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## Endogenous Social Identity and Group Choice

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# Endogenous Social Identity and Group Choice\*

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## Abstract

This paper tests social identity theory with respect to individuals' self-identification behavior. We report results from a laboratory experiment in which subjects choose their group membership, which is interpreted as decision to identify with the respective group. Inducing a trade-off between monetary payoffs and different group identification choices we elicit the respective implicit valuations of identifying with different groups. The variation of these valuations is in line with the predictions from social identity theory: Subjects have a higher valuation for identifying with groups with a higher status and with groups to which they have a smaller social distance. Finally, we show that this behavior predicts individual out-group discrimination in allocation decisions, which has previously been shown to be associated with social identity. Overall our results provide strong support for the notion that individuals optimize behavior with respect to social identity.

**Keywords:** Social identity, experimental economics, endogenous group identification

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# 1 Introduction

Since the seminal work by Akerlof and Kranton (2000) economists have started to consider social identity - “a person’s sense of self” - as a key determinant of human behavior. Especially the experimental economics literature has established a series of results regarding the role of social identity in individual decision making.<sup>1</sup> While these studies highlight different behavioral consequences of social identity, they all address a similar question: How does an *exogenous* variation of social identity affect individual behavior? Whereas the behavioral consequences of social identity have thus been under intensive scrutiny, research on identity as an “important economic choice” (Akerlof and Kranton 2000), however, is all but restricted to theoretical treatments.<sup>2</sup> This gap in the literature seems surprising, given that the process of choosing and managing identity resembles an integral part of social identity theory. Evaluating whether social identity qualifies as a core principle of economic decision making therefore requires testing whether its predictions also hold with respect to the analysis of identity as a choice.

To fill this gap, this paper analyzes the self-identification behavior of individuals in a laboratory experiment. In particular, we test social identity theory in three ways: First, we check whether individuals are generally willing to forgo monetary payoffs in order to acquire respectively retain a specific identity. In other words, we test if individuals have a positive valuation for a particular social identity, implying a positive utility from choosing this specific identity. Second, we test whether the level of these monetary valuations depends on the characteristics of the respective social identities in a way social identity theory predicts. Thereby we test whether individuals incorporate the trade-offs between utility from monetary payoffs and different social identities, i.e. whether they show some sort of optimizing behavior with respect to self-identification. Third, we connect behavior in these self-identification decisions to behavior in situations that have previously been linked to social identity, i.e. in-group and out-group discrimination in allocation decisions. If social identity drives the behavior in our experiment, an individual’s behavior should be consistent with the notion of identity as a determinant of behavior across different domains of choice.

Empirically investigating the predictive power of social identity theory in an economic way requires to impose some structure on the way identity enters an individual’s utility function. To do so, we focus on two dimensions whose importance for social identity is

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<sup>1</sup>Chen and Chen (2011) show that a common social identity improves cooperation and coordination behavior within groups. Chen and Li (2009) and Goette et al. (2012) document that social identity induces “ingroup altruism” and “outgroup envy”. Benjamin et al. (2010) show that priming of specific identities leads to behavior more consistent with respective stereotypes.

<sup>2</sup>See for example Benabou and Tirole (2011), Fershtman and Gneezy (2011), Hett and Mechtel (2013) and Shayo (2009).

generally acknowledged within the social psychology literature: First, individuals prefer to identify with groups whose stereotype(s) are more similar to themselves (*social distance*). Second, individuals prefer to identify with groups whose average salient characteristics are superior to those of a comparison group (*social status*). Thus, social identity theory predicts that individuals should be willing to forgo higher monetary payoffs to identify with groups whose members are more similar to themselves and with groups with a higher social status.

The general structure of our experiment is as follows. In each session, we recruited subjects from and carried out the experiment in two different universities simultaneously. In a first stage individuals had to take a basic math-task. Groups were then formed with respect to two characteristics: All individuals within the same group were similar with respect to their affiliation (university A or B) and their performance in the previous math-task (above or below the median within their university). As a result, there were four different types of groups, namely “good” groups and “bad” groups in both universities. According to the two dimensions of social identity we consider in our setup, we interpret groups from the other university as groups to which an individual has a *higher social distance* and groups with better results in the mathematics task as groups with a *higher social status*. In the main part of the experiment, subjects then had to decide whether they want to leave the group they have been originally assigned to in order to join one of these other groups. However, switching group membership had additional consequences with respect to monetary payoffs. Participants were informed that in the subsequent round a monetary payment for each group will be randomly assigned. Before the actual realizations of these payments were revealed, subjects had to indicate whether they want to switch to a particular group conditional on the difference in these monetary payoffs between their original and the respective new group. This mechanism in the spirit of Becker et al. (1964) implicitly measures the relative valuation to identify with the original group compared to the respective alternative group in monetary units. We then test whether these valuations vary according to social identity theory, i.e. whether individuals are willing to forgo a higher monetary payoff to prevent joining groups to which they have a high social distance and groups that have a low social status. Importantly, the two-by-two structure of the groups assignment mechanism allows testing these predictions within subjects.

In the next step of the experiment, subjects take a series of allocation decisions where they can condition each decision on the group membership of the individual that is affected by the respective allocation choice. This part of the experiment allows to test consistency of behavior in the previously described self-identification decision with the already established results from the experimental literature on social identity: Given the well-documented result that social identity is associated with discrimination between in-groups and out-groups in

allocation decisions, we should observe that individuals with particularly high valuations in the self-identification decisions also tend to discriminate more in allocation decisions, if the underlying driver of behavior is in fact social identity.

Our main results can be summarized as follows. First, we find that generally there is a non-negative monetary amount individuals are willing to forgo in order to remain in their original group. Given that our design eliminates any other source of (especially monetary) motivation to remain within the own group, this first result can already be interpreted as support for the notion of the existence of some sort of utility of self-identification. Our second result adds further confidence to this interpretation: We find that individuals not only have a positive valuation for specific group memberships but also that these valuations systematically vary with respect to the characteristics of these groups. Subjects let forgo significantly higher amounts of money in order to avoid joining a low status group compared to a high status group and to avoid joining a group to which they have a high social distance compared to a group to which they have a low social distance. These are exactly the patterns social identity theory predicts. Regarding the within-subject consistency of behavior across domains, i.e. between self-identification and allocation decisions, we find that individuals who require a higher monetary difference in order to join a particular group are also more likely to discriminate with respect to this particular group when it comes to allocation decisions. Overall, our results strongly confirm the predictions from social identity theory with respect to self-identification decisions and add confidence to the notion of identity as an important determinant of individual behavior. The observed consistency of behavior across decision domains strongly supports the notion that social identity shapes the general structure of preferences.

The remainder of the paper is organized as follows. Section 2 discusses the related literature from both social psychology and behavioral economics. Section 3 describes the experimental design. Section 4 presents and discusses our results. Section 5, then, concludes.

## **2 Related Literature**

### **2.1 Social Identity Approach in Social Psychology**

The concept of social identity basically consists of two distinct theories that have evolved in order to explain different behavioral patterns related to social groups: Social Identity Theory (SIT) and Self-Categorization Theory (SCT). Their common starting point is that individual membership in social groups affects behavior.

Within the social identity literature, a social group thereby is defined as “a cognitive

entity being meaningful to subjects at a particular point in time” (Tajfel 1974). It is, therefore, not necessary to think of a “group” in terms of actual (social) interactions between a number of individuals, but rather as a cognitive concept.

In an early contribution, Tajfel (1972) defines social identity as “the individual’s knowledge that he belongs to certain social groups together with some emotional and value significance to him of this group membership”. Tajfel and Turner (1979) state that social identity “creates and defines the individual’s place in society”, thereby underscoring the significance of the approach for the understanding of individual actions in social psychology.

Social Identity Theory (SIT) emerged as an approach to explain individual behavior in the context of intergroup relationships. A number of experimental studies in social psychology point to the existence of ingroup-bias. Even in situations in which individuals have been assigned to “social” groups based on an arbitrary characteristic (such as the preference for paintings by two different painters), they treat ingroup members significantly different than outgroup members. Experiments reveal that participants often favor the ingroup over the outgroup even if this leads to costs for the ingroup in absolute terms (Tajfel et al. 1971). SIT argues that a key explanation for the existence of this ingroup bias is an individual’s motivation to derive self-esteem from their membership in social groups (Tajfel et al. 1971, Tajfel 1972). Tajfel and Turner follow Festinger’s (1954) theory of social comparison and suggest that individuals have a desire for a positive and secure self-concept. Given this claim, they conclude that individuals like to see their own social groups as good groups, particularly in comparison to other social groups. This has a number of implications for both an individual becoming and remaining a member of a particular social group. Tajfel (1974) assumes that “an individual will tend to remain a member of a group and seek membership of new groups if these groups have some contribution to make to the positive aspects of his social identity; i.e. to those aspects of it from which he derives some satisfaction”. In economic terms, individual utility can thus be assumed to be an increasing function of social group status. If a particular social group does not contribute to an individuals’ positive self-image, one possible reaction is to leave (Tajfel 1974).

Self-Categorization Theory (Turner 1982, 1985; Turner et al. 1987; Turner et al. 1994) considers the question of what makes individuals seeing themselves as members of certain social groups. Self-categorization is said to occur as a function of *fit* (Oakes 1987, Oakes et al. 1991). Hornsey (2008) argues that individuals may perceive a high level of *comparative fit* if the group distinction minimizes perceived intragroup differences and maximizes intergroup differences. SCT argues that individuals cognitively represent their social groups in terms of prototypes (see, e.g., Hornsey 2008). A group distinction is perceived to have a high level of *normative fit* whenever social behavior and group membership are in line with stereotypical

expectations. Self-categorization theorists claim that “group identity not only describes what it is to be a group member, but also prescribes what kinds of attributes, emotions and behaviors are appropriate in a given context” (Hornsey 2008). Turner et al. (1987) argue that identifying with a social group means that the group’s typical characteristics become norms or standards for one’s own behavior. Members of a social group are, then, perceived to be more or less representative for the respective group (in comparison to its prototype).<sup>3</sup>

One can summarize that both SIT and SCT play a significant role in explaining the importance of social identity for individual preferences, feelings, and actions. Whereas SIT focuses on intergroup relations, SCT is concerned with the more general question of how individuals become members of social groups and how these social groups then influence individual behavior.

## 2.2 Social Identity Approach in Economics

The concept of social identity has been introduced into the economic literature by the seminal contribution of Akerlof and Kranton (2000) and first applied in Akerlof and Kranton (2002, 2005). Their basic framework assumes agents’ preferences to be endogenous and interconnected due to their dependence on memberships in social groups. Within these groups, an individual’s benefit increases in a group’s status and decreases in their perceived social distance to the group’s stereotypical behavior and appearance. According to this, individual behavior and the consequential utility gained from it are to a large extent determined by individual choices about which social groups to identify with. Akerlof and Kranton argue that a large variety of economic phenomena and results might need to be re-examined with respect to their robustness to the incorporation of this social identity mechanism. Behavioral predictions as well as welfare implications and, therefore, policy recommendations might differ strongly.

Shayo (2009) is a recent theoretical contribution in that meaning. In his model, it is possible that individuals prefer less redistribution although they would have a higher disposable income if there was more redistribution. The main mechanism which drives this result is the trade-off between individual material welfare of a member of a particular social group and the group’s status, which again impacts its members’ individual utility: By dismissing a redistribution policy, individuals can increase the status of their national group (as it prospers economically following lower taxes) and in return derive utility from

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<sup>3</sup>A nice example is presented by Haslam (2004): “People differ in the extent to which they are perceived to be representative or prototypical of groups in the same way that a sparrow is generally more representative of the category “bird” than a penguin. In this way all category members share a certain degree of prototypicality, while at the same time the extent of their relative prototypicality varies.”.

identifying with it. His paper is the first to explicitly address a potential trade-off between monetary payoffs and identity utility.

The role that identity plays when trying to resist temptations is analyzed in Benabou and Tirole (2011). In their theoretical model, individuals might be uncertain about their true beliefs and values and therefore rely on their past decisions when they face choices. These past choices then define the individual self-image. In this approach, “identity investments” form the individual self-image and serve as a mechanism to prevent oneself from unfavorable future actions.

Besides this theoretical work, a number of experimental economists have tested the influence of social identity on individual decisions in the lab. Klor and Shayo (2010) provide experimental evidence for the trade-off presented in Shayo’s (2009) theoretical model. Chen and Li (2009) analyze the effects of group membership on social preferences using different experiments. After having induced different social groups, they find that participants’ charity is significantly greater towards ingroup members. Additionally, participants were less envious when matched with an ingroup member than when matched with an outgroup member. Differences in behavior depending on social group membership can also be found with regard to reciprocity. Chen and Li (2009) show that in their experiments individuals reward good behavior with a higher probability when being matched with ingroup members. Goette et al. (2006) conduct experiments with Swiss Army cadets and exploit the random assignment of cadets to platoons in an officer training program. Thus, they can draw on social groups which were not only established for experimental purposes, yet maintain full experimental control. The participants took part in a prisoner’s dilemma game with possible third party punishment. They find that cooperation in the prisoner’s dilemma was significantly more likely if the two players came from the same platoon. Group assignment also played a role regarding punishment behavior. The results show that the third players chose stronger punishment when defection affected a member of their own social group than when it affected an outgroup member.

Whereas in Chen and Li’s article group membership was determined immediately before the main experimental tasks and the allocation of participants to groups was random in Goette et al.’s paper, Benjamin et al. (2010) focus on existing social identities. They prime participants to make their various social identities salient. More specifically, they focus on the effects of ethnic, racial, and gender norms on time and risk preferences. After being primed on one particular category, participants had to take part in different standard experiments to measure time and risk preferences. With regard to ethnic norms, Benjamin et al. (2010) find that Asian-American subjects primed on their ethnic identity make more patient choices than the control group consisting of Asian-American subjects that have not been primed.



In another set of experiments, Benjamin et al. (2010) come to the conclusion that native blacks (with long-standing US roots) and whites become more patient when race is made salient, whereas priming does not affect immigrant blacks' decision making. Contrary to the effects of making ethnic or racial identity salient, they find that priming with gender does not affect participants' decisions. A number of further experimental studies, based on both (more or less) minimal group settings or priming on existing identities support the results that social identity influences individual actions.<sup>4</sup>

All presented experimental studies have in common that they rely on exogenously varied, i.e. pre-existing or induced, social identities. Hargreaves Heap and Zizzo (2009) are the first to analyze endogenous identity selection. Following three to six rounds of a trust game, subjects who were first randomly assigned to groups were given the opportunity to switch groups via a market mechanism. They measure the “additional psychological benefit of group membership” by the difference between the stated value (i.e. the price one was willing to pay to switch groups respectively the price a subject needed to be paid to accept a group change) and the actual material value of group membership. The latter is defined as the “common expectation” of material advantage of being a member of one group over the other and is proxied by either the gap in average earnings from the previous round or the actual gap between average group earnings that materialized in the following round. Under these assumptions, they find that nearly all of their subjects revealed a positive psychological value of group membership, which on average ranged from 14.6 to 22.4 percent of experimental earnings and persisted also in later rounds, i.e. with experienced subjects. While their results imply a significant valuation of identity, their design, however, does not allow to clearly disentangle “psychological benefits” from strategic considerations of group membership, because of the repeated pay-off relevant interaction following the market phase. Moreover, the authors themselves mention that their findings might be sizeably confounded by reference dependence effects as a result of the chosen elicitation procedure (Kahnemann et al. 1990).<sup>5</sup>

Charness et al. (2011) extend the experimental analysis of endogenous group choices by another important dimension. They point to the fact that identity is multi-dimensional with one particular individual having different social identities (being, for example, female, French, a physician) at the same time. Their experimental setup aims to explain the determinants of

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<sup>4</sup>See for example Drouvelis and Nosenzo (2012), Masella et al. (2012), Riener and Wiederhold (2011), and Tanaka et al. (2010).

<sup>5</sup>They argue that the “psychological value is revealed in the gap between people’s WTP to join a group and their WTA compensation to leave a group, and it is well known from the experimental literature that there is often a wedge between such WTP and WTA assessment” (Hargreaves Heap and Zizzo 2009, p. 319). While the observed valuation would then still manifest a psychological phenomenon, it would be due to the experimental procedures rather than identity.

which part of identity is more salient in specific situations. In their 2x2 design they include two dimensions of identity: first, sharing a common team identity induced by a group task on the prior stage, and, second, having different endowment levels in public goods games. The results show that sharing a common team identity increases contributions in the public goods games. However, when focusing on subsequent endogenous group choice, the positive effect of shared team identity on group composition vanishes when endowment levels differ. It turns out that participants having a high endowment level tend to link with each other yielding a crowding out of shared team identities. However, unambiguous interpretation of the different endowment levels as a dimension of identity is difficult. Furthermore, their experimental design does not allow to test cleanly the interaction of identity and material payoffs as it does not rule out strategic considerations and interdependencies of actions.

### **3 Experimental Design**

Our experiment employs a revealed-preference approach to elicit an individual's valuation of identification with a social group. Using these valuations, we are able to assess the importance of group status and social distance for group selection which were identified as key determinants of identity formation in the social psychology literature. In order to causally interpret the results, we carefully create an environment which while allowing for a trade-off between monetary and non-monetary incentives is also void of any strategic considerations and enables control over other confounding factors. Thus, the revealed preferences solely reflect the intrinsic valuation of identification with a certain group.

The experiment comprises five stages. The first stage consists of a real-effort task which is subsequently used for group-assignment. The second stage is a social interaction phase via online chat. The third stage is the group-selection, in which participants' valuation of group identification is elicited. The fourth stage is a set of two-person allocation games. In the fifth and final stage, subjects engage again in a social interaction phase using an online chat program. The timing of the experiment as well as the information provided at the beginning of each stage is depicted in Figure 1.

#### **3.1 Stage 1: Group Assignment**

Given our interest in the effects of social distance and social status, our experiment deviates from the basic assignment rule of the minimal-group paradigm. Rather than relying on pure randomization or decisions in some trivial task, subjects in our experiment are assigned to non-overlapping groups of four along two dimensions: firstly, according to one of their

existing characteristics and secondly according to their performance in a real-effort task.<sup>6</sup> Although we depart from the minimal-group paradigm, we still strive to keep the groups in our experiment as minimalist as possible to strip them off any additional context to obtain full control over differences in their observable characteristics. To that end, we not only keep interaction within groups anonymous and prohibit revelation of one’s personal identity at any time, but also assign subjects to groups randomly conditional on the other two categories.

*Figure 1 about here.*

To induce social distance between groups, we conducted the experiment simultaneously at two different labs at different universities. We thus exploit one of the participants’ natural categories for self-reference - the affiliation with a specific university - as an assignment rule.

Within universities, we added a second assignment rule based on the real-effort task used by Bartling et al. (2009) to generate status. Subjects were asked to solve as many three two-digit numbers as possible in 90 seconds. Based on their score of correctly solved math-problems, subjects were divided into two groups. Subjects whose score exceeded the median number of correctly solved math-problems of that session at their university were randomly assigned to one of the three blue groups, while those with an inferior score were assigned to one of the three red groups at their university. To emphasize the status-component of this assignment rule, subjects were shown a winner’s podium with the blue group on top and a message displaying that subjects assigned to the blue group belonged to the 12 best, while those in the red group ranked among the 12 worst within their university.

To channel the participants’ focus on the two different dimensions of categorization, the respective university logo was displayed on all screens on the top right, while a group box at top center of the screen reminded subjects of their assignment to either the blue or red group.<sup>7</sup> We provide some screenshots of the experiment in Appendix A. As an additional means to make one’s group identity more salient, the ensuing instructions were printed on colored paper matching the subject’s respective group assignment.

Only after completion of the real-effort task, subjects were informed about the group assignment and its rules so as to rule out any strategic considerations. Moreover, we did not incentivize the real-effort task to make sure that the subsequent group selection as our primary decision of interest would not be affected by different levels of prior earnings.

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<sup>6</sup>Given these 2 dimensions, we apply a 2x2 design. Hence, there are four different groups in the experiment. First, a group with existing characteristic (a) and a good performance in the real effort task. Second, a group with characteristics (a) and a poor performance in the real effort task. Third and fourth, there are two groups sharing the exogenous characteristic (b), but are divided according to their performance in the real effort task. Since 48 subjects participated in a session, each of the four different groups was represented thrice.

<sup>7</sup>We removed the logo and the group box on the group selection screen.

### 3.2 Stage 2: Group Formation

Following the group assignment, as has become standard in economic experiments using minimal-groups, we added a stage of group-interaction to enhance group identity. Subjects participated in a group-quiz and were encouraged to discuss the problem with their group members via a chat program. The task consisted of three quartets of pictures. For each of those three sets of four pictures, groups had to find an umbrella term. They were given 60 seconds per quartet to discuss the solution via the chat program, before each subject had to enter his or her answer individually.<sup>8</sup> Subjects were prohibited to discuss personal information during the chat phase and were informed that violation of this rule would result in expulsion from the experiment. Aside from this constraint, conversations were unrestricted.

We opted against monetary incentives for correct solutions for two reasons: firstly, as was the case in the math-task, we wanted to rule out any level effects. Secondly, and more importantly, we wanted to prevent that monetary payoffs relied on group performance and that way might create a sense of reciprocity or guilt towards a subject’s fellow group members respectively raised strategic considerations for subsequent play.<sup>9</sup> At the time of the group chats, subjects had no information about the subsequent stages.

### 3.3 Stage 3: Group Selection

After the completion of the group formation stage, subjects were given the option to “switch” to one of the other three groups for the remainder of the experiment. Using the strategy-method (Selten 1967) and an adaptation of the BDM-mechanism (Becker et al. 1964), this choice decision enables us to elicit each individual’s degree of identification with the different groups  $G_{i,j}$ ,  $i \in \{Frankfurt, Trier\}$ ,  $j \in \{Blue, Red\}$ .

Every group received a random payoff  $\pi_{i,j} \sim U(200, 800)$ . Before subjects were informed about the realizations of these draws, they had to state their reservation valuation of group identification  $V_k$ ,  $k \in \{(i, -j), (-i, j), (-i, -j)\}$ , i.e. the difference in points between their own group’s and each of the three other groups’ payoffs at which they would like to change to the respective other group for the remainder of the experiment.<sup>10</sup> The use of the strategy-method allows a comparison between the effects of status and social distance at the within-

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<sup>8</sup>While subjects were not bound by the prior group discussions, the chat-log reveals that almost all of them followed the solution previously agreed upon group consensus.

<sup>9</sup>Despite the lack of monetary incentives, we did not observe any shirking from the subjects. All participants actively engaged in all of their group’s problems and entered at least one line per quiz.

<sup>10</sup>Subjects were allowed to enter any integer value between -600 and +600. A value of -600 indicates that the subject would want to switch to the other group irrespective of the differences in payoffs, while a value of +600 means he or she does not want to switch at all. The value 0 equals pure payoff-orientation, i.e. a subject prefers whichever group had the higher draw. No participant in our experiment stated a negative  $V_k$ .

subjects level.

To implement the decisions, each group was then matched with three other groups: one from the same university but different color, and two from the other university such that every color-university combination was represented once. Out of these 16 subjects, one subject and one of her decisions was randomly selected. The respective subject would switch groups if the realized difference between payoffs of her group  $G_{i,j}$  and the other group  $G_k$  which was randomly selected for implementation exceeded her stated reservation valuation for this group, i.e.

$$\Delta\pi \equiv \pi_k - \pi_{i,j} > V_k.$$

Otherwise, the subject remained with her group.<sup>11</sup>

Before they stated their valuations, subjects were told that this stage would be followed by an individual decision task and a second sequence of group-quizzes which would be completely analogous to the second stage aside from potential changes in group composition conditional on their decisions in the current stage.

After answering a set of control questions, each participant then made his or her decision privately. They were informed that their private decision would not be communicated to any other participant, but that group members would later receive information if anybody left or entered one's group. Hence, any decision to forfeit material gain so as to stay with one's group serves merely as a self-signal and could not function as a means to enhance other's group identity.

Note, that the instructions were explicit about the two key features of our design: on the one hand, the random nature of the different group payoffs and their independence of previous experimental stages was emphasized which leaves no scope for feelings of guilt or reciprocity that could influence a subject's valuation. On the other hand, it was made clear that any further interaction within groups would have no payoff consequences, thus ruling out strategic considerations of any sort. Consequently, any revealed group valuation is purely "psychological"/intrinsic by design. Moreover, since we employ the strategy-method and let every individual state their reservation valuation for all three of the other groups, we can control for a potential endowment-effect in group membership by looking at within-subject variation.

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<sup>11</sup>We chose this randomization procedure to make the nature of the group choice decision as clear as possible: Given that not more than one individual within each four groups will eventually switch, subjects can be sure that the characteristics of the other groups do not change apart from their own entry. This procedure rules out the possibility of subjects deciding whether to switch groups conditional on their belief about the switching behavior of other subjects. The implementation procedure of the group selection was common knowledge.

### 3.4 Stage 4: Two-Person Allocation Games

In the fourth stage of the experiment, we trial the predictions from social identity theory regarding identification behavior. Given the rich and consistent evidence on the effects of social identity on social preferences in the literature, we asked subjects to make a series of decisions in two-person allocation games selected from Bartling et al. (2009) and Charness and Rabin (2002).<sup>12</sup> Unlike experiments in social psychology and previous economic experiments on the topic, we restrict our attention to games which affect the decision-maker's payoffs directly. Just as in the group selection stage, we use the strategy-method to elicit decisions for all possible outgroup-matches as well as an ingroup-match.

Every subject played every game in both roles for a total of 64 decisions. Subjects were not informed about the outcome of the group selection stage when they made their decisions in the two-person allocation games. At the end of the experiment, one game, one role, and one partner was randomly selected for payoffs.

### 3.5 Stage 5: Group Task

The fifth stage consists of the pre-announced second sequence of picture puzzles. The procedures were identical to stage 2 with the only difference that subjects played with their new groups barring that a group change had occurred in stage 3 whose results were announced prior to this second group task.

This final stage solves the mere purpose to raise the psychological costs of a group change and make the decision to choose a particular group actually meaningful. As such correct solutions to the picture puzzles are again not incentivized.

### 3.6 Post-experimental Questionnaire

The experiment concluded with a post-experimental questionnaire, which contained questions about the participants' demographics, risk attitudes, time preferences, experience and satisfaction with their current studies and university, and the Big Five Personality Traits measure by Dehne and Schupp (2007). Additionally, the six-item scale of organizational identification by Mael and Ashforth (1992) was included as another validation check of our behavioral measure of identification.

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<sup>12</sup>Beside the four dictator-games from Bartling et al. (2009), we selected the two-person response games Barc7, Barc5, Berk21, and Barc1 from Charness and Rabin (2002). Moreover, we included two more games of the same structure which give Player B the option of costly punishment. A list of all games is provided in Appendix A.2.

### 3.7 Procedural Details

We conducted four independent computerized sessions using z-Tree (Fischbacher, 2007). The sessions were run simultaneously at the Frankfurt Laboratory for Experimental Economics (FLEX) at Goethe University Frankfurt and the Trier Experimental Laboratory (TrEx) at the University of Trier in the last week of June and the first week of July 2013. In total, 192 subjects participated in our experiment who were exclusively recruited from the student body of the two universities. Participation was limited to one session per student. Sessions lasted from 75 to 90 minutes. Subjects were paid €1 per 100 points earned in the experiment. Including the show-up fee of €4 paid to every participant, subjects on average earned €13.03, with the minimum at €8 and the maximum at €18.70.

## 4 Results

In this section, we present the results of our experiment. We first analyze the average level of subjects' stated reservation valuation of group identification  $V_k$  across all three groups. We then turn to the within-subject differences of the reservation valuations to scrutinize the effect of social distance and status on these measures of identification. Table 2 provides summary statistics of all the levels and differences in reservation valuations that we analyze in this section. Finally, we analyze whether the previous results are still in line with social identity theory once one considers within-subject consistency of choices.

*Table 2 about here.*

### 4.1 Reservation value of identification

We start by analyzing the average level of subjects' stated reservation valuation of group identification  $\bar{V}_k = \frac{V_{i,-j} + V_{-i,j} + V_{-i,-j}}{3}$  to inspect the overall importance of group affiliation in the subjects' decision process. Figure 6 displays the distribution of  $\bar{V}_k$ .

**RESULT 1:** *Subjects are willing to forfeit a significant amount of their earnings to remain with their initial group. This is consistent with individuals trading-off monetary gains against identification with their own group.*

*Figure 6 about here.*

On average, subjects require a 182.22 point differential between their own group’s and the other groups’ payoffs to switch groups with a median level of 175 points. The average point gap equals 36.44 percent of a subject’s expected earnings of 500 points from that stage. This value is significantly different from zero at any convenient significance level (t-test:  $p < 0.00005$ ).

Only 15 participants are purely payoff-oriented and reveal no valuation of group membership, while more than two-thirds of the participants have an average value of  $\bar{V}_k > 100$ . 26 percent of the subjects even state values of  $\bar{V}_k$  larger than 250, i.e. 50 percent of the expected earnings from the group selection stage. We therefore feel safe to conclude that group affiliation held sizable value to the overwhelming majority of the participants in our experiment. Given the independence of the group payoffs from previous interaction and the imposed absence of strategic concerns for group choice, we interpret our first result as clear evidence for the existence of an intrinsic value of identification.

## 4.2 Group-differences in reservation values of identification

Next, we focus on the group specific reservation values in order to analyze the effects of social distance and status. Figure 7 depicts the average values for each of the three groups and Figure 8 displays the distributions of the reservation values.

**RESULT 2:** *Reservation values differ significantly depending on the characteristics of the respective group they refer to.*

*Figures 7 and 8 about here.*

The necessary average point differential amounts to 186.1 points for the group of the same university but different color,  $G_{i,-j}$ , i.e. subjects who performed other than oneself in the math-task. The lowest average point differential is required for the group from the other university with the same color,  $G_{-i,j}$ , at 159.3 points, while the average is 201.2 points for the group from the other university with a different color,  $G_{-i,-j}$ . All these intergroup-differences are significant at the 1-percent level using a two-sided dependent t-test for paired samples. A Wilcoxon signed-rank test lends further support for this result, showing significant differences in the distribution of the reservation values for the different groups, also all at the 1-percent level of significance.



### 4.2.1 Social Distance

To further analyze the effect of social distance, we now take a closer look at the difference in reservation values between groups of the same color, i.e.

$$V^{SocDis} \equiv V_{i,-j} - V_{-i,-j}.$$

We did not include the difference between one's own group  $G_{i,j}$  and the same-colored group of the other university  $G_{-i,j}$  in our analysis of social distance, because in addition to the difference in social distance induced by university affiliation, group  $G_{-i,j}$  is also distinguished from  $G_{i,j}$  by the lack of common interaction in the group solving task of stage 2. We plot the distribution of  $V^{SocDis}$  in Figure 9 and the average reservation values of the two groups in Figure 10.

*Figures 9 and 10 about here.*

On average, subjects require 15.13 points more to accept a change to the different-colored group of the other university  $G_{-i,-j}$  than to the different-colored group of the own university  $G_{i,-j}$ . This difference is statistically significant from zero at the 1-percent level (two-sided t-test:  $p < 0.005$ ). This yields our next result:

**RESULT 3:** *Reservation values are significantly higher for groups to which subjects have a higher social distance.*

### 4.2.2 Social Status

In order to assess the effect of status on the identification process, we analyze the difference in reservation values between the two groups from the other university, i.e.

$$V^{Status} \equiv V_{-i,j} - V_{-i,-j}.$$

For the same reason as before, we abstain from including the difference between one's own group  $G_{i,j}$  and the different-color group from the same university  $G_{i,-j}$ . Figure 11 plots the distribution of  $V^{Status}$  and Figure 12 the average reservation values of the two groups.

*Figures 11 and 12 about here.*

Subjects on average ask for 48 points less when asked whether they want to join a high

status group of the other university  $G_{-i,j}$  compared to the low status counterpart  $G_{-i,-j}$ . This difference is statistically significant from zero at the 0.1-percent level (two-sided t-test:  $p < 0.00005$ ).

**RESULT 4a:** *Reservation values are significantly higher for groups with a lower social status.*

Splitting up the aggregate data and analyzing  $V^{Status}$  for the two different colors reveals an interesting underlying pattern (see Figures 13 - 16). Whereas subjects in the blue-colored groups, i.e. the high performers in the math-task, need 90.1 points more to switch to one of the low-performing groups (two-sided t-test:  $p < .00005$ ), the low performers themselves do not distinguish between the high- and low-status group of the other university. While the stated reservation value for the low-status group is on average 6.3 points higher, this difference is not statistically different from zero (two-sided t-test:  $p > .53$ ). The difference in  $V^{Status}$  between members of the high-status and the low-status groups is, however, highly statistically significant (two-sided t-test of equal averages:  $p < 0.00005$ , two-sided Wilcoxon signed-rank test:  $p < 0.00005$ ). This is a result we had no actual hypothesis on prior to the experiment. However, it seems to fit well to a strand of social identity theory, that we did not explicitly consider so far, namely the possibility of re-evaluating social status in order to manage self-image. To explicitly test this behavior seems to be a promising avenue for further research.

**RESULT 4b:** *Differences in reservation values with respect to social status depend on the social status of the subject's original group.*

*Figures 13 - 16 about here.*

## C. Within-subjects analysis

Until now, our analysis relies on aggregated measures. In this section, we will now focus on the within-subject dimension. So far, we interpreted our results as a confirmation of social identity theory. If this interpretation is truly correct, individual behavior in these identification decisions should be able to predict behavior in other decisions that matter for social identity as well. Given that, we should observe a positive correlation between outgroup discrimination in the two-person allocation games and subjects' reservation values elicited in the group selection stage, as both reflect a stronger concern for social identity. A higher reservation value concerning a particular outgroup should then yield more discrimination

against this outgroup.

Our econometric approach is the following. For each subject, we know the reservation value regarding all three outgroups. Furthermore, we know her decision in the four two-person allocation games conditional on the second player’s group identity. If a subject chooses the “prosocial” allocation in the first game when being matched with an ingroup member, but the “not prosocial” allocation when matched with an outgroup member, we interpret this behavior as negative outgroup discrimination. For all three pairs of group comparisons (ingroup-outgroup  $i,-j$ , ingroup-outgroup  $-i,j$ , ingroup-outgroup  $-i,-j$ ), we create the dummy variable *negative discrimination* $_k$ . This dummy variable takes the value of 1 whenever the outgroup is treated worse than the ingroup and 0 otherwise. Subsequently, we run logit estimations for all four two-person allocation games and all three pairs of ingroup-outgroup matches. In these estimations, we first regress the negative discrimination dummy variable on each subject’s reservation value regarding the relevant outgroup. Second, we also include some sociodemographic control variables: The dummy variable *gender* $_m$  takes the value of 1 whenever participant  $m$  was female and 0 otherwise. *Age* $_m$  captures subject  $m$ ’s age and *undergrad* $_m$  is a dummy variable that takes the value of 1 whenever this participant does not yet hold a first university degree.

For the prosocial and costly prosocial games, the estimated coefficients of both models are presented in Table 3. We find significant positive effects of the reservation value on negative discrimination when being matched with a member of the two other-coloured groups. However, there is no significant reservation value effect when being matched with a member of the other university’s group with the same color. This pattern is consistent with the aggregated results presented so far. It reveals that subjects are more likely to discriminate against outgroup members when their reservation value was higher. The average marginal effects depicted in Table 3 (approximately) reveal that an increase of the reservation value by 100 points (= 1 €) yields an increase in the probability to negatively discriminate by 3 to 4 percentage points. Given that the share of actually discriminating subjects is not very large (17.2 percent with respect to the same university-different color outgroup and 23.4 percent with respect to the different university-different color outgroup), this amounts to an effect size of about 17 percent. Hence, the relative impact of the reservation value on negative discrimination is sizeable.

The estimation results are qualitatively quite similar for the envy game (Table 4). Here, the average marginal effects turn out to be a bit lower. However, the share of negative discrimination is also lower: 10.9% with respect to the same university-different color outgroup and 11.5% with respect to the different university-different color outgroup. In contrast, we do not find significant effects of the reservation value on negative discrimination in the costly

envy game. As described above, the share of discriminating participants is rather small in the game (below 10% for all three outgroups).

As the next step of our analysis and in order to bring the results based on the separate estimations together, we now estimate a pooled model incorporating all four allocation games. In these estimations, standard errors are clustered at the subjects level. As can be seen from Table 5, our findings remain stable in the sense that the insignificant coefficients from the costly envy game do not destroy the significance of the reservation value's coefficients. Including the sociodemographic control variables, there is a highly significant positive effect of the reservation value on negative discrimination with regard to matches with both different-colored outgroups.

**RESULT 5:** *Within-subjects behavior is consistent across subjects' reservation values elicited in the group selection stage and outgroup discrimination in the two-person allocation games. The higher the reservation value, the higher the probability of negative outgroup discrimination against the different-colored groups. This pattern is consistent with the results presented above. We therefore conclude that reservation values can be interpreted as a measure for group identification.*

## 5 Conclusion

This paper addresses an important gap in the experimental economics literature on social identity. While existing work considered the question of how exogenous variation of identity affects human behavior, we analyze how individuals actually choose which group to identify with and investigate whether this behavior confirms the predictions from social identity theory. Given that group identification as an actual choice is an integral part of the social identity paradigm, our analysis provides a significant test of the general applicability of the social identity approach in the analysis of economic decision making.

In our experimental setup subjects choose their group membership, which is interpreted as decision to identify with the respective group. By linking group membership choices to monetary payoffs, our design allows to elicit the valuation of identifying with different groups. Our first result shows that there is indeed a trade-off between monetary payoffs and identity utility. Subjects are willing to forgo a significant amount of money in order not to join specific groups. Systematically varying the characteristics of the respective groups, the differences in these valuations reveal individual preferences over identifying with different groups. As social identity theory predicts, individuals prefer membership in groups with a high social status and in groups to which they have a low social distance. To put social

identity theory to an even stronger test, we analyze whether individual behavior of subjects is consistent with respect to social identity theory even when considering behavior across different decisions. Here we find that behavior in the identification decisions has predictive power for behavior in allocation decisions that have been previously shown to be associated with identity.

Overall our results provide strong support for the notion of individuals optimizing behavior with respect to social identity and thus encourages the explicit consideration of social identity and endogenous group identification within future economic research.

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# Appendix

## A. Experimental Design

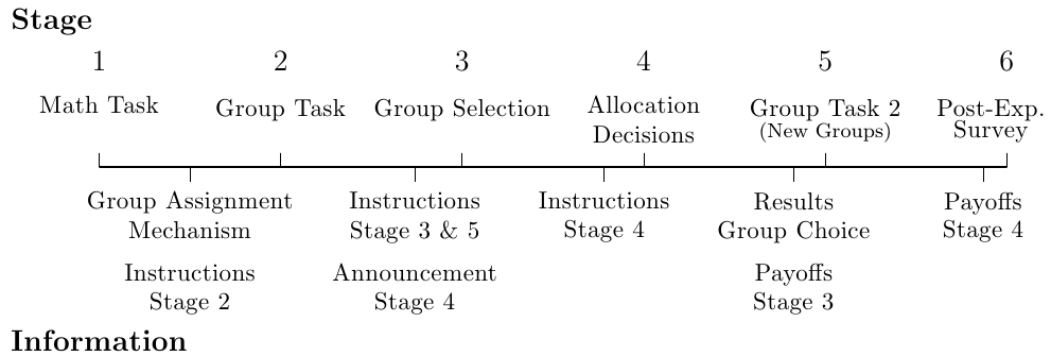


Figure 1: Experimental sequence and information

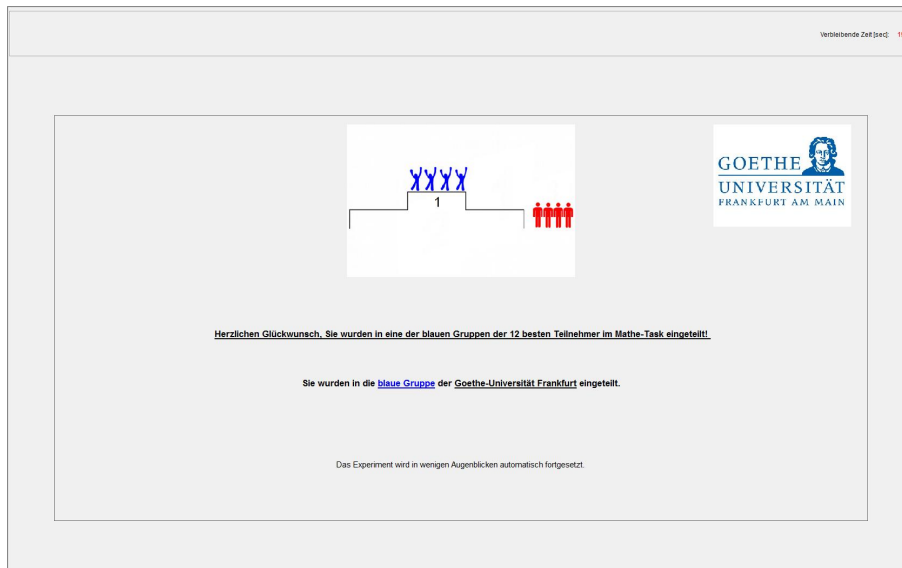


Figure 2: Group Assignment Screen

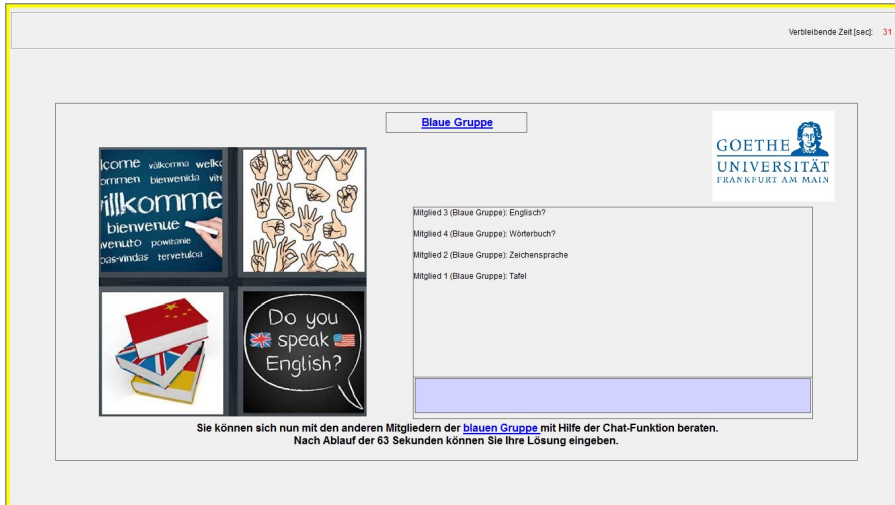


Figure 3: Group Problem Solving Screen

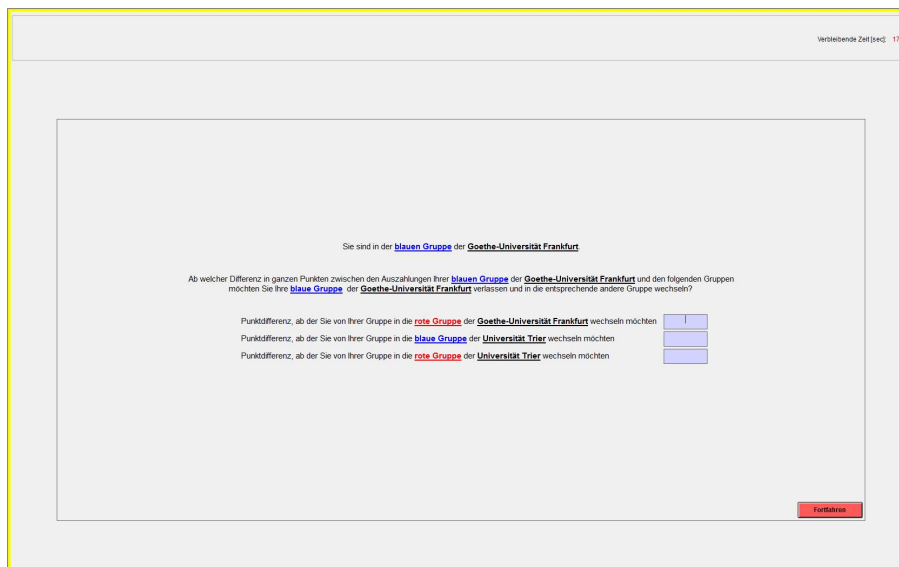


Figure 4: Group Assignment Screen

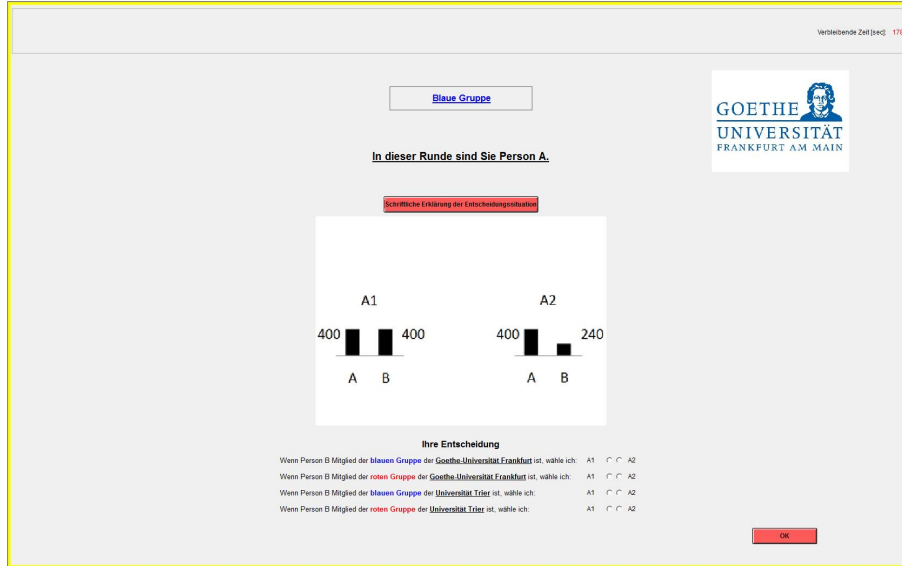


Figure 5: Sample Allocation Decision Screen

Table 1: Allocation Games

Game	A chooses	If A enters, B chooses
<i>Dictator games</i>		
Prosocial	(400, 400) vs.	(400, 240)
Costly Prosocial	(400, 400) vs.	(640, 160)
Envy	(400, 400) vs.	(400, 720)
Costly Envy	(400, 400) vs.	(440, 760)
<i>Response games: B can costlessly punish/help A</i>		
Resp 1a	(750, 0) vs. Enter	(400, 400) vs. (750, 400)
Resp 1b	(550, 550) vs. Enter	(400, 400) vs. (750, 400)
<i>Response games: B can costly help A</i>		
Resp 2a	(750, 0) vs. Enter	(400, 400) vs. (750, 375)
Resp 2b	(550, 550) vs. Enter	(400, 400) vs. (750, 375)
<i>Response games: B can costly punish A</i>		
Resp 3a	(750, 0) vs. Enter	(750, 400) vs. (400, 375)
Resp 3b	(550, 550) vs. Enter	(750, 400) vs. (400, 375)

# B. Experimental Results

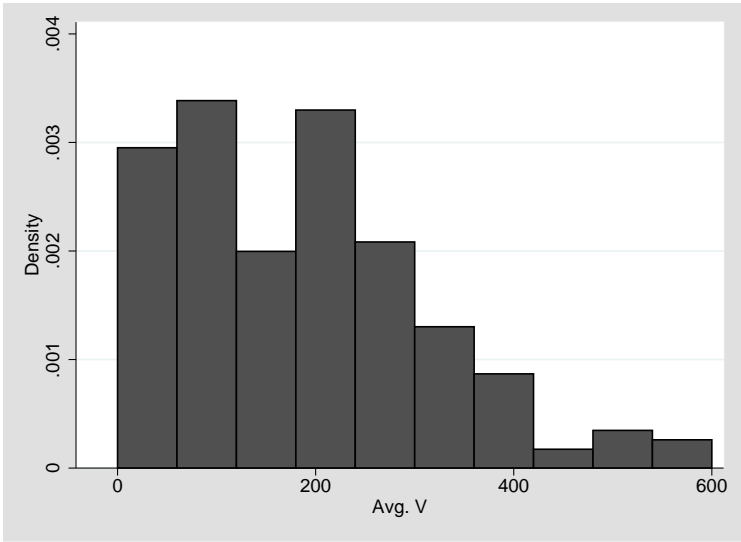


Figure 6: Distribution of the average reservation value

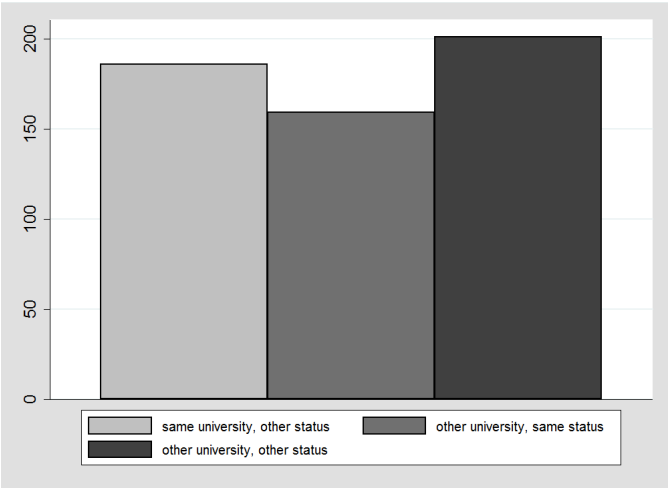


Figure 7: Average reservation value per group.

Table 2: Summary statistics: Reservation valuations

	Mean	Std. dev.	Median	25%-quantile	75%-quantile	Min	Max
$\bar{V}_k$	182.2***	128.8	175	86.7	263.3	0	600
$V_{i,-j}$	186.1***	141.3	200	100	280	0	600
$V_{-i,j}$	159.3***	133.8	150	50	200	0	600
$V_{-i,-j}$	201.3***	149.3	200	100	300	0	600
$\Delta : V_{i,-j} - V_{-i,j}$	26.8***	112.7	0	0	100	-380	350
$\Delta : V^{SocDis} = V_{i,-j} - V_{-i,-j}$	-15.1***	64.0	0	-12.5	0	-300	211
$\Delta : V^{Status} = V_{i,-j} - V_{-i,-j}$	-41.9***	119.1	0	-100	0	-600	400
$\Delta : V_{blue}^{Status} = V_{i,-j;blue} - V_{-i,-j;blue}$	-90.1***	118.57	-100	-150	0	-600	130
$\Delta : V_{red}^{Status} = V_{i,-j;red} - V_{-i,-j;red}$	6.2	98.9	0	-45	50	-200	400

Note: all means are tested against  $H_0 : \bar{V}_k = 0$ , using the two-sided dependent t-test for paired sample.

Differences are tested against  $H_0 : \Delta = 0$ , using the two-sided dependent t-test for paired sample.

\*\*\* sign. at 1%, \*\* sign. at 5%, \* sign. at 10%.

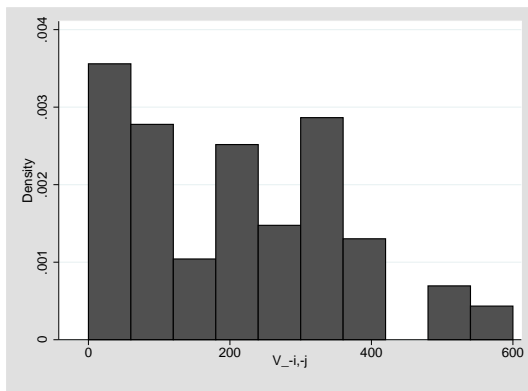
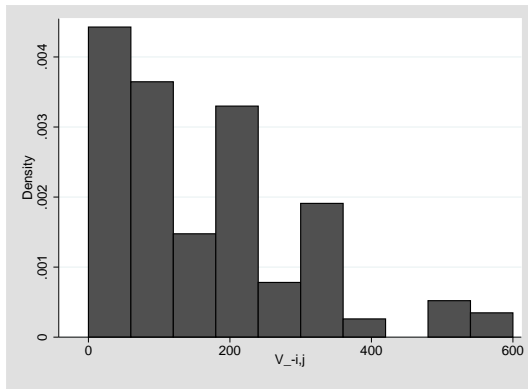
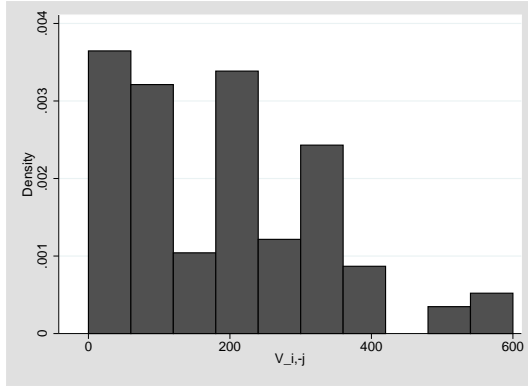


Figure 8: Distribution of the reservation values per group.

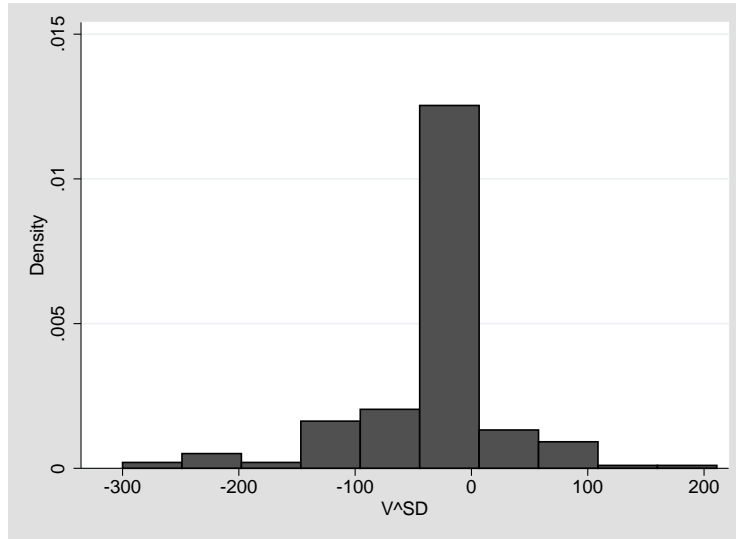


Figure 9: Distribution of  $V^{SocDis} \equiv V_{i,-j} - V_{-i,-j}$ .

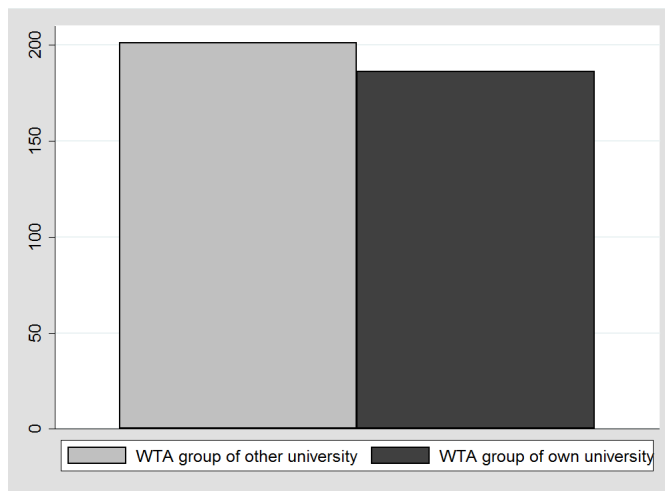


Figure 10: Average reservation values for groups of same status.



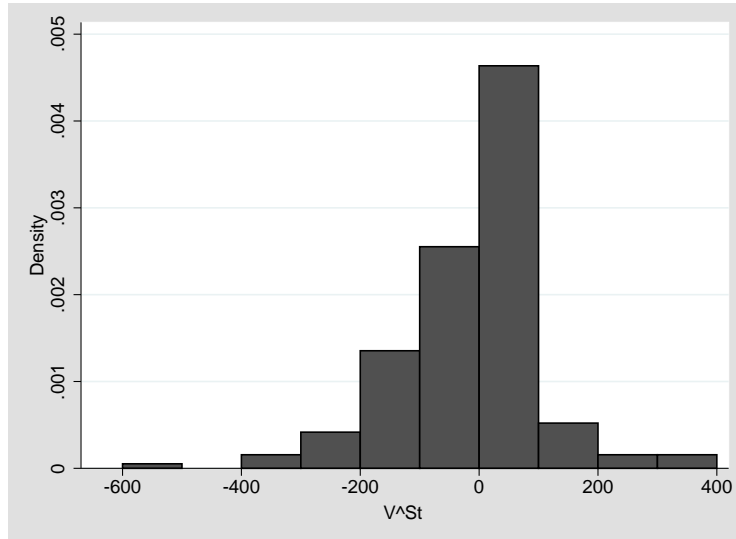


Figure 11: Distribution of  $V^{Status} \equiv V_{-i,j} - V_{-i,-j}$ .

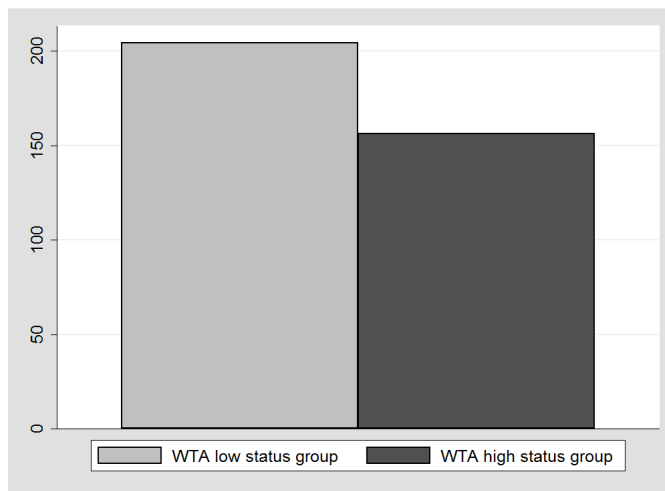


Figure 12: Average reservation values by status.

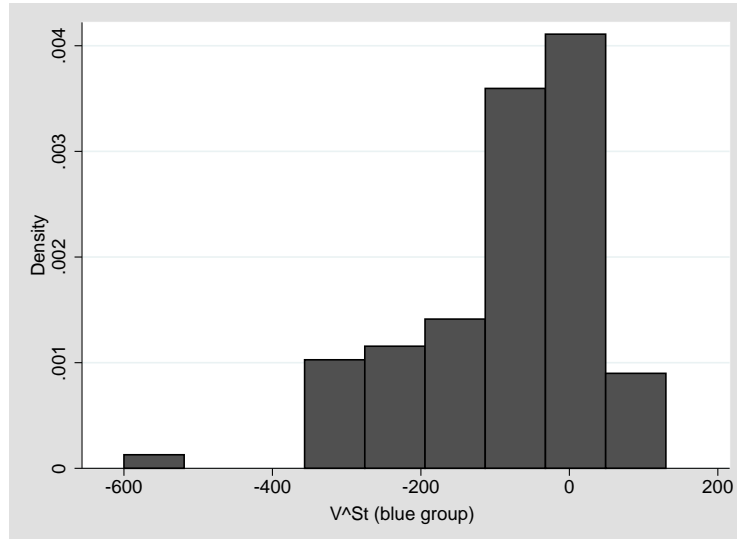


Figure 13: Distribution of  $V^{Status} \equiv V_{-i,j} - V_{-i,-j}$  for members of the blue group.

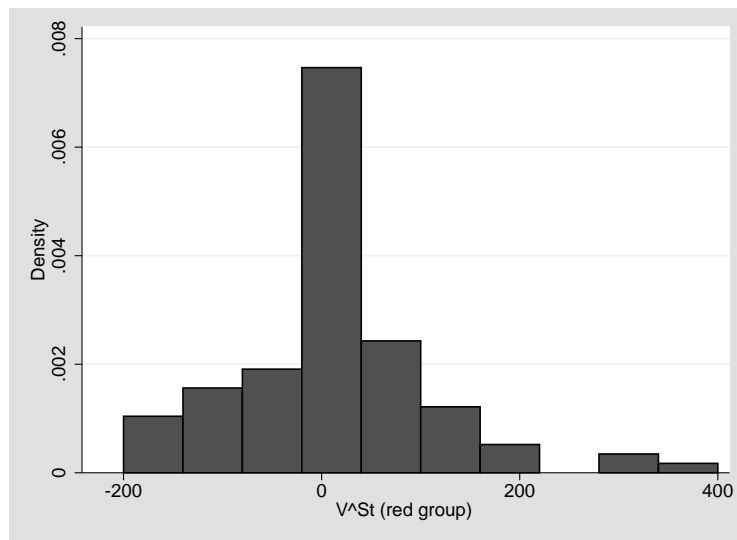


Figure 14: Distribution of  $V^{Status} \equiv V_{-i,j} - V_{-i,-j}$  for members of the red group.

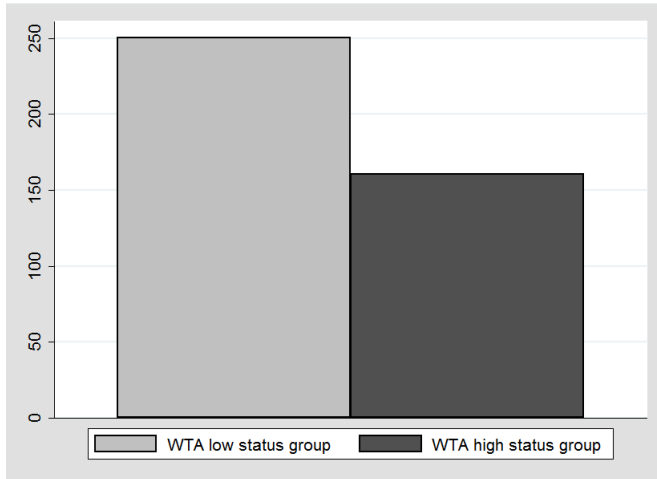


Figure 15: Average reservation values by status (blue group).

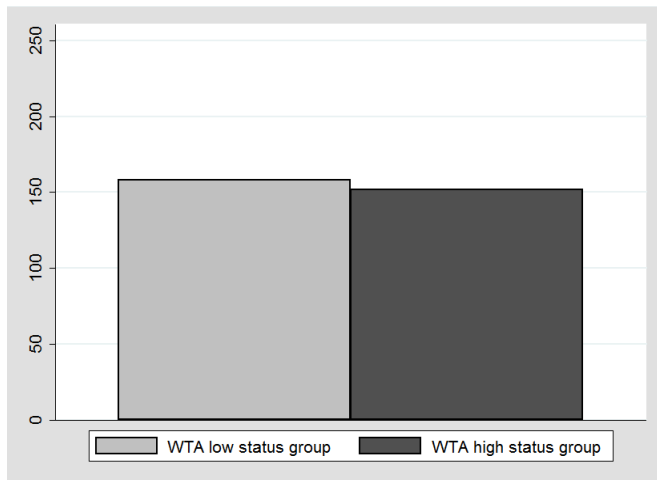


Figure 16: Average reservation values by status (red group).

	Same university different color		Different university same color		Different university different color	
<b>Prosociality game</b>						
$V_{i,-j}$	.0026** (.001)	.0029** (.0012)				
$V_{-i,j}$			.00009 (.0015)	.0003 (.0014)		
$V_{-i,-j}$					.002** (.001)	.0022** (.0011)
Gender		-.773** (.3939)		-1.4775*** (.4884)		-.5584 (.3458)
Age		.0459 (.042)		-.0675 (.0876)		.0252 (.0442)
Undergrad		-.1193 (.5491)		-.6078 (.5152)		-.0932 (.4708)
Constant	yes	yes	yes	yes	yes	yes
Average ME of $V$	.0004	.0004	.00001	.00004	.0004	.0004
Obs	192	192	192	192	192	192
Pseudo-R <sup>2</sup>	.02	.05	.00	.08	.02	.03
<b>Costly prosociality game</b>						
$V_{i,-j}$	.002* (.0012)	.0025* (.0013)				
$V_{-i,j}$			.0004 (.0012)	.0005 (.0012)		
$V_{-i,-j}$					.002** (.001)	.0023** (.0011)
Gender		-.7408* (.4001)		-1.1516*** (.4371)		-.6937* (.3729)
Age		-.1063 (.0695)		-.0071 (.0546)		-.0078 (.0399)
Undergrad		.2983 (.6224)		.3706 (.5769)		.4213 (.54)
Constant	yes	yes	yes	yes	yes	yes
Average ME of $V$	.0003	.0003	.00006	.00006	.0003	.0004
Obs	192	192	192	192	192	192
Pseudo-R <sup>2</sup>	.01	.05	.00	.05	.02	.04

Heteroskedasticity-robust Huber-White standard errors in brackets.

\*\*\* sign. at 1%, \*\* sign. at 5%, \* sign. at 10%.

Table 3: Logit estimation results. Coefficients and marginal effects for willingness to accept ( $V$ ). Dependent variable: Negative outgroup discrimination in prosociality games.

	Same university different color		Different university same color		Different university different color	
<b>Envy game</b>						
$V_{i,-j}$	.0024*	.0031**				
	(.0015)	(.0016)				
$V_{-i,j}$			.0012	.0015		
			(.0014)	(.0016)		
$V_{-i,-j}$					.0024*	.0026*
					(.0014)	(.0014)
Gender		-.6088		-.8146		-.2374
		(.4972)		(.534)		(.4661)
Age		-.2478**		-.244**		-.1632*
		(.1122)		(.1078)		(.0889)
Undergrad		-.239		.2078		-.0451
		(.7294)		(.7864)		(.6977)
Constant	yes	yes	yes	yes	yes	yes
Average ME of $V$	.0002	.0003	.0001	.0001	.0002	.0003
Obs	192	192	192	192	192	192
Pseudo-R <sup>2</sup>	.02	.08	.00	.08	.02	.05
<b>Costly envy game</b>						
$V_{i,-j}$	.0012	.0016				
	(.0016)	(.0017)				
$V_{-i,j}$			.0002	.0004		
			(.0018)	(.0019)		
$V_{-i,-j}$					.0007	.0011
					(.0015)	(.0015)
Gender		-.3926		-1.3357**		-.6273
		(.5663)		(.6759)		(.5377)
Age		-.2122		-.1282		-.1204
		(.1348)		(.1202)		(.106)
Undergrad		-.6228		.0805		-.2376
		(.7803)		(.8373)		(.7341)
Constant	yes	yes	yes	yes	yes	yes
Average ME of $V$	.0001	.0001	.00001	.00003	.00006	.0001
Obs	192	192	192	192	192	192
Pseudo-R <sup>2</sup>	.00	.05	.00	.06	.00	.03

Heteroskedasticity-robust Huber-White standard errors in brackets.

\*\*\* sign. at 1%, \*\* sign. at 5%, \* sign. at 10%.

Table 4: Logit estimation results. Coefficients and marginal effects for willingness to accept ( $V$ ). Dependent variable: Negative outgroup discrimination in envy games.

	Same university different color		Different university same color		Different university different color	
<b>Pooled (all four games)</b>						
$V_{i,-j}$	.0021*** (.0008)	.0025*** (.0008)				
$V_{-i,j}$			.0005 (.0009)	.0006 (.0009)		
$V_{-i,-j}$					.0018** (.0008)	.002*** (.0008)
Gender		-.6486** (.2818)		-1.1817*** (.3212)		-.526** (.254)
Age		-.061 (.0717)		-.0837 (.0569)		-.0226 (.0391)
Undergrad		-.0124 (.4586)		-.0221 (.4084)		.0859 (.3783)
Constant	yes	yes	yes	yes	yes	yes
Average ME of $V$	.0002	.0003	.0001	.0001	.0002	.0003
Obs	786	786	786	786	786	786
Pseudo-R <sup>2</sup>	.01	.03	.00	.05	.01	.02

Heteroskedasticity-robust Huber-White standard errors clustered at the individual level in brackets.

\*\*\* sign. at 1%, \*\* sign. at 5%, \* sign. at 10%.

Table 5: Logit estimation results. Coefficients and marginal effects for willingness to accept ( $V$ ). Dependent variable: Negative outgroup discrimination in all four games.