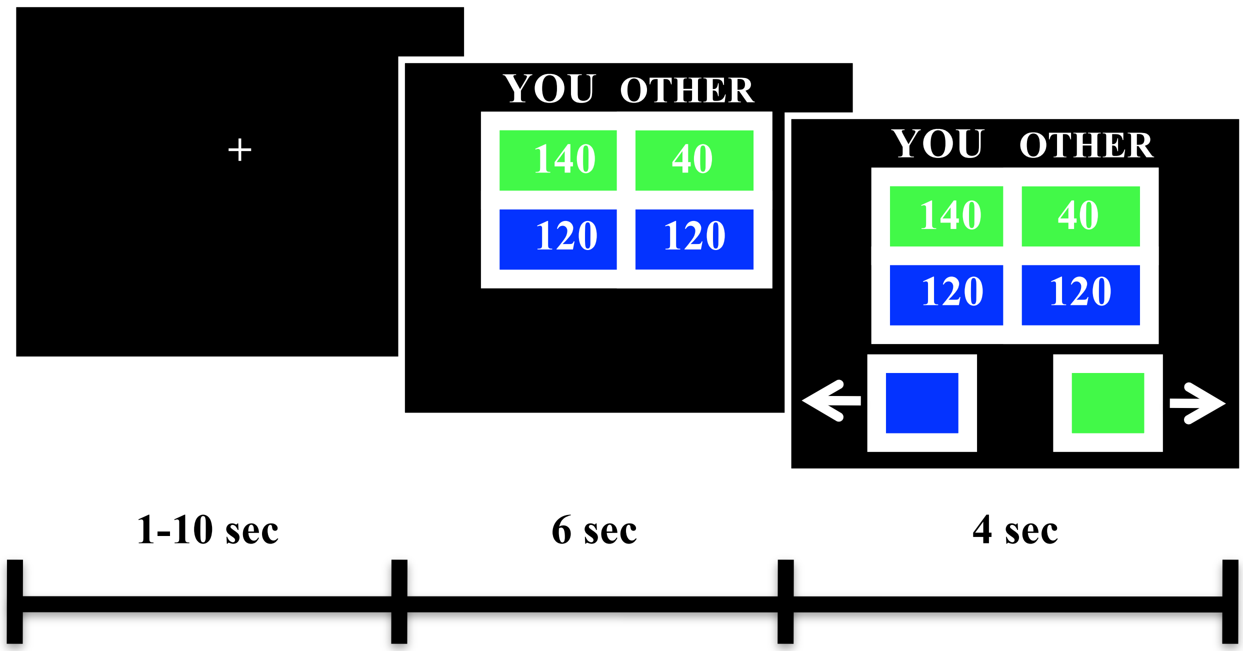

Figure 2. Timing and Presentation of Allocation Choices

The *political treatment* began with a survey of subjects' political affiliations and opinions. Subjects were first asked their political affiliations as Democrat, Republican, Independent, or None. They were then asked to refine their political leanings—strong, moderate, or closer to Democrat, closer to Republican. The exact slides and wording are provided in the Appendix. Subjects were then asked their opinions on issues that were dividing the political spectrum in the United States at that time, as well as their preferred media outlets.[14] Based on their answers, subjects were assigned to two groups. Subjects were given information on the percent of subjects in their assigned group that made similar chooses in the survey and the percent of subjects in the other group that expressed different opinions. Note again that there was no deception in this experiment, and we divided the subjects into groups according to an algorithm that would place Democratic and Democratic party-leaning subjects in one group and Republican and Republican

14. The issues were abortion, illegal immigration, large government, gay marriage, and the Bush tax cuts. The Appendix provides summary statistics of the political affiliations, leanings, and opinions of the subject pool.

party-leaning subjects in the other group. The information the subjects received was true data about the opinions held by subjects in the groups. Subjects were then asked to allocate money to themselves and to participants in their own or other group, as well between two subjects in their own group and the other group. The screens indicating YOU-OWN, YOU-OTHER, and OWN-OTHER had exactly the format as in the minimal group treatment.[15]

For each kind of match, subjects were presented with twenty-six different 2x2 allocation matrices. The collection of these matrices, and subjects' choices on each matrix in each condition, can be found in the Appendix, and Figure 2 provides an example. Following Charness & Rabin (2002), we constructed these matrices to capture three basic types of social preferences. The subjects could, at possible expense to self, (1) increase fairness, measured by the similarity of absolute payoffs, (2) increase social welfare, measured by the sum of absolute payoffs, or (3) increase own status/dominance, measured as the difference between own and other subject's payoffs. The matrices could involve more than one motive a time: For example, in the matrix in Figure 2, a subject who picked the bottom vector would both be increasing social welfare and increasing fairness at a personal cost. The econometric estimation of social preferences distinguishes among these motives. The total of twenty-six different matrices were presented to each subject in random order, and in random matches, in each condition. The vectors within each matrix were randomized, so that sometimes the top vector gave the subject more money than the bottom vector, or vice versa. The colors of the vectors, blue and green, as well as the left and right keys, were all randomized.

In addition to the show-up fee of $6, subjects received payment for one choice selected at random from each of the three sections of the experiment—non-group, minimal group, and political group. The points in the matrix were translated into dollars according to a conversion

15. The Appendix describes the procedure and the information subjects received about the other participant's answers to survey questions. In all other ways the matching is anonymous, and the recipient could be from another session of the experiment.

factor, and subjects earned about $15 for the one-hour sessions.

In the analysis below, we divide the subject pool according to their answers to the political survey. Table 1 shows the distribution of subjects' party affiliations and non-affiliations. Just under half of the subjects are Democrats (48%) and only 13% are Republicans. Independents and None of the Above make up more than one third of the subjects (39%). Of these, 62% are Democratic-leaning. The subject pool matches the political spectrum of undergraduates at Princeton, the one peer institution for which we could find survey data,[16] and nationally this age cohort is largely Democratic.[17] Overall the majority (by at least 10 percentage points) of North Carolina's population is Democratic or "leans" Democratic, [18] with a concentration where Duke is located and in the region.[19]

Table 1: Distribution of Political Affiliations and Leanings

POLITICAL CATEGORY	% OF SUBJECTS
Democrat – Strong	15
Democrat – Moderate	33
Republican – Strong	0
Republican – Moderate	13
Independent – Dem leaning	13
Independent – Rep leaning	10
None of the Above – Dem leaning	11
None of the Above – Rep leaning	5

Because they behave similarly in the experiment, and for ease of exposition, we group together and call "Independent" any subject who responded as either Independent or None of the Above.

[16] http://www.dailyprincetonian.com/2008/11/04/21969/
[17] http://www.people-press.org/2011/11/03/the-generation-gap-and-the-2012-election-3/
[18] http://www.gallup.com/poll/114016/state-states-political-party-affiliation.aspx
[19] Durham County and neighboring Orange County, where the University of North Carolina at Chapel Hill is located.

We will write Democratic-leaning Independents as D-Independents and Republican-leaning Independents as R-Independents.

We divide the subject pool to test whether different populations have different reactions to the two group treatments. We ultimately compare Democrats and D-Independents, for two reasons. First, most of the subjects are Democrats or D-Independents, with only small, absolute and relative, numbers of subjects calling themselves Republicans or answering they are closer to the Republican party (13% and 15% of the subjects respectively). Second, a large fraction of Democrats report "strong" affiliation to the Democratic party, implying a possibly large divergence between Democrats and D-Independents in terms of group affiliation. Thirty-one percent of Democrats self-report as "strong" Democrats; no Republicans self report as "strong." While subjects were not told these actual numbers, they arguably would have a sense of the political spectrum on campus, in the community, and among their peers, largely defined.

Before analyzing the results, we discuss possible experimenter demand effects, i.e., subjects might behave according to what they think the experimenter desires of them. In this experiment, for example, subjects might think that we (the experimenters) are calling attention to group divisions and therefore might try to act according to what they think we want them to do. We have several responses to this criticism. First, the aim of this experiment is precisely to see how people behave when groups are made salient. Many real-world actors create and exploit group divisions to their own advantage. Second, if there is a demand effect, there is no general agreement among subjects as to what the demand is, as there is a wide range of subject behavior. Finally, if there is a demand effect, there is no reason to believe that the demand effect would be different for the minimal group treatment and the political treatment. Hence, we control for any demand effect when comparing those two treatments, and indeed we do not see any significant difference in behavior for subjects who received the minimal group treatment first rather than the political group first.

III. Subjects' Choices across Conditions: Descriptive Overview

This section provides an overview of subjects' choices in the experiment. We begin by discussing the matrices presented to subjects, and how choices on these matrices can represent different social preferences. We then take a non-structured look at the data to discern patterns in individual choices across experimental conditions.

III.A. *Matrices and Social Preferences: Tradeoffs between Own and Other's Payoffs*

Each matrix involves a tradeoff between own payoffs and the payoffs that accrue to another subject. When presented with a matrix, subject *i* chooses one of two payoff vectors $(\pi_{i,}\, \pi_j)$ and $(\pi'_{i,}\, \pi'_j)$. For purposes of analysis, we will represent the choice between vectors $(\pi_{i,}\, \pi_i)$ and $(\pi'_{j,}\pi'_j)$ as a normalized matrix

π_i	π_j
π'_i	π'_j

where the decision-maker, *i*, earns weakly more money in the top row than the bottom. (As reported above, in the actual experiment the rows were randomized.) Subject *i* who chooses the bottom row loses $\pi_i - \pi'_i \geq 0$ and *j* gains or loses $\pi_j - \pi'_j$.

The matrices, and the tradeoffs they embody, are designed to capture different social preferences. For a normalized matrix, when a subject chooses the top vector, we say his choice is consistent with being "selfish" since $\pi_i \geq \pi'_i$. A subject who chooses the bottom vector is giving up own payoffs to help or hurt another subject. We say the choice of the bottom vector is consistent with being "fair" if the difference in payoffs between the bottom and top vector is smaller, i.e., $|\pi'_i - \pi'_j| < |\pi_{i,} - \pi_j|$. Choosing the bottom is consistent with "maximizing social welfare" if the sum of payoffs is higher; i.e., $\pi'_i + \pi'_j > \pi_{i,} + \pi_j$. Finally, choosing the bottom vector is "dominance-seeking" if it increases *i*'s relative payoffs; i.e, $\pi'_i - \pi'_j > \pi_{i,} - \pi_j$. Note that choice of the bottom vector (π'_i, π'_j) could be consistent with more than one of these objectives at the same time. The analysis and utility function estimation below uncovers the weights individuals may place on different objectives.

III. B. *Descriptive Analysis of Choices*

In this section, we describe subjects' choices in the experiment, across conditions. To do so, we conduct a factor analysis of the data. This analysis reveals sets of matrices, where subjects treat the matrices in each set similarly. The analysis also produces sets of subjects, who behave similarly in the experiment.

We establish the following regularities. First, individual subjects are generally consistent in their choices, and there is significant heterogeneity across subjects. There are subjects who tend to make dominance-seeking choices, whenever such matrices are presented. There are other subjects who tend to make fair/social welfare-maximizing choices, whenever such matrices are presented. These sets of subjects do not overlap—subjects who consistently make dominance-seeking choices do not fair choices, and vice versa. The dominance-seeking subjects do not make fair choices even when being unfair does not give them relatively higher payoffs. Second, there is differential response to the group treatments. On average, individuals become less fair and more dominance-seeking when allocating income to subjects in the other group. But looking at individuals, many do not change their behavior. This differential responsiveness is related to whether an individual reports being politically independent.

III. C. i. *Factor Analysis and "Similar" Matrices*

We begin with a factor analysis of subjects' choices, using data from the Non-Group condition. For the twenty-six matrices and 141 subjects, we estimate the following model with two factors:

$$d_{1i} = \mu_1 + l_{1,1} f_{1i} + l_{1,2} f_{2i} + \varepsilon_{1i}$$

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$$d_{26i} = \mu_{26} + l_{26,1} f_{1i} + l_{26,2} f_{2i} + \varepsilon_{26i}$$

where,

$$d_{ki} = \begin{cases} 1, \text{ if person } i \text{ chooses bottom vector in matrix } k \\ 0, \text{ Otherwise} \end{cases}.$$

The model has twenty-six estimated values of $\mu, (\mu_1, ..., \mu_{26})$, of $l_1, (l_{1,1}, ..., l_{26,1})$ and of $l_2, (l_{1,2}, ..., l_{26,2})$; it also has 141 estimated values of $f_1, (f_{1,1}, ..., f_{1,141})$ and $f_2, (f_{2,1}, ..., f_{2,141})$. The vector $(l_{k,1}, l_{k,2})$ contains the "factor loadings" for matrix *k*; the vector $(f_{1,i}, f_{2,i})$ contains the "factors" for person *i.*

We use the factor loadings to discern sets of "similar" matrices. By the analysis, matrices with similar factor loadings tend to have individuals making similar choices in those matrices; that is, if two matrices have similar factor loadings then individuals that choose the top (bottom) row in one will also choose the top (bottom) row in the other. To see this, consider an example where matrix 6 has $l_{6,1} > 0, l_{6,2} < 0$ and matrix 7 has $l_{7,1} > 0, l_{7,2} < 0$. If individual *i* has $f_{1,i} > 0$ and $f_{2,i} < 0$ this individual will tend to choose the bottom in both matrix 6 and 7 more often then would an individual *k* who had $f_{1,i} < 0$ and $f_{2,i} > 0$.

Figure 3 plots the factor loadings for each of the twenty-six matrices. The horizontal axis is factor 1 and the vertical access is factor 2. Figure 3 contains some obvious patterns. First, all of the matrices that give an individual the opportunity to be dominance-seeking have similar factor loadings – factor loading 1 is strongly negative and factor loading 2 is strongly positive (upper left hand corner). That is, for the matrix {[140 120],[100 0]}, people that choose the bottom vector also choose the bottom vector for the matrices {[140 140],[120 0]}, {[140 140],[120 80]}, {[140 100],[80 0]} and {[100 100], [100 20]}. In each case, choosing the bottom involves giving up money in order that (1) the other subject has even less money and (2) the allocation is less equitable. In the other corner (lower right hand corner) is a set of matrices where factor loading 1 is strongly positive and factor loading 2 is near zero or negative. These matrices all have the following property: choosing the bottom vector entails losing money in order that (1) the other subject is better off and (2) the allocation is more equitable (e.g. {[140 80],[120 120]}, {[160 80],[140 160]}, {[140 40],[120 120]} and {[140 20],[120,100]}).

Second, the two factor loadings are strongly negatively correlated. People who choose the bottom for the dominance-seeking matrices tend to choose the top for the fair matrices; that is

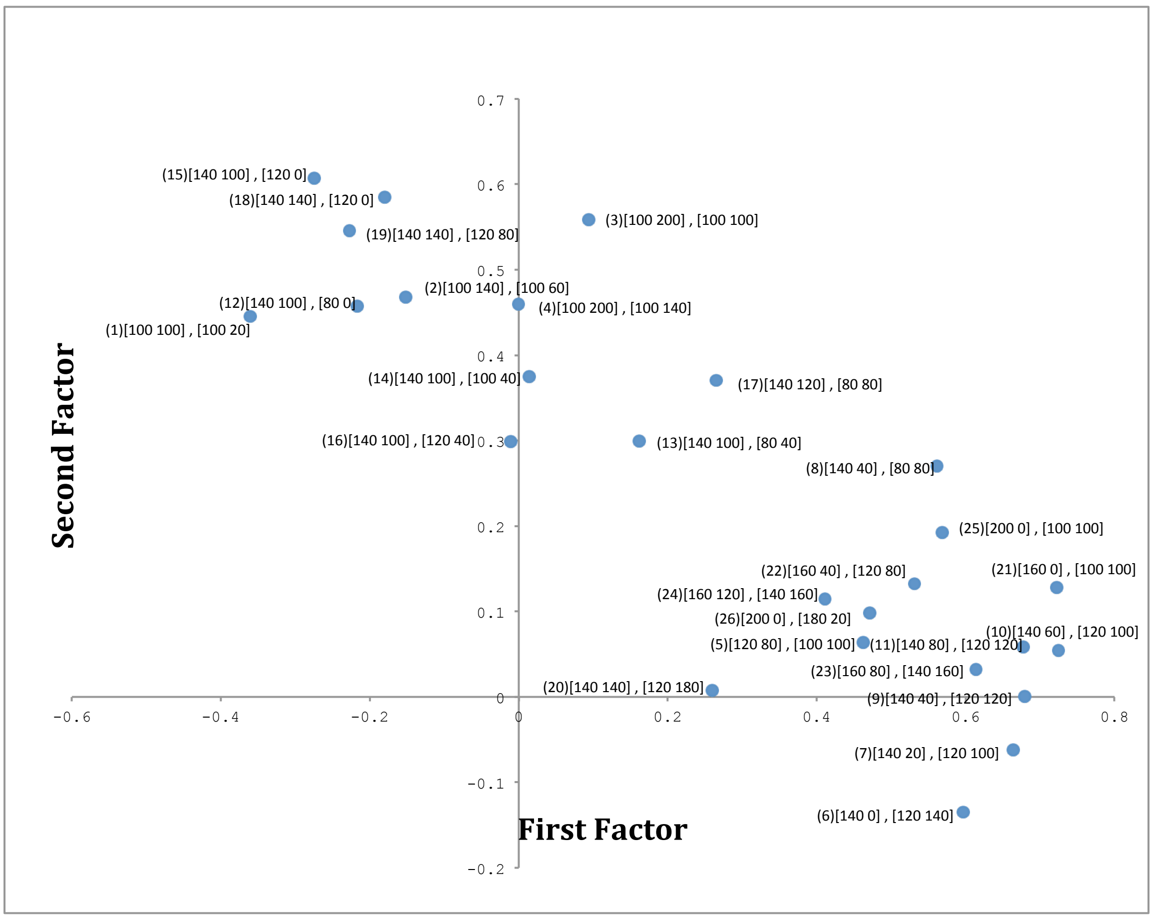

Figure 3: First Two Factors for 26 Matrices in **Non-Group Condition**

individuals that make dominance-seeking choices are also unfair. To see this, consider an individual with $f_{1,i} < 0$ and $f_{2,i} > 0$. This individual will tend to choose the bottom for the matrix

{[140 100], [120 0]} since $l_1 < 0, l_2 > 0$; that is, she will give up 20 to have the other subject lose 100. This same individual will tend to choose the top (i.e., less likely to choose the bottom) for the matrix {[140 20], [120 100]} since $l_1 > 0, l_2 < 0$; that is, she will not give up 20 to give the other subject a gain of 80.

Working from the factor loadings, we divide the matrices into four clusters of "similar" matrices. Cluster A is the six matrices in the upper left hand corner of Figure 3—1, 2, 12, 15, 18, and 19. Cluster D is the matrices in the lower right hand corner of Figure 3—6, 7, 10, 11, 21, and 23. The remaining matrices in the middle of Figure 3 are divided into two clusters – B which includes matrices 3, 4, 12, 14, 16, and 17, and C which includes 5, 8, 20, 22, 24, 25, and 26.

While the matrices were subdivided into these clusters based on the factor analysis, Table 2 shows that these clusters have substantive meaning and can be interpreted in terms of social preferences. Column 1 presents, on average across the matrices in the cluster, the loss to *i* when *i* chooses the bottom vector. Column 2 presents the average loss or gain to *j* when *i* chooses the bottom vector—positive numbers are gains and negative numbers are losses. Column 3 is the "relative price" of the gain or loss to *j*; it measures how much *i* loses for a gain (loss) for *j*. For example, on average in Cluster A it costs 21 units for a one unit reduction in the other subject's payoffs; in Cluster D it costs 32 units for a one unit gain in the other subject's payoffs. Columns 4 through 6 record the percentage of matrices within the cluster such that choosing the bottom vector is more (4) fair, (5) social welfare maximizing or (6) dominance-seeking.

Table 2: Statistics for Four Clusters of Matrices

Matrix Cluster	$\Delta\pi_i$	$\Delta\pi_j$	Relative Price $-\Delta\pi_i/\Delta\pi_j$	% Fair	% SWM	% Dom
A	-20	-93.3	-0.21	0	0	100
B	-30	-63.3	-0.47	50	0	66
C	-40	43.9	0.91	86	29	0
D	-25.7	80	0.32	100	100	0

In summary, A matrices are characterized by a low price of dominance; D matrices are characterized by a low price of fairness and social welfare maximizing behavior. B and C matrices have higher prices. In C matrices, the bottom vectors involve fairer payoffs, but are less often social welfare maximizing. In B matrices, *j* has lower payoffs in the bottom vector; for half the matrices the bottom vector is a more equitable outcome, while for two-thirds of the matrices it increases *i*'s dominance.

III. C. ii. *Individual Choices for "Similar" Matrices – Non-Group Control*

Given this classification of matrices, we turn next to subjects' choices in the non-group condition.

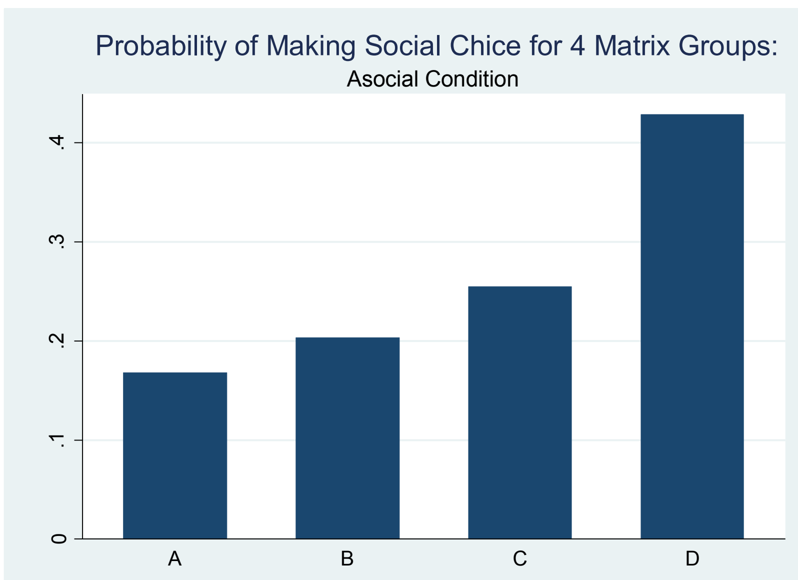

Figure 4: Probability of Choosing Bottom Row, by Matrix Cluster, in Non-Group Condition

Figure 4 summarizes overall subjects' choices in the Non-Group (aka Asocial) condition. It gives the probability subjects choose the bottom vector, for matrices in each cluster A, B, C, and D. Figure 4 shows, first, dominance seeking choices are clearly in the data. Subjects choose the bottom vector about 18% of the time for matrices in set A. Second, subjects appear to be price-sensitive. Comparing clusters C vs. D, we see the fraction choosing the bottom vector is smaller for C matrices. (While the price is higher for cluster B than A, the social objectives are different; for some matrices within B an individual who chooses the bottom row increases fairness.)

Looking at the "factors" for each individual, we can discern the heterogeneity of individual choices in the experiment. Figure 5 plots the two factors $\left(f_{1,i}, f_{2,i}\right)$ for each of the 141 subjects. The two vertical and horizontal lines divide the subjects into nine groups. The two vertical lines represent the 25th and 75th percentile of $f_{1,i}$ and the two horizontal lines represent the 25th and 75th percentile of $f_{2,i}$. We number the grid from 1-9 where Group 1 is in the upper left hand, Group 3 in the upper right hand corner and Group 9 in the lower right hand corner.

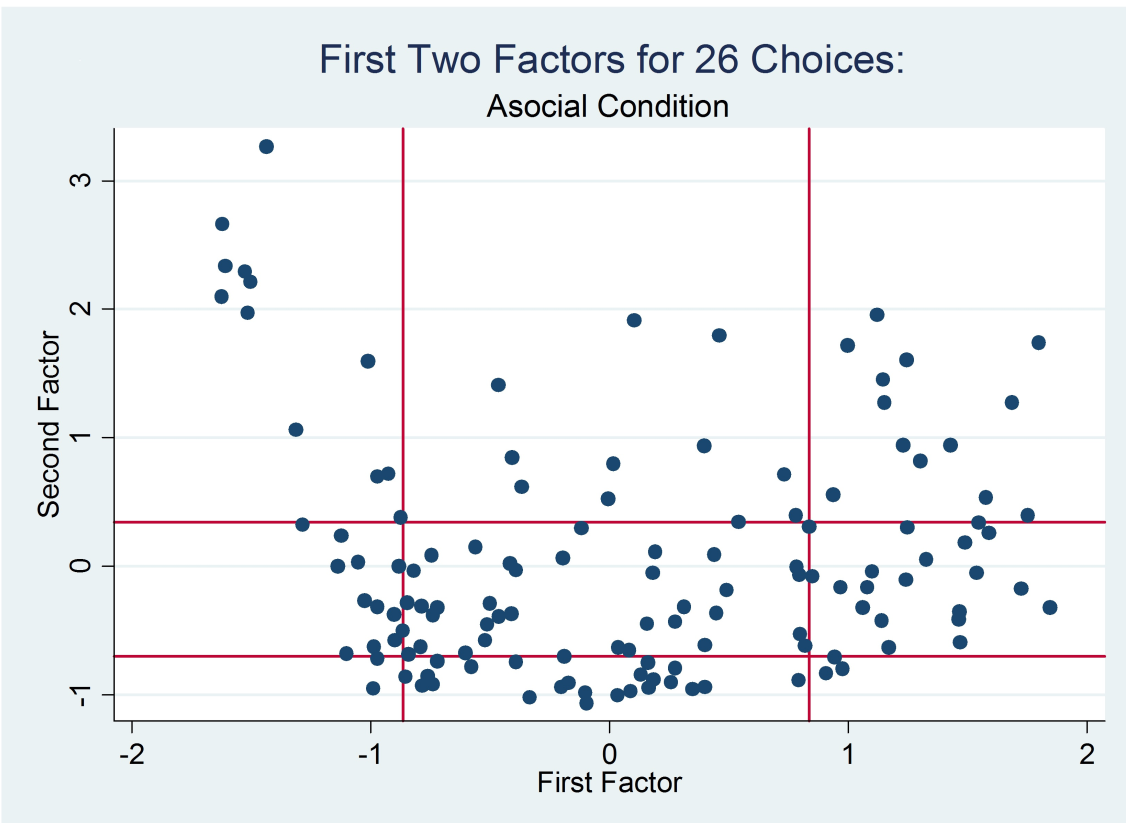

Figure 5: Plot of Individual Subjects' Factors for Choices in Non-Group Condition

We then study the choices of subjects in these groups, for different clusters of matrices, as shown in Table 3. Looking at play for individuals in groups 1, 2 and 3 (or 4, 5 and 6) shows the effect of a higher value of the first factor holding constant the second. It is clear that a higher value of the first factor raises the chances of making the fair/social welfare maximizing choice (Matrix Cluster D) and lowers the chances of making the dominance seeking choice (Matrix Cluster A). For example, subjects in Group 1 pick the fair/social welfare maximizing choice 3.6% of the time while subjects in Group 3 picks it 83.5% of the time; at the same time subjects in Group 1 pick the dominance-seeking choice 76.4% of the time while subjects in Group 3 picks it 23.1% of the time. Comparing Groups 1 and 4 (or 2, 5 and 8 or 3 and 6) shows the effect of a higher value of the second factor holding constant the first. It is clear that the second factor has a limited role in the chances of making the fair/social welfare maximizing choice (Matrix Cluster D) and but a larger role the chances of making the dominance seeking choice (Matrix Cluster A).

	Matrix Cluster			
Group Number	A	B	C	D
1	76.4%	38.9%	6.0%	3.6%
2	36.4%	31.8%	36.4%	49.4%
3	23.1%	53.8%	63.7%	83.5%
4	21.1%	15.6%	4.8%	1.0%
5	10.0%	19.0%	21.2%	37.6%
6	5.0%	17.5%	57.1%	90.7%
7 to 9	0.0%	2.4%	10.2%	35.9%
Total	16.9%	20.2%	25.6%	43.1%

Table 3: Consistency of Subjects' Choices for Matrix Clusters

For example the fraction making the fair/social welfare maximizing choice in Groups 1 vs. 4 is 3.6% vs. 1.0%; the fraction making the dominance-seeking choice in Groups 1 vs. 4 is 76.4% vs. 21.1%. Group 8 (7 to 9) is of some interest as well. It appears that these people are selfish in the sense that they rarely are willing to give up tokens for any social objective (they are at times willing to act fairly (matrix cluster D) but close inspection suggests that this occurs typically when there is no loss in doing so). Finally comparing Group 1 to 6 gives an idea of the extremes of heterogeneity of play. Group 1 is dominance-seeking and unwilling to be fair/social welfare maximizing even when it is cheap; Group 6 is rarely dominance seeking and is willing to be fair/social maximizing when it is expensive (Matrix Cluster C) and even more so when it is cheap. These data highlight a central message of this paper – while people are "on average" willing to lower their payoff to raise the payouts of others, this masks enormous heterogeneity; many individuals are selfish and unwilling to lower their payoff for any social objectives, while others are willing to lower their payoffs but only to harm the other subject.

III.C. iv. *Choices across Conditions for "Similar" Matrices*

Again using the clusters of "similar" matrices, we compare subjects' choices in the three experimental conditions: non-group (aka asocial), minimal group, and political group. Figure 6 shows the fraction of subjects that choose the bottom vector for each matrix cluster, in each condition for You-Other matches. In group treatments, more subjects make dominance-seeking choices (sets A and B), and fewer subjects make fair/social welfare maximizing choices (sets C and D). The political treatment shows the greatest divergence from the non-group condition.

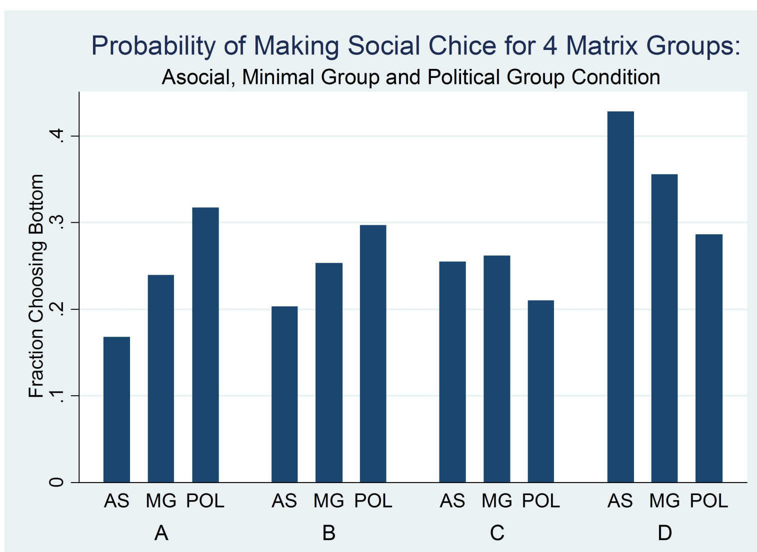

Figure 6: Subjects' Choices in Each Experimental Conditions

Breaking down these data into subject pools reveals the differential response to group treatments. Figure 7 shows Democrats and D-Independents choices in the non-group, minimal group, and political group conditions, for You-Other matches. Democrats and D-Independents appear to have similar choices in the non-group condition. But while Democrats' choices change in the minimal group treatment, D-Independents' choices change little. In the political treatment, however, D-Independents make more dominance seeking choices and fewer social welfare-maximizing choices, like Democrats, though not as frequently. Hence, we see a well-defined subset of the population that appears non-responsive to arbitrary group divisions, but responsive to a group division that is socially meaningful.

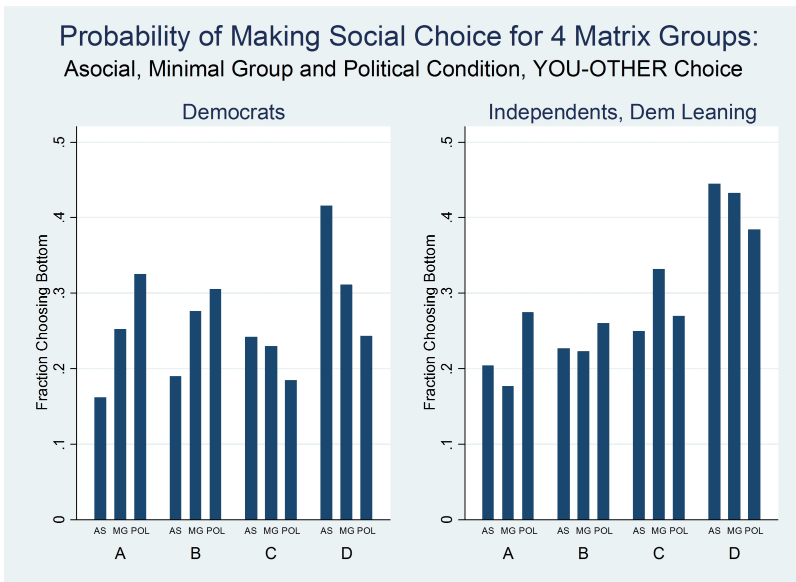

Figure 7: Democrats and D-Independents Choices across Conditions

IV. Individual Social Preferences and Identity

This section considers structural estimation of individual social preferences and tests whether identity relates to these preferences. We do so by positing a utility function, estimating "types" of social preferences using a mixing model, and categorizing individuals by type. We consider the distribution of these types and how the distribution changes across experimental conditions, for given subjects.

IV.A. *Structural Estimation Strategy*

Suppose individuals care about their own payoffs and care about others' payoffs, possibly in relation to their own. Individual i's utility is then some function of own and the other's payoffs: $U_i(\pi_i, \pi_j)$. There are many different specifications of such a utility function in the literature (e.g., Andreoni & Miller (2002), Bolton & Ockenfels (2000), Fehr & Schmidt (1999)). For comparison with previous studies, we adapt the utility function proposed by Fehr & Schmidt (1999) and Charness & Rabin (2002). This specification also allows for a range of behavior, including dominance-seeking behavior.

Suppose individual utility depends on own payoffs, π_i, and the divergence between own and other's payoffs, $(\pi_i - \pi_j)$. Also suppose that utility from $(\pi_i - \pi_j)$ depends on whether $\pi_i \geq \pi_j$ or the reverse. Let

$$U_i(\pi_i, \pi_j) = \beta_i\pi_i + \rho_i(\pi_i - \pi_j)r + \sigma_i(\pi_j - \pi_i)s$$

where β_i is the weight placed on own income, ρ_i is the weight on relative income when $\pi_i \geq \pi_j$, r is an indicator variable for $\pi_i \geq \pi_j$, σ_i is the weight on relative income when $\pi_i < \pi_j$, and s is an indicator variable for $\pi_i < \pi_j$. Notice that, in principle, this utility function allows each individual to differ on the weight placed on own income, the weight on relative income when $\pi_i \geq \pi_j$ and the weight on relative income when $\pi_i < \pi_j$. In practice, however, when this utility function is estimated, the focus is typically on "the average" weight placed on these terms; that is the coefficients are restricted to be fixed across individuals.

This utility function is simple and captures social preferences described in the literature, yet it is linear and thus does not allow for the diminishing marginal utility in π_i or $(\pi_i - \pi_j)$. Given the price-sensitivity shown above, this utility function does not accurately capture subjects' behavior. To correct for this, we also conduct our analysis for polynomial specifications of $U_i(\pi_i, \pi_j)$. The polynomial estimation yields more precise parameter estimates, but it does not change the distribution of types of social preferences, which is our main objective.

$\beta_i > 0$	$\sigma_i = 0$	$\sigma_i > 0$	$\sigma_i < 0$
$\rho_i = 0$	*Purely Selfish*	*Social Welfare Max*	*Fair/Status Seeking*
$\rho_i < 0$	*Fair/Soc Welf Max*	*Social Welfare Max*	*Fair*
$\rho_i > 0$	*Dominance-Seeking*	*Impossible*	*Dominance-Seeking*

Figure 8. Combinations of Utility Function Parameters

We can categorize social preferences by looking at the various combinations of the parameters, as seen in the chart in Figure 8. Given $\beta_i > 0$, if $\rho_i = \sigma_i = 0$ then an individual places no weight on anyone else's payoff; he is *(purely) selfish*. If $\rho_i > 0$ and $\sigma_i > 0$, utility is always increasing in both π_i and π_j, we say an individual is a *social welfare maximizer*. If $\rho_i < 0$ and $\sigma_i < 0$, social preferences are for "fairness," since utility is always increasing when π_i and π_j are closer together. If $\rho_i > 0$ and $\sigma_i < 0$, then utility always increases when i earns more than j; and we say people with these preferences are *dominance seeking*.

As we discussed, while a central question is individual heterogeneity, in practice a single set of utility functions parameters is almost always assumed for all individuals. This assumption gives results "on average" that individuals play, say, fairly, but precludes heterogeneity in play across the population. There is a simple reason that individual specific parameters are typically not estimated—the number of decisions an individual would need to make in order to precisely estimate such individual heterogeneity is likely not feasible in an experimental setting.

As compromise strategy, rather than presume there is a single set of utility function parameters that represent the preferences of all individuals, we allow for the possibility that there are different "types" of people, where each type t has distinct preferences. With our design, we have panel data (multiple choices for each individual), and thus it is possible to estimate a finite mixture model, also called a latent class model. A finite mixture model allows for a finite number of types in the population, where each type t is characterized by different parameter values (β_t,

ρ_t,σ_t). We estimate four types, i.e., four sets of utility function parameters (β_1, ρ_1,σ_1), (β_2, ρ_2,σ_2), (β_3, ρ_3,σ_3), (β_4, ρ_4,σ_4).

While we estimate four types, it is important to emphasize that it is the data that gives us the utility parameters for each type. That is, there is no presumption, a priori, that the types will map into the four different motives outlined above. We choose four because it is the minimum number that could captures for the four distinct motives outlined above. Five or more types lead to very small number of individuals in some types. After estimating four types, we classify each individual subject as a type. As we will see below, almost all individuals can be classified into one of the four types with a probability close to 90%.

Formally, let p_t indicate the proportion of the population of type t and let each parameter of the utility function be subscripted by *t*; β_t,σ_t,ρ_t are the three main parameters of interest for type *t*. The mixture model then has a total of fifteen parameters to estimate: three utility parameters for each of the four types and three mixing probabilities, where the complement gives us the proportion of the fourth type.

If we knew each individual's type, we could just estimate a binary choice model for choosing the bottom. For example, if we assumed an extreme value distribution for the error terms, we have the well-known logit model, which could be estimated on type *t* individuals by maximizing the following likelihood function:

$$L\left(\beta_t,\sigma_t,\rho_t\right)=\prod_{i=1}^{141}\prod_{k=1}^{26}\Lambda_{\mathrm{ki}}\left(\beta_t,\sigma_t,\rho_t \mid \pi_i,\pi_j\right)^{\mathrm{d_{ki}}}\left(1-\Lambda_{\mathrm{tk}}\left(\beta_t,\sigma_t,\rho_t \mid \pi_i,\pi_j\right)\right)^{\left(1-\mathrm{d_{ki}}\right)}$$

where $\left(U_{ki}^{bot}-U_{ki}^{top} \mid \beta_t,\sigma_t,\rho_t\right)=\begin{pmatrix}\beta_t\left(\pi_{i,k}^{bot}-\pi_{i,k}^{top}\right)+\\ \rho_t\left(\left(\pi_{i,k}^{bot}-\pi_{j,k}^{bot}\right)\times r^{bot}-\left(\pi_{i,k}^{top}-\pi_{j,k}^{top}\right)\times r^{top}\right)+\\ \sigma_t\left(\left(\pi_{j,k}^{bot}-\pi_{i,k}^{bot}\right)\times s^{bot}-\left(\pi_{j,k}^{top}-\pi_{i,k}^{top}\right)\times s^{top}\right)\end{pmatrix}$ and

and $\Lambda_{\text{ki}}\left(\beta_t,\sigma_t,\rho_t\right)=\exp\left(U_{ki}^{bot}-U_{ki}^{bot}\right)\Big/\left(1+\exp\left(U_{ki}^{bot}-U_{ki}^{bot}\right)\right)$. The issue we face is that we do not know an individual's type. Instead, we posit that each individual has to be one of a finite number of types (here, four). Therefore, in the likelihood function we can condition on an individual being of a type and then integrate over the distribution of types. That is, we estimate:

$$L\left(\beta_t,\sigma_t,\rho_t\right)=\prod_{i=1}^{141}\prod_{k=1}^{26}\sum_{t=1}^{4}p_t\Lambda_{\text{ki}}\left(\beta_t,\sigma_t,\rho_t\,|\,\pi_i,\pi_j\right)^{\text{d}_{\text{ki}}}\left(1-\Lambda_{\text{tk}}\left(\beta_t,\sigma_t,\rho_t\,|\,\pi_i,\pi_j\right)\right)^{\left(1-\text{d}_{\text{ki}}\right)}$$

where p_1,p_2,p_3,p_4 are estimated along with the utility parameters.[20]

Having estimated this model, it is straightforward to estimate the *posterior* probabilities that any person *i* is of type *t*. Under the estimated parameters, we can calculate the probability of each choice *k* for person *i* if *i* were type *t* just using $\Lambda_{\text{tk}}\left(\beta_t,\sigma_t,\rho_t\,|\,\pi_i,\pi_j\right)$. Given the full sequence of choices that person *i* actually made, we can calculate the probability of making those choices if person *i* is type *t* as

$$\Gamma_t\left(\beta,\sigma,\rho\right)=\prod_{k=1}^{26}\Lambda_{\text{tk}}\left(\beta_t,\sigma_t,\rho_t\,|\,\pi_i,\pi_j\right)^{\text{d}_{\text{ki}}}\times\left(1-\Lambda_{\text{tk}}\left(\beta_t,\sigma_t,\rho_t\,|\,\pi_i,\pi_j\right)^{\left(1-\text{d}_{\text{ki}}\right)}\right)$$

Using Bayes rule, and using the estimated mixing proportions p_1, p_2, p_3, p_4 as a prior of being type *t*, the posterior probability that *i* is type *t* is just

$$P_t=\frac{\text{p}_\text{t}\Gamma_t\left(\beta,\sigma,\rho\right)}{\sum_{t=1}^{4}\text{p}_\text{t}\Gamma_t\left(\beta,\sigma,\rho\right)}$$

We then categorize individuals as type t based on their posterior probability of being type *t*. In particular, we assign *i* type *t* if $P_t=max\left\{P_1\ldots P_4\right\}$.

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[20] We do this by modeling the mixing distribution as logistic function with a constant. That is, the probability of being of type 1, 2 or 3 i $\text{p}_\text{t}\left(\theta_1,\theta_2,\theta_3\right)=\dfrac{exp\left(\theta_t\right)}{1+\sum_{g=1}^{3}exp\left(\theta_t\right)}$

and $\text{p}_4\left(\theta_1,\theta_2,\theta_3\right)=1-\left(\text{p}_1+\text{p}_2+\text{p}_3\right)$. $\theta_1,\theta_2,\theta_3$ is now estimated along with the utility parameters.

IV. B. *Distribution of Individual Social Preferences*

We find there is a precise division of the population into types, each with distinct social preferences. Table 4 reports the social preferences for four types estimated from subjects' choices in the non-group condition.

<Table 4 about here.>

Following the typology in the chart in Figure 8, we categorize the types as: "selfish," "social welfare maximizing," "fair" and "dominance-seeking." The last column in Table 4 provides the estimates social preferences under the assumption that the utility parameters are fixed across all individuals. Thus, in our sample, "on average" subjects are fair.

<Table 5 about here.>

We assign each individual to a type according to the highest posterior probability that this subject is of that type. Table 5 shows that these posterior probabilities type assignment are above 90% for all but a few subjects. The best estimated type assignment is for the dominance-seeking type; each subject designated as dominance-seeking has 100% probability for being of this type. Assignment to selfish is almost as precise, with all but one subjects having above a 90% posterior probability of being of this type. Social welfare maximizers and fair types are only a bit less precisely assigned; this slightly smaller precision is due to the fact that these types exhibit somewhat similar behavior, which is less distinctive than selfish and dominance-seeking behavior.

This assignment gives the distribution of the social preferences in our population. In the non-group condition, 25% of subjects are selfish, 36% are social welfare maximizers, 34% are fair, and 5% are dominance-seeking.[21]

IV. C. *Social Preferences and Group Divisions*

21. All the qualitative results we describe below hold for a more detailed distribution, where individual classification is a weighted average of their posterior probabilities of being of each type.

This section asks how group divisions affect the distribution of types in the population. The premise is that people may switch from one "type" to another "type" given the particular social context. A person who is "fair" in the non-group condition, for example, could be "selfish" in the group treatment when allocating income to someone outside his group. We classify each individual's behavior as a type in each of the group treatments, by match, as seen in Table 6.

<Table 6 about here.>

Within each group treatment, we easily see that more subjects are dominance-seeking vis a vis out-group members than in-group members. In the minimal group treatment, in You-Other matches, 16% of subjects are dominance-seeking, compared to 4% in You-Own matches. The pattern in the political treatment is a similar and more pronounced (21% vs. 1%). For You-Other matches, there is also less "social welfare maximizing" and "fair" behavior.

We can discern a pattern in these cross condition and with-in condition differences. Comparing the non-group control to the group treatments, we see the distribution does not change much for You-Own matches. There is a shift from social welfare maximizing to fairness: In MG-You-Own matches, compared to the non-group condition, fewer subjects are "social welfare maximizers," 27% vs. 37%, and more subjects are "fair," 40% vs. 33%. For You-Other matches, on the other hand, there is a large difference in the distributions; many more subjects are "selfish" and "dominance-seeking." For MG-You-Other matches, 30% of subjects are "selfish" and 16% are dominance-seeking. For POL-You-Other matches, 35% of subjects are "selfish" and 21% are dominance-seeking. Fewer subjects are "social welfare maximizers," with only 21% in MG You-Other matches and 13% in POL-You-Other matches.

Table 7 reports on the Chi-squared tests, which indicate, for the population, that most of the group treatment effect is coming from the minimal group treatment. We can reject that the MG You-Other distribution is the same as the NG You-Other distribution and reject that the POL You-Other distribution is the same as the NG You-Other distribution. In addition, subjects in both group treatments distinguish between in-group and out-group members; we can reject that the MG-You-Own distribution is the same as the MG-You-Other distribution, and similarly for POL You-Own and POL-You Other. However, we are not able to reject that the MG distributions are the same as the POL distributions.

<Table 7 about here.>

<Table 8 about here.>

Table 8 provides the cross-tabulations, showing the switching described above; it gives the number of subjects that are type *x* in the non-group condition and type *y* in a group treatment, by match. Looking across conditions, it is evident that some subjects' behavior does not change according to social context. Subjects who are selfish in the non-group condition tend to stay selfish across all conditions and matches. We also see that subjects who are dominance-seeking in the non-group condition are dominance-seeking across conditions and matches. For these subjects, their social preferences do not depend on the particular social context.

For the rest of the subjects, social context appears to matter. Across conditions, many subjects who are social welfare-maximizing or fair become dominance-seeking or selfish in group You-Other matches. For example, of the 52 subjects who are social-welfare maximizing in the non-group treatment, only 17 are social-welfare maximizing in POL-You-Other matches; 16 become selfish and 11 become dominance-seeking. Within each group condition, that is comparing You-Own vs. You-Other in the group treatments, there is a similar pattern. For both the minimal group treatment and the political treatment, most selfish subjects in You-Own are also selfish in You-Other matches. But many subjects switch from fair or social welfare maximizing in You-Own matches to dominance-seeking in You-Other matches. For example, of the 67 subjects who are fair in POL-You-Own matches, only 39 are fair in POL-You-Other matches; 6 are social welfare maximizing, but 18 are dominance-seeking and 4 are selfish.

These results indicate that social preferences depend on the social context and there is a range of individual behavior. In the aggregate, subjects are "fair" in the non-group condition, and subjects are more "fair" or less "fair" in the group treatments depending on whether they face an in-group vs. out-group member.[22] But this aggregation masks individual regularities. When estimating individual social preferences, about half of the subjects are not fair or social welfare maximizing when allocating money to someone out their group—rather they seek to maximize their own payoffs or seek to maximize relative payoffs.

IV. D. *Differences in Responsiveness to Group Treatments and Identity*

Tables 9a, 9b, 9c, and 9d provides the distribution of social preferences for Democrats, Republicans, D-Independents, and R-Independents by condition and by match.

<Tables 9a-d about here.>

Democrats, Republicans, and R-Independents all respond to the minimal group treatment, in a similar way. The Chi-squared tests are reported in Tables 10a-d. We reject that the distributions of types are the same for NG-You-Other, MG-You-Other and MG-You-Own matches. All these subjects exhibit the typical behavior associated with minimal group, with a favoring of in-group members and disfavoring of out-group members. Furthermore, though we cannot reject that the distributions are the same, the political treatment appears stronger than the minimal group treatment for these three subsets of the subject pool.

For the D-Independents, however, the specificity of the group division is significant. These subjects behave similarly in the minimal group treatment as in the non-group condition.

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20. The last column of Table 4 presents Maximum likelihood estimation of the utility function parameters when they are restricted to be constant across groups. Looking back at Figure 8, the parameter estimates suggest that on average the population acts fair. Looking across rows of Table 4 is clear that this masks considerable heterogeneity in the population. As one example of how group setting affects utility parameters, for the population average $\rho = -0.0112$ and $\sigma = -0.00247$ indicating a dislike of inequality, more so when one has more than an opponent in the Asocial condition; when the same population average parameters are estimated when playing against an out-group member in the Minimal Group condition we find $\rho = -0.00342$ and $\sigma = -0.0108$; this indicates that having a higher payoff than ones opponent has less disutility in the Minimal Group condition while an opponent having a higher payoff than oneself has a greater disutility in the Minimal Group condition.

We cannot reject that the distribution of types is the same. Hence, it appears that D-Independents are not responsive to arbitrary group divisions.

In the political treatment, D-Independents do have a significantly different distribution of social preferences than in the non-group condition and the minimal group condition. They respond to the political group division. We can reject that for D-Independents, the distribution for the political treatment is the same as the distribution for the minimal group treatment or the non-group treatment. More subjects become dominance-seeking when facing a subject in the other group.

Thus, we see that that individual identities are key to group divisions. Not all individuals respond to arbitrary group divisions. The political treatment relies on the subjects' personal political identities. D-Independents do not respond to the minimal group treatment, perhaps reflecting a preference for not joining groups. But when facing subjects who are significantly different there are in terms of political identity (i.e., they identify with the Republican party and hold opposite political views), D-Independents adopt behavior in similar direction to those who respond to the minimal group.

V. Conclusion

This experiment is direct test of identity and social preferences. It demonstrates that group divisions can lead to behavior that destroys social welfare, even within a relatively privileged and collegial population. There is a diversity of social preferences, however, which is not only due to possible idiosyncratic preferences, but is related to participants' individual identities. This research supports the call for a richer model of individual choice—one that includes identity and group divisions as key variables.

This paper is the beginning of a research program to bring new methods and new content to the experimental research of group conflict, social preferences, and identity. Just as economics has begun to study identity and social variables in decision-making, there has been an explosion of research in the new field of social cognitive neuroscience. Researchers have identified neural and biological markers that track variables important to trustworthiness (Heinrichs et.al. (2005), King-Casas et. al. (2005)), interpersonal interactions (Singer et. al. (2006)), altruism (Tankersley et. al. (2007)), Harbaugh et. al. (2007)), and self- and other-directed thought and perception (Saxe (2006), Saxe et. al. (2003)). Yet, despite the many areas of topical and conceptual overlap between economic and psychological/neuroscientific research, there has been minimal contact between these fields. The experiment in this paper uses neuroscientific protocols, which allowed the analysis of individual variation in behavior. Further research will work in this intersection, with the aim for a richer, socially framed and biologically grounded economic theory would allow more accurate predictions of individual behavior and, hence, the consequences of public policies and interventions.

Table 4: Results from Mixing Model and Population Average
Utility Function Estimates and Proportions for Four Types in Non-group Condition

Utility Function Parameters	Type 1	Type 2	Type 3	Type 4	ALL
Beta	0.152***	0.0655***	0.0312***	0.0367***	0.0436***
	(0.0134)	(0.00441)	(0.00310)	(0.00980)	(0.00168)
Rho	-0.00372	-0.0144***	-0.0214***	0.0528***	-0.0112***
	(0.00254)	(0.00157)	(0.00138)	(0.0106)	(0.000655)
Sigma	0.00489*	0.00544**	-0.00747***	-0.0439***	-0.00247**
	(0.00287)	(0.00240)	(0.00240)	(0.0169)	(0.00124)
Observations	3,636	3,636	3,636	3,636	
Proportion of Type	25 %	36 %	34 %	5 %	
Category Implied by Parameters	SELFISH	SOCIAL MAX	FAIR	DOMINANCE SEEKING	FAIR

Notes:
1. Standard errors in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Posterior Probabilities of Being Classified Type in Non-group Condition

Posterior Probability of:	Obs.	Mean	Std. Dev.	Min	2^{nd} Low	Max
SELFISH (Type 1)	35	0.966	0.051	0.725	0.908	0.999
SOCIAL MAX (Type 2)	52	0.932	0.096	0.541	0.717	0.999
FAIR (Type 3)	47	0.971	0.067	0.588	0.865	1.000
DOMINANCE (Type 4)	7	1.00	0.000	1.000	1.000	1.000

Table 6: Distribution of Types, by Condition and Match
POPULATION

PANEL A: NON-GROUP

	YOU-OTHER	
Type	Freq.	Percent
SELFISH	35	25
SOCIAL MAXIMIZER	52	37
FAIR	47	33
DESTRUCTIVE	7	5
Total	141	100

PANEL B: MINIMAL GROUP

	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	40	28	42	30
SOCIAL MAXIMIZER	38	27	30	21
FAIR	57	40	47	33
DESTRUCTIVE	6	4	22	16
Total	141	100	141	100

PANEL C: POLITICAL GROUP

	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	42	30	50	35
SOCIAL MAXIMIZER	26	18	18	13
FAIR	71	50	43	31
DESTRUCTIVE	2	1	30	21
Total	141	100	141	100

Table 7: X-Squared Test of Differences in Distribution of Types, between conditions/match POPULATION

Comparison	Test Statistic	** P-Val < 0.05 * P-Val < 0.10
NG/AS: You-Other vs.:		
MG: You-Own	3.55	
MG: You-Other	14.30	**
POL:You-Own	16.96	**
POL:You-Other	33.64	**
MG: You-Own vs.:		
MG: You-Other	11.09	*
POL: You-Own vs.:		
POL: You-Other	33.53	**
MG: You-Own vs.:		
POL: You-Own	5.83	
MG: You-Other vs.:		
POL: You-Other	5.10	

Table 8: Cross Tabulations of Subjects' Types

	POL: You-Other				
NG: You-Other	SELF	SWM	FAIR	DOM	Total
SELFISH	28	3	0	4	35
SOCIAL WEL MAX	16	17	8	11	52
FAIR	1	5	33	8	47
DOMINANCE	0	0	0	7	7
Total	45	25	41	30	141

	MG: You-Other				
MG: You-Own	SELF	SWM	FAIR	DOM	Total
SELFISH	34	5	1	0	40
SOCIAL WEL MAX	4	20	9	5	38
FAIR	4	6	36	11	57
DOMINANCE	0	1	0	5	6
Total	42	32	46	21	141

	POL: You-Other				
POL: You-Own	SELF	SWM	FAIR	DOM	Total
SELFISH	34	3	0	4	41
SOCIAL WEL MAX	7	16	2	5	30
FAIR	4	6	39	18	67
DOMINANCE	0	0	0	3	3
Total	45	25	41	30	141

Table 9a: Distribution of Types, by Condition and Match
DEMOCRATS

PANEL A: NON-GROUP		
	YOU-OTHER	
Type	Freq.	Percent
SELFISH	15	22
SOCIAL MAXIMIZER	27	40
FAIR	21	31
DOMINANCE	5	7
Total	68	100

PANEL B: MINIMAL GROUP				
	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	18	26	20	29
SOCIAL MAXIMIZER	20	29	15	22
FAIR	26	38	20	29
DOMINANCE	4	6	13	19
Total	68	100	68	100

PANEL C: POLITICAL GROUP				
	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	18	26	26	38
SOCIAL MAXIMIZER	14	21	11	16
FAIR	34	50	15	22
DOMINANCE	2	3	16	24
Total	68	100	68	100

Table 9b: Distribution of Types, by Condition and Match
REPUBLICANS

PANEL A: NON-GROUP

Type	YOU-OTHER Freq.	YOU-OTHER Percent
SELFISH	3	17
SOCIAL MAXIMIZER	10	56
FAIR	5	28
DOMINANCE	0	0
Total	18	100

PANEL B: MINIMAL GROUP

Type	YOU-OWN Freq.	YOU-OWN Percent	YOU-OTHER Freq.	YOU-OTHER Percent
SELFISH	5	28	6	33
SOCIAL MAXIMIZER	10	56	3	17
FAIR	3	17	6	33
DOMINANCE	0	0	3	17
Total	18	100	18	100

PANEL C: POLITICAL GROUP

Type	YOU-OWN Freq.	YOU-OWN Percent	YOU-OTHER Freq.	YOU-OTHER Percent
SELFISH	4	22	5	28
SOCIAL MAXIMIZER	6	33	3	17
FAIR	8	44	6	33
DOMINANCE	0	0	4	22
Total	18	100	18	100

Table 9c: Distribution of Types, by Condition and Match
DEMOCRAT-LEANING INDEPENDENTS

PANEL A: NON-GROUP

	YOU-OTHER	
Type	Freq.	Percent
SELFISH	9	26
SOCIAL MAXIMIZER	11	32
FAIR	12	35
DOMINANCE	2	6
Total	34	100

PANEL B: MINIMAL GROUP

	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	11	32	9	26
SOCIAL MAXIMIZER	5	15	10	29
FAIR	16	47	13	38
DOMINANCE	2	6	2	6
Total	34	100	34	100

PANEL C: POLITICAL GROUP

	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	12	35	12	35
SOCIAL MAXIMIZER	5	15	1	3
FAIR	17	50	16	47
DOMINANCE	0	0	5	15
Total	34	100	34	100

Table 9d: Distribution of Types, by Condition and Match
REPUBLICAN-LEANING INDEPENDENTS

PANEL A: NON-GROUP		
	YOU-OTHER	
Type	Freq.	Percent
SELFISH	8	38
SOCIAL MAXIMIZER	4	19
FAIR	9	43
DOMINANCE	0	0
Total	21	100

PANEL B: MINIMAL GROUP				
	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	6	29	7	33
SOCIAL MAXIMIZER	3	14	2	10
FAIR	12	57	8	38
DOMINANCE	0	0	4	19
Total	21	100	21	100

PANEL C: POLITICAL GROUP				
	YOU-OWN		YOU-OTHER	
Type	Freq.	Percent	Freq.	Percent
SELFISH	8	38	7	33
SOCIAL MAXIMIZER	1	5	3	14
FAIR	12	57	6	29
DOMINANCE	0	0	5	24
Total	21	100	21	100

Table10a: X-Squared Test of Differences in Distribution of Types, between conditions/match
DEMOCRATS

Comparison	Test Statistic	** P-Val < 0.05 * P-Val < 0.10
NG/AS: You-Other vs.:		
MG: You-Own	5.05	
MG: You-Other	7.72	*
POL:You-Own	17.96	**
POL:You-Other	16.45	**
MG: You-Own vs.:		
MG: You-Other	6.37	*
POL: You-Own vs.:		
POL: You-Other	20.07	**
MG: You-Own vs.:		
POL: You-Own	2.79	
MG: You-Other vs.:		
POL: You-Other	2.42	

Table 10b: X-Squared Test of Differences in Distribution of Types, between conditions/match
REPUBLICANS

Comparison	Test Statistic	** P-Val < 0.05 * P-Val < 0.10
NG/AS: You-Other vs.:		
MG: You-Own	6.56	*
MG: You-Other	7.86	**
POL:You-Own	12.64	**
POL:You-Other	8.36	*
MG: You-Own vs.:		
MG: You-Other	7.86	**
POL: You-Own vs.:		
POL: You-Other	5.4	
MG: You-Own vs.:		
POL: You-Own	3.38	
MG: You-Other vs.:		
POL: You-Other	0.23	

Table 10c: X-Squared Test of Differences in Distribution of Types, between conditions/match
DEMOCRATIC-LEANING INDEPENDENTS

Comparison	Test Statistic	** P-Val < 0.05 * P-Val < 0.10
NG/AS: You-Other vs.:		
MG: You-Own	0.66	
MG: You-Other	0.88	
POL:You-Own	6.31	*
POL:You-Other	10.62	**
MG: You-Own vs.:		
MG: You-Other	2.18	
POL: You-Own vs.:		
POL: You-Other	7.70	*
MG: You-Own vs.:		
POL: You-Own	2.07	
MG: You-Other vs.:		
POL: You-Other	9.39	**

Table 10d: X-Squared Test of Differences in Distribution of Types, between conditions/match
REPUBLICAN-LEANING INDEPENDENTS

Comparison	Test Statistic	** P-Val < 0.05 * P-Val < 0.10
NG/AS: You-Other vs.:		
MG: You-Own	1.94	
MG: You-Other	4.79	
POL:You-Own	0.92	
POL:You-Other	5.81	
MG: You-Own vs.:		
MG: You-Other	5.08	
POL: You-Own vs.:		
POL: You-Other	8.07	**
MG: You-Own vs.:		
POL: You-Own	1.29	
MG: You-Other vs.:		
POL: You-Other	0.60	

References

Akerlof, George and Rachel Kranton. 2000. "Economics and Identity," *The Quarterly Journal of Economics* CVX (3), August 2000, pp. 715-753.

Akerlof, George and Rachel Kranton. 2010. *Identity Economics*, Princeton: Princeton University Press: 2010.

Alesina, Alberto and Reza Baqir and William Easterly. 1999. "Public Goods and Ethnic Divisions," *The Quarterly Journal of Economics*, Vol. 114, No. 4 (Nov., 1999), pp. 1243-1284.

Alesina, Alberto and Eliana La Ferrara. 2005. "Ethnic Diversity and Economic Performance," *Journal of Economic Literature Vol. XLIII (September 2005), pp. 762–800*.

Andersen, Steffen, Glenn W Harrison, Morten Lau and Elisabet Rutström. 2011. "Discounting Behavior: A Reconsideration," working paper.

Andreoni, James and John Miller. 2002. "Giving according to GARP: An Experimental Test of the Consistence of Preferences for Altruism," *Econometrica* 70(2), March 2002, pp. 737-753.

Andreoni, James, William Harbaugh and Lise Vesterlund. 2003. "The Carrot or the Stick: Rewards, Punishments, and Cooperation," *American Economic Review* 93(3), June 2003, pp. 893-902.

Bernhard, Helen, Ernst Fehr, and Urs Fischbacher. 2006. "Group Affiliation and Altruistic Norm Enforcement." *American Economic Review*, 96(2), pp. 217-21.

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

Bosch-Domènech, Antoni, José García-Montalvo, Rosemarie Nagel and Albert Satorra. 2010. "A Finite Mixture Analysis of Beauty-Contest Data Using Generalized Beta Distributions, *Experimental Economics*, December 13(4), pp. 461-475..

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

Chen, Yan and Sherry Li. "Group Identity and Social Preferences," *American Economic Review* 99(1), March 1999, pp. 431-457.

Conte, Anna & Hey, John D. & Moffatt, Peter G., 2011. "Mixture models of choice under risk," *Journal of Econometrics*, 162(1), May, pp. 79-88.

Easterly, William and Ross Levine. 1997. "Africa's Growth Tragedy: Policies and Ethnic Divisions," *The Quarterly Journal of Economics* (1997) 112 (4): 1203-1250.

Esteban, Joan, Laura Mayoral, and Debraj Rey. 2012. "Ethnicity and Conflict: An Empirical Investigation," *American Economic Review*, 102, pp. 1310-1342.

Fearon, James, David Laitin. 1996. "Explaining interethnic cooperation," *American Political Science Review* 90 (December), pp. 715-35.

Fehr, Ernst and Simon Gächter. 2000. "Fairness and Retaliation: The Economics of Reciprocity," *Journal of Economic Perspectives*, 2000 (14); 159-181.

Fehr, Ernst, Karla Hoff, and Mayuresh Kshetramade. 2008. "Spite and Development," *American Economic Review: Papers & Proceedings* 98(2), 494-499.

Fershtman, Chaim & Uri Gneezy. 2000. "Discrimination in a Segmented Society: An Experimental Approach," *Quarterly Journal of Economics*, 116(1), February 2000, pp. 351-377.

Gintis, Herbert, Samuel Bowles, Robert Boyle, and Ernst Fehr. 2006. *Moral Sentiments and Material Interests: Foundations of Cooperation in Economic Life*. Cambridge MA: MIT Press, 2006.

Glaeser, Edward and David Laibson, Jose Scheinkman, Christine Souter. 2000. "Measuring Trust," *Quarterly Journal of Economics*, 115(3), pp. 811-846.

Goette, Lorenz, David Huffman, and Stephan Meier. 2006. "The Impact of Group Membership on Cooperation and Norm Enforcement: Evidence Using Random Assignment to Real Social Groups." *American Economic Review*, 96(2), pp. 212-16.

Hardin, Russell. 1997. *One For All: The Logic of Group Conflict*. Princeton: Princeton University Press.

Harrison, Glenn and Elizabet Rutström. 2009 "Expected Utility *And* Prospect Theory: One Wedding and Decent Funeral," *Experimental Economics* 12(2), June 2009, pp. 133-158.

Haslam, S. Alexander. 2001. *Psychology in Organizations*, London: Sage Publications.

Iriberri, Nagore and Pedro Rey-Biel. 2010. "Elicited Beliefs and Social Information in Modified Dictator Games," working paper.

Klor, Esteban and Moses Shayo. 2010. "Social Identity and Preferences over Redistribution," *Journal of Public Economics* 94(3-4), pp. 269-278.

Miguel, Edward and Mary Kay Gugerty. 2005. "Ethnic diversity, social sanctions, and public goods in Kenya," *Journal of Public Economics* 89(11-12), December 2005, pp. 2325-2368.

Milgram, Stanley. 1974. Obedience to Authority: An Experimental Look. London: Tavistock Publications.

Nagin, Daniel. 2005. *Group-Based Modeling of Development*. Cambridge: Harvard University Press.

Reicher, Stephen and S. Alexander Haslam. 2011. "After shock? Towards a social identity explanation of Milgram's 'obedience' studies," *British Journal of Social Psychology*, 50, pp. 163-169.

Smith, Eliot R. and Diane M. Mackie. 2000. *Social Psychology*. Philadelphia: Taylor & Francis, 2000.

Stahl, D. O. 1996. “Boundedly Rational Rule Learning in a Guessing Game,” *Games and Economic Behavior* 16, pp. 303-330.

Stahl, Dale and Paul Wilson. 1996. “On Players’ Models of Other Players: Theory and Experimental Evidence,” *Games and Economic Behavior* 10, pp. 218-254.

Tajfel, Henri and John Turner, “An Integrative Theory of Intergroup Conflict,” in Stephen Worchel and William Austin, eds., *The Social Psychology of Intergroup Relations*, Monterey, CA: Brooks/Cole, 1979.

Turner, John, “Social Categorization and Social Discrimination in the Minimal Group Paradigm,” in Henri Tajfel, ed., *Differentiation between Social Groups*, London: Academic Press, 1978.

Appendix

Below is the instruction sheet presented to each participant.

PAGE 1

WELCOME!

INSTRUCTIONS

Thank you for participating in this experiment. The object of this investigation is to study how people make decisions. There is no deception in this experiment – and we want you to understand everything about the procedures. If you have any questions at any time, please ask the experiment organizer in the room.

PART I: THE CHOICE TASK

A) During the experiment, you will be presented with a series of choices. For each choice, you will be asked to award points to between either (1) yourself and another participant or (2) two other participants. You will earn the points you allocate to yourself, and the other person will earn the points you allocate to him or her. At the end of the experiment, one of your choices will be selected at random by a computer and the points earned will be converted into payments.

Each decision is independent from the others. Your decisions and outcomes in one choice will not affect your outcomes in any other choice. For each choice, you will be paired with new participants.

Use LEFT and RIGHT arrow keys to make your choices.

PART II and III:

A) INITIAL SURVEY
You will take a brief survey. There are no right or wrong answers. Your answers to these questions will not affect your payments. Please only use the RIGHT and LEFT arrow keys or NUMBER keys as instructed to answer all questions.

B) THE CHOICE TASK
After completing the initial survey, you will once again be presented with a series of choices. You will be anonymously paired with two new participants. These participants will remain the same throughout this part of the experiment. At the end of the experiment, one of your choices will be selected at random by a computer and the points earned will be converted into payments. Each decision is independent from the others. Your decisions and outcomes in one choice will not affect your outcomes in any other choice.

TURN PAGE OVER FOR ADDITIONAL INSTRUCTIONS

PAGE 2

PAYMENT

At the end of the experiment, the points you get will be converted into money by a predetermined conversion factor. This money will be added to your $6 participation payment and given to you at the end of the experiment. Since we want you to focus on completing the experiment and not calculating points to money conversions, we will not inform you of the conversion factor. However, we expect participants to earn between $12 and $18, with an average of $15.

SETUP

You will make all choices on a computer screen. You will make approximately 200 choices.

For each choice, you will see a screen that presents the two different points allocations you can make.

	YOU	OTHER
GREEN	10	10
BLUE	15	5

After a one second pause, two arrows will appear so you can pick which allocation you prefer. You can press either 'LEFT' or 'RIGHT' arrow keys on the keyboard to match the arrows presented on the screen. Please only touch the RIGHT or LEFT arrow keys for all choices.

	YOU	OTHER
GREEN	10	10
BLUE	15	5

←Green Blue→

Are there any questions? Press any key to begin.

These are examples of the aesthetic questions used for the Minimal Group Condition survey.

Question 4:

Which painting do you prefer?

Question 8:

Which line of poetry do you prefer?

You friendly boatmen and mechanics! You roughs!

You twain! And all processions moving along the streets!

This is an example of the questions used for the Political Treatment survey.

6. A smaller government would require cuts in spending on domestic programs like Social Security and Medicare.
Which would come closest to your views? I would:

1	**2**
FAVOR CUTS TO HAVE SMALLER GOVERNMENT	NOT FAVOR CUTS TO HAVE SMALLER GOVERNMENT

In the Minimal Group Condition, subjects allocated points to an Own Group Member and an Other Group Member. Taken from a bank of other participant's responses, the Own Group Member answered similarly on the highest number of questions as the subject while the Other Group Member answered most dissimilarly on survey questions. Overall, the Own Group Member answered 76.46% of questions similarly on average and the Other Group Member answered 31.91% of questions differently.

Characteristics of the participant in your OWN GROUP you will be paired with:

- Overall, this OWN GROUP MEMBER answered 83% of survey questions with the same response as you.

- This participant preferred the same painting as you on 6 out of 7 questions.

Characteristics of the participant in the OTHER GROUP you will be paired with:

- Overall, the OTHER GROUP MEMBER answered 29% of survey questions with the same response as you.

- This participant preferred the same poetry lines as you on 1 out of 7 questions.

In the Political Condition, subjects allocated points to an Own Group Member and an Other Group Member. Subject's Own Group Member identified with the same party and answered similarly on at least one out of the five political questions. Likewise, the subject's Other Group Member identified with the opposite party and answered dissimilarly on at least one out of the five political questions. Once an Own and Other Group Member were identified, the subject saw information about their allocation partners. For the Own Group Members, subjects were presented with information about party affiliation and the question on which the subject and Own Group Member answered similarly. If the subject and Own Group Member answered several questions similarly, preference was given, in order, to showing the abortion, gay marriage, Arizona immigration law, Bush tax cut, and government size questions (see Appendix C.3). The same applies for the Other Group Member.

Characteristics of the participant in your OWN GROUP you will be paired with:

- This participant identifies with the DEMOCRATIC PARTY.

- This participant believes that gay marriage should be LEGALLY RECOGNIZED.

Characteristics of the participant in the OTHER GROUP you will be paired with:

- This participant identifies with the REPUBLICAN PARTY.

- This participant believes Bush tax cuts should be MADE PERMANENT.

Information about responses on the political survey.

Political Affiliation	Strength of Affiliation	Percent
Republican	Strong	0.00
	Moderate	13.28
	Independent with Republican leaning	10.16
Democratic	Strong	14.84
	Moderate	32.81
	Independent with Democratic leaning	13.28
Other	Republican leaning	5.47
	Democratic Leaning	10.16

Political Question	Response	Percent
Which comes closest to your views on abortion? Abortion should be:	Generally available	60.99
	Under stricter control	30.05
	Not be permitted	8.51
Which comes closest to your views on gay marriage? Gay marriage should be:	Legally recognized	65.25
	Only civil unions, not marriage	24.11
	Not recognized	10.64
An Arizona law requires individuals to produce immigration documents if questioned by the police. Which comes closest to your views on illegal immigration? The law:	Goes too far	51.77
	Is about right	43.26
	Does not go far enough	4.96
The Bush tax cuts for households earning over $250,000 a year were set to expire this year, increasing taxes for these people. Which comes closest to your views? The tax cuts should be:	Made permanent	26.95
	Allowed to expire	73.05
A smaller government would require cuts in spending on domestic programs like Social Security and Medicare. Which would come closest to your views? I would:	Favor cuts to have smaller government	29.08
	Not favor cuts to have smaller government	70.92

Allocation Matrices and Summary Statistics in Non-group Condition.

$\Pi_i > \Pi_j$					
Matrix Number	(Π_i, Π_j) (Π_i, Π_j)		Percent Chose Bottom*	Π_i / $(\Pi_i - \Pi_j)$	
14	140	100	7.09	-2	
	100	40			
12	140	100	7.91	-1.5	
	80	0			
16	140	100	9.22	-0.5	
	120	40			
19	140	140	14.18	-0.5	
	120	80			
15	140	100	14.18	-0.25	
	120	0			
18	140	140	12.06	-0.16	
	120	0			
1	100	100	24.82	0	
	100	20			
7	140	40	51.06	0.2	
	120	120			
9	140	40	50.00	0.2	
	120	120			
10	140	60	38.57	0.33	
	120	100			
11	140	80	38.30	0.33	
	120	120			
21	160	0	36.43	0.375	
	100	100			
5	120	80	28.57	0.5	
	100	100			
22	160	40	27.66	0.5	
	120	80			
25	200	0	26.62	0.5	
	100	100			
26	200	0	43.57	0.5	
	180	20			
8	140	40	24.82	0.6	
	80	80			
17	140	120	10.64	3	
	80	80			
13	140	100	7.09	NA	
	80	40			
$\Pi_i < \Pi_j$					
Matrix Number	(Π_i, Π_j) (Π_i, Π_j)		Percent Chose Bottom*	Π_i / $(\Pi_i - \Pi_j)$	
3	100	200	48.9	0	

	100	100			
4	100	200	40.43	0	
	100	140			
2	100	140	30.50	0	
	100	60			
6	140	0	52.14	0.125	
	120	140			
23	160	80	35.00	0.2	
	140	160			
20	140	140	10.07	0.33	
	120	180			
24	160	120	19.15	0.33	
	140	160			

* Non-group Condition You-Other