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Bernhard Kittel, Manuel Schwaninger, Réka Szendrö

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Need-based Justice beyond Close Social Ties: Experimental Evidence on the Scope of the Need Principle

Bernhard Kittel[a], Manuel Schwaninger[b], Réka Szendrö[a]

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Abstract

Close social relationships between individuals are deemed crucial for the prevalence of the need principle in a group. In this study, we examine whether the satisfaction of others' needs depends on the social relation between the group members in a controlled laboratory experiment. In the first stage, we induce feelings of social proximity among group members by means of a group task. In the second stage, participants are systematically matched into groups of three in which they bargain over the distribution of an exogenous endowment. The group composition varies with respect to the proximity of social ties. We hypothesize that group members who have collaborated in the first stage are more likely to form coalitions and, therefore, are more likely to satisfy each other's needs. The results suggest that the variation in social distance induced by the common task alone does not significantly affect variation in the satisfaction of needs. However, we find that large needs of outsiders are significantly less often satisfied than large needs of insiders.

Keywords

Need-based justice, scope of distributive justice, social distance, group identity

This study was pre-registered, AEA RCT Registry (https://www.socialscienceregistry.org/trials/4987).

[a] University of Vienna, Department of Economic Sociology, Kolingasse 14-16, 1090 Wien, Austria

[b] University of Oldenburg, Institute for Social Sciences, Ammerländer Heerstraße 114-118, 26129 Oldenburg, Germany

Corresponding author: bernhard.kittel@univie.ac.at

1. Introduction

Lasswell (1936) famously interpreted politics as the process of determining "who gets what, when, how". Theories of distributive justice emphasize the "what" and develop criteria that refer to different principles of justice (Konow 2003). According to the equity principle, each should get a share proportional to his or her contribution. The equality principle mandates that each gets the same, either in terms of identical opportunities or of identical outcomes. The need principle, in turn, orders, according to the view elaborated by Doyal and Gough (1991), that each should get enough to physically survive and realize personal autonomy. In this paper, we focus on who is meant by "each"? The answer to this question is rather unproblematic in the case of equity. All those who contribute should be entitled to a proportionate share. But the scope of "each" is left undefined in the case of equality and need.

From a cosmopolitan perspective, the scope of justice is mankind. "[T]he key idea is that every person has global stature as the ultimate unit of moral concern and is therefore entitled to equal respect and consideration no matter what her citizenship status or other affiliations happen to be. (…) The borders of states, and other boundaries considered to restrict the *scope* of justice, are irrelevant roadblocks in appreciating our responsibilities to all in the global community" (Brock 2009, p.3, p.9, emphasis original). On a global scale, both the "weak" and the "strong" versions of cosmopolitanism agree that resources should be allocated so that all individuals have the necessary means to live a "minimally decent life" (Brock 2009, 13), thus invoking the principle of need-based justice as a criterion. Similarly, based on the capabilities approach (Nussbaum 2011), reference budgets for minimum income standards (Deeming 2020) or the United Nation's Human Development Index capture various human capabilities that are thought to apply across all countries. These more 'humanitarian' notions of need-based justice suggest that the need principle is not restricted in scope.

This perspective is quite fundamentally at odds with accounts of justice that emphasize the differentiation between "spheres of justice" (Walzer 1983), determined by the interpersonal quality of a relationship (Liebig and Sauer 2016). Accordingly, the relative importance and salience of the different justice principles depends on the specific relationships underlying interpersonal interactions. Thus, within groups that have to distribute scarce resources, the need principle should be more prevalent the smaller the social distance between group members (Vekaria et al. 2017). Following this reasoning, we would expect that closer relationships between subjects in a group increase the likelihood that needs of others are satisfied.

In order to inform this debate empirically, we test these opposing hypotheses in an incentivized experiment. First, we raise social proximity between subjects in a laboratory by means of a computerized cooperation game, which is claimed to increase "people's liking of the task partner" (Dabbish 2008, p.355). After the cooperation game, subjects are matched into groups of three and are asked to negotiate via private chat channels with the other group members about the allocation of a scarce resource. Building on the experimental design developed by Kittel et al. (2020), we introduce needs by setting individual thresholds which have to be satisfied in order to participate in later stages of the game. Subjects negotiate allocations of the resource in a free-form format. We examine whether subjects who have played the cooperation game together in the first stage, the "insiders", are more likely to consider each other's needs in the allocations, compared to the needs of subjects with whom they do not share a common experience, the "outsiders". The results suggest that the variation in social distance induced by the common task alone does not significantly affect variation in the satisfaction of needs. However, we find that the effect of social distance depends on the size of the needs of outsiders. Large needs of outsiders are significantly less often satisfied than large needs of insiders.

The remainder of this paper is structured in the following way: First, we discuss our hypothesis based on the aforementioned literature.[1] In section 3, we describe the experimental design and we explain how we test our hypotheses empirically. Section 4 presents the results. Finally, we discuss the findings in section 5.

2. Social Distance and Need-based Justice

"The idea of common human needs entails the right even of strangers to optimal need-satisfaction" (Doyal and Gough 1991, p.103). However, according to pluralistic justice theories (Elster 1992, Walzer 1983) the sphere of society in which an interaction takes place has an influence of the relevance of different justice principles. Miller (2016) refers in his text to the importance of citizenship and identity, because that is what makes an individual "owe his fellow citizens the duty of maintaining justice between them" (Miller 2016, p27).

Based on the typology of human relations introduced by Fiske (1992), Liebig and Sauer (2016) differentiate between four types of social relationships and argue that these determine which

[1] The experimental design and the hypotheses have been pre-registered in The American Economic Association's registry for randomized controlled trials (November 12, 2019, and Registration Number: AEARCTR-0004987)

justice principle prevails in which type of relationships. Anonymous market exchange is the realm of equity, hierarchical relationships build on entitlement, networks and cooperatives refer to equality, and solidary communities rely on the need principle.

Given the subjectivity of concrete needs, it is difficult in anonymous situations to assess need claims beyond a general commitment to human dignity. From this perspective, the principle of need-based justice presupposes close relationships in which the veracity of need claims can be evaluated by those who are asked to recognize a claim as legitimate and to pay for the satisfaction of the need (Kittel 2020). Hence, while tight-knit communities can build on mutual knowledge and understanding of each other's needs, strangers are, by definition, not part of the solidary community (Walzer 1983). According to Vekaria et al. (2017) the prevalence of the need principle should decline with a rise in the social distance in a group. Hence, we expect that the higher is the overall social distance between group members, the less likely will the needs of all group members be satisfied (*Hypothesis 1*).

The likelihood to satisfy the needs of others also depends on the magnitude of others' needs. Konow (2003) argues that, while an outcome allocating resources according to needs is typically considered fair, the willingness to satisfy others' needs decreases with rising own sacrifices that are required to satisfy those others' needs. Even though people are not just motivated by self-interest, they become less willing to satisfy others' needs if allocations covering those needs have to be larger compared to their own share (Kittel, Neuhofer, and Schwaninger 2020). It is a stylized fact that people are more averse against disadvantageous inequality than inequality that benefits themselves (Fehr and Schmidt 1999). In order to satisfy larger needs of other people, decision makers have to sacrifice own benefits. Hence, we expect that the willingness to satisfy others' need will decrease with increasing inequality of need levels within a group (*Hypothesis 2*).

Tajfel et al. (1971) developed the concepts of in-group favoritism and out-group discrimination. People tend to develop feelings of group membership even in situations of minimal attachment such as being matched into random groups. Such minimal group identity fosters in-group favoritisms and discrimination of outsiders, which is often perceived as just by members of the in-group (Turner, Brown, and Tajfel 1979).

Since the need principle should be more prevalent in solidary communities (Liebig and Sauer 2016), especially in groups where the social distance between decision makers is small (Vekaria et al. 2017), we would expect that closer relationships between subjects in a group results in a

larger probability (a) that they form coalitions and, in consequence, (b) that they satisfy each other's needs, compared to those who do not have close relationships (*Hypothesis 3*).

However, according to Greenberg (1978) attitudinal similarities reduce the level of differentiation between in-group members and out-group members. Since all players exhibit their preferences in negotiations, we expect that social distance in initially diverse groups will decline over multiple negotiations and, in consequence, discrimination against outsiders will decline (*Hypothesis 4*).

3. Experimental Design

We conducted a laboratory experiment in which we varied the social distance between group members and the need thresholds of the participants. The experiment was fully computerized. We used z-Tree (Fischbacher 2007) to program the experiment and hroot (Bock, Baetge, and Nicklisch 2014) to recruit the participants. Subject earned money over the course of three stages.

Stage 1. In the first stage, we manipulate the relationships between group members through an incentivized, cooperative task played in groups of three. The group task follows the 'Wordfind game' (Dabbish 2008) and aims to increase people's liking of the group members. In the treatment groups, subjects are matched into teams and have to solve the tasks together. Within 10 minutes the teams have to find 15 words in a matrix of letters. They can communicate with the other group members using a common chat window. Additionally, they have to coordinate because two letters are hidden to each team member, while they are observable for the other two team members. If a team succeeds to solve the task, members get a reward of 4 points which are transformed into Euros at the end of the session. If they cannot solve the task within the given time constrain they earn 0 points. Subjects in the control group play a single-player version of the same task, which is identical except for the hidden letters.

To test the effect of the 'Wordfind game' on social distance, we conducted a manipulation test of the group task. Aron et al. (1992) constructed a measure called "Inclusion of Other in the Self" (IOS), which illustrates two overlapping circles, which describe the relationship between the self and the other. This measure is presented visually from 1 (illustrating no overlap between the two circles, representing the most distant relationship) to 7 (illustrating the closest relationship of the self and other). Based on the IOS measure, a similar measure, "Inclusion of the Ingroup in the Self" (IIS), was developed by Tropp and Wright (2001), describing how the

relation of the person to the group is perceived. Administering the IOS and IIS after the group task, the manipulation test shows that participants feel significantly closer to individuals who were previously part of the same group than to individuals who were part of a different group ($p = 0.01$). Likewise, individuals who are matched with new group members feel less close to the new group than individuals who stay in the same group ($p = 0.03$).

Stage 2. In stage 2, subjects are matched according to a between-subject treatment design into new groups and the treatments vary the number of group members who have been engaged in a common task in stage 1. In this stage, subjects are able to bargain with the two other players over the distribution of 24 payoff points organized by a triangle network. Subjects can send and receive private numerical offers within each of the three dyads of the three-player group. To make an offer, the sender proposes an allocation of the 24 points among the three group members. The format of the proposal is restricted to numbers, which are shown in private on the computer screen. The group members do not receive any information about the proposals made in other dyads. Subjects can make as many offers and counteroffers as they want. If an offer is accepted by the receiver, the period ends and the accepted offer is implemented in the group. If no agreement is reached within three minutes, all group members receive zero points.

The bargaining game is repeated over eight periods and while the structure of the network stays constant, we vary the need thresholds of the players in each period. In the control treatment (T0) groups in stage 2 consist of three players who played the Wordfind game in stage 1 individually and thus were unable to develop any group mindedness. In treatment 1 (T1), groups in stage 2 consist of three players who played the game in stage 1 in three different groups. In treatment 2 (T2), groups in stage 2 consist of three players of which two played in the same group in stage 1 (insiders) and one in a different group (outsider). In treatment 3 (T3), groups in stage 2 consist of three players who played the game in the same group in stage 1.

We implement need thresholds as a one-dimensional simplified concept of the multi-dimensional concept of capabilities (Kittel et al. 2020): To represent the concept of "survival in dignity" (Nussbaum 2011) in a laboratory setting, subjects have the capability to proceed to stage 3 only if their allocation equals or exceeds the individually assigned threshold. We limit and control for competition between subjects' need claims by setting the sum of thresholds lower than the total endowment and this value stays constant over all periods. A critic of this design might argue with Greenberg (1981) that needs become relatively unimportant in abundant situations because they are easily fulfilled. However, this is exactly the decision context that we want to create: If the satisfaction of others' needs were only feasible by

sacrificing own survival, no being with at least a small dose of self-regard would satisfy those needs. Nevertheless, this note of caution suggests that we can expect a large percentage of need satisfaction. Furthermore, note that there is no financial incentive to satisfy others' needs.

The sum of the assigned thresholds always adds up to 15 points. In each group we assign each participant either the *low*, *middle* or *high* (L-M-H) need threshold. Hence, we can rank the neediness of the group members. The relative position of neediness remains constant over the 8 periods, but in each period the range of thresholds varies randomly (see Table 1). This means that the subject with the high threshold always keeps the highest threshold during the experiment. We explain the meaning and consequences of the thresholds to the participants at the beginning of stage 2. The assigned thresholds of all network members are common knowledge in stage 2.

Table 1. Need threshold scenarios

Scenario:	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**
Low Threshold	5	4	3	2	1	0	0	0
Middle Threshold	5	5	5	5	5	5	3	1
High Threshold	5	6	7	8	9	10	12	14
Range of Thresholds	0	2	4	6	8	10	12	14

In T2, subjects can either be each other's former team members (insiders) or not (outsiders). We vary the different threshold roles of the outsider within T2, thus generating three sub-treatments: T2L where the outsider is assigned the lowest threshold, T2M for the outsider with the middle threshold and T2H for the outsider having the highest threshold.

Period 1 is independent of previous outcomes and, hence, allows an independent, statistically sound comparison between the treatments. Behavior in periods 2-8 can be affected by the varying threshold levels, learning, experience (effect of previous bargaining outcomes, e.g. reciprocity), and overarching strategic considerations (e.g., fairness). To minimize the influence of experience and meta strategies on the bargaining outcomes, we randomly select one period to be paid out after the experiment. To minimize the influence of learning on the bargaining outcomes we randomize the threshold distributions in periods 2-8, which in theory should entail the same average learning effects across the different periods.

Stage 3. In stage 3, the participants individually play a real-effort task, which consists of a mix of math puzzles, word finding games and trivia questions. We do neither provide information about the difficulty of the tasks nor about the average payoff from the tasks. In this stage, participants do not interact. However, in order to control for the expected payoff of oneself and

others, we asked participants to state their expectations about how much additional money they and their fellow group players will earn.

At the end of the experiment, the points earned in the experiment are converted in Euros and the laboratory assistants pay the participants separately and in private.

3.1. Procedure

In total, we conducted 18 sessions. The number of participants varied between 12 and 27 over the course of the sessions. We ran the experiments in the Research Laboratory of the WiSo Faculty at the University of Hamburg between December 2019 and February 2020, resulting a sample of 360 subjects.[2] The sessions lasted about 90 minutes and the participants earned on average EUR 20,78. All subjects were students registered at University of Hamburg, with the median participant being female 25 years old and in her 7th semester. At the end of the session, subjects completed a questionnaire including several socio-economic items, such as gender, age, country in they lived the longest, their major, the number of completed semesters and the number of experiments in which they have participated.

3.2. Operational hypotheses

The hypotheses elaborated in section 2 can be outlined in more concrete terms with respect to the expected differences in outcomes between the treatments.

Operational hypothesis 1: The need satisfaction rate within the group (NSR-G) of treatment 3 (all members from the same group) is higher than in the control treatment and in treatments 1 (all members from different groups) and 2 (insider-outsider setting, two members from one group, one member from a different group).

Operational hypothesis 2: The higher the inequality of need thresholds, the lower the NSR-G.

Operational hypothesis 3a: Within treatment 2, subjects who played together in stage 1 are more likely to form coalitions in stage 2 than subjects who did not.

Operational hypothesis 3b: Within treatment 2, subjects who played together in stage 1 are more likely to satisfy their need thresholds in stage 2 than the need thresholds of subjects who did not.

[2] Due to the outbreak of the Covid-19 pandemic, the laboratory was closed in the middle of the experiment. Up to the time of writing, we were unable to resume further sessions.

Operational hypothesis 4: The more periods the groups play in stage 2, the less impact has the social closeness induced in stage 1 on the need satisfaction rate.

Hypotheses 1, 2 and 4 refer to the overall social distance within the groups that is the largest in T0, wherein subjects played individually in stage 1 and should not have developed any group mindedness. In T1, subjects solved the tasks in groups, but are matched with strangers. Therefore, the aggregate social distance should be smaller than in T2, in which two subjects played in the group game together. The social distance should be smallest in T3, because subjects have played in the previous stage together.

Hypotheses 3a and 3b focus on the core of the research question underlying this paper: Do insiders treat outsiders different from insiders and what role accrues to the need thresholds?

4. Results

First, we compare the outcomes between the four main treatments and focus on the overall social distance between group members. We discuss the need satisfaction rate and payoff inequality. In addition, we discuss the need satisfaction rate in different threshold scenarios and across the eight consecutive periods. Then, we examine in more detail the outcomes in the sub-treatments of treatment 2 to test Hypotheses 3a and 3b. Further, we investigate which coalitions form in the three sub-treatments.

4.1. Overall social distance within the groups and bargaining outcomes

Figure 1a shows the variation of the NSR-G across the four treatments. Overall, the need thresholds of all group members (NSR-G) are satisfied in 74% of the cases. Mann-Whitney tests suggest that none of the four treatments differs from the others, neither in the first period nor in the remaining periods (each test, $p > 0.10$). Hence, the data rejects Hypothesis 1 that the need satisfaction rate is higher in T3 than in the other treatments.

Figure 1b shows the effect of the group composition on inequality, measured by the range of distributed payoffs in stage 2. The results show that the inequality is higher in T0 compared to T1 (one-sided Mann-Whitney test, $p = 0.03$), T2 ($p < 0.01$) and T3 ($p < 0.01$). Between T1, T2 and T3 the NSR-G is almost identical, yet the differences between T1 and T3 ($p > 0.10$) as well as T2 and T3 ($p > 0.10$) are lower and the observed direction of the relationship is in line with our initial expectations. This reveals that in contrast to the satisfaction of needs in stage 2, the payoffs are significantly more unevenly distributed if subjects have not experienced a common

group task and are more evenly distributed in if subjects have made that experience in the same group. Overall, subjects show a strong inclination to satisfy each other's needs in all treatments even though satisfying need thresholds of others reduces own payoffs.

Figure 1a. NSR-G across four main treatments

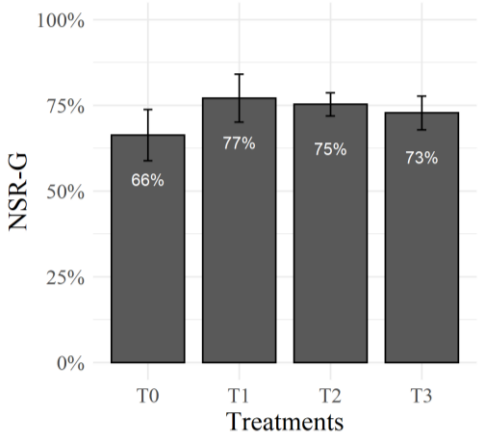
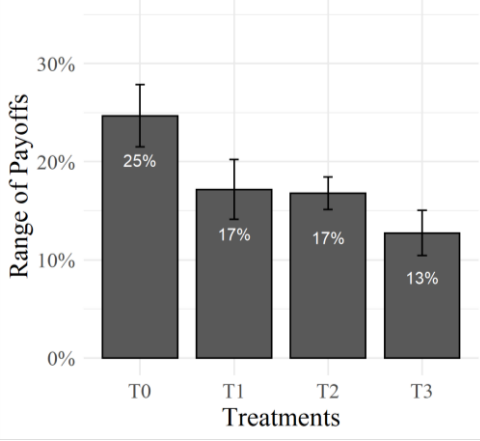


Figure 1b. Inequality across four main treatments



Mean and 95% confidence intervals of total NSR-G and range of payoffs

What drives the subjects to satisfy their group members' needs? The need thresholds have an extrinsic and an intrinsic value. Extrinsically, satisfying the need threshold is valuable, because the potential total payoff in stage 3 increases, thus maximizing group-level efficiency. Intrinsically, satisfying the need threshold of an individual may also generate a value because this subject is granted the opportunity to earn additional payoffs. To examine whether subjects consider the extrinsic value of stage 3, we included questions eliciting their payoff expectations from stage 3. More specifically, we asked the subjects how many points they expected themselves and their fellow group members to earn in stage 3. Subjects expected to earn 7.31 points in stage 3 and actually earned 3.67 points on average. Groups in which the members expected the extrinsic value of the need thresholds to be higher, were not more likely to satisfy the need thresholds (cor.= 0.11, $p = 0.23$). If subjects consider the extrinsic value of the need thresholds, they may also distribute payoffs in stage 2 to equalize payoffs as much as possible. However, we find no evidence that subjects accepted stronger inequality in stage 2 in favour of more equality after stage 3 (see Appendix, Figure A1). The difference between inequality in stage 2 and expected final payoff inequality is not statistically significant (two-sided Mann-Whitney test, $p > 0.10$). Therefore, it appears more likely that subjects satisfied the need thresholds because of the intrinsic value - to give everyone in the group the chance to earn the additional income.

One potential explanation for the finding that need satisfaction does not vary substantially between the group compositions is that the cooperation task at the beginning insufficiently

induced subjects to differentiate between insiders and outsiders. Social identity theory (Tajfel et al. 1979) suggests that, besides cooperation within the group, competition between groups can increase in-group favouritism. Therefore, we conducted additional manipulation tests, which tests the influence of a competitive group task in stage 1 on the need satisfaction rate. In the competitive group task, each group competed against all other groups and only the 50 percent fastest groups earned payoffs in stage 1. In the standard group task, each group that solved the task in time earns payoffs, but they did not compete against the other groups. The results suggest that the differences in social closeness among members of the in-group between the standard and the competitive treatment is statistically not significant (two-sided Mann-Whitney, $p > 0.10$). Likewise, the two treatments did not result in differences in the level of social distance to the out-group ($p > 0.10$) on average.

4.2. Need thresholds of the outsider and need satisfaction

We observe no significant differences regarding NSR-G across the four main treatments. However, differentiating T2 into its sub-treatments T2L, T2M and T2H and comparing these sub-treatments with the other treatments reveals three important and significant differences (Figure 2a and 2b). First, while the overall social distance within the groups has a small effect on the need satisfaction rate at best, the outsider's need in Treatment 2 appears to be crucial: When the outsider's threshold is low (T2L), groups are more likely (one-sided Mann-Whitney $p = 0.03$) to satisfy the needs of all group members than in T3, in which all players have collaborated in the group task of stage 1, although the overall social distance within the group is the smallest in T3. Second, when the outsider's needs are the largest, the need satisfaction rate is even smaller (one-sided Mann-Whitney test, $p = 0.06$) than in T1, where the social distance is the highest, apart from the control treatment. Third, the difference in the need satisfaction rate between T2L (low need threshold of the outsider) and T2H (high need threshold) is statistically significant (one-sided Mann-Whitney test $p < 0.01$).

Figure 2a. NSR-G across all six treatments

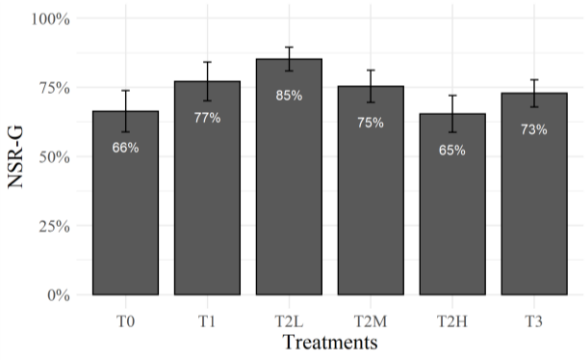
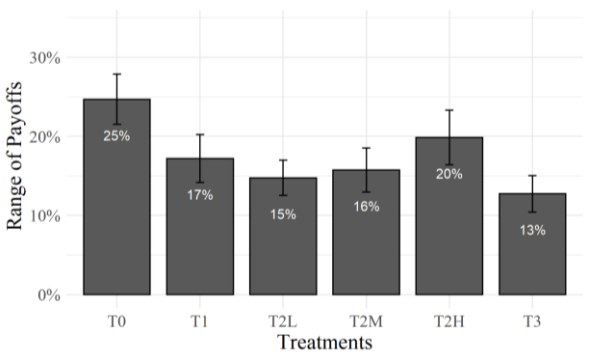


Figure 2b. Inequality across all six treatments



Mean and 95% confidence intervals of total NSR-G

Inequality across the three variants of T2 mirrors the results on need satisfaction. The range of payoffs is higher if the high threshold is assigned to the outsider than if it is assigned to either of the two insiders, although the difference is not sufficiently large to become statistically significant. However, the difference between T2H and T3, in which all three subjects have been in the same group in stage 1, is statistically significant (one-sided Mann-Whitney test, $p = 0.09$). Hence, we conclude that social proximity fostered by prior interaction is not sufficient to induce discriminatory behaviour against outsiders. Discrimination requires as an additional condition a high need level of the outsider. In this case, the need satisfaction rate of outsiders is significantly lower. Hence, the results support Hypothesis 3b partially.

In the following, we will examine the role of the outsider's need and its effect on distributive decisions in more detail and focus on the individual need satisfaction rate (henceforth NSR-I). If the variation of need thresholds between members is small (Figure 3a), the need satisfaction rate of outsiders does not vary significantly compared to insiders. If anything, low need-thresholds of outsiders are even more often satisfied than those of insiders, because they demand less compared to insiders with low need-thresholds. However, as the difference between need thresholds increases, the threshold is more likely to influence the NSR-I (Figure 3b), depending on whether players are insiders or outsiders. In consequence, the difference between the NSR-I of in- and outsiders becomes significant (Mann-Whitney test, $p < 0.01$). This result is driven by outsiders with high needs. When the outsider's need threshold is either low or medium, their NSR-I is statistically indifferent to the NSR-I of insiders. However, the difference between the NSR-I is significantly larger when the outsider has large needs, compared to insiders' large needs (Mann-Whitney test, $p < 0.01$). Hence, we conclude that although outsiders and their needs are considered in the distribution decisions, we can still observe a discrimination effect.

Figure 3. NSR-I depending on the role (outsider/insider) and the threshold of the player

Figure 3a. Needs of all players are below 9

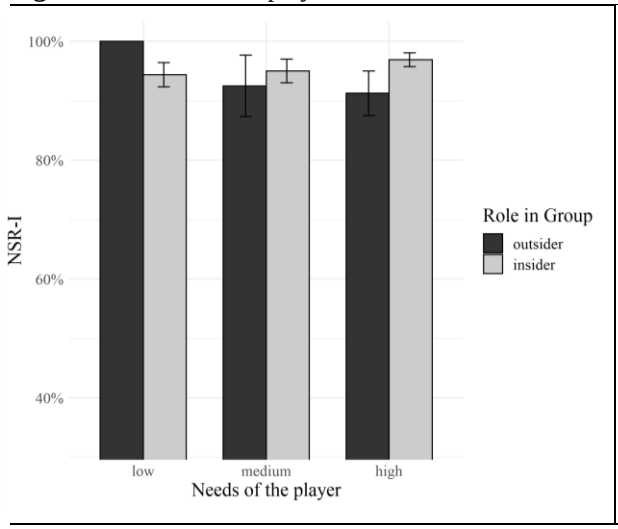
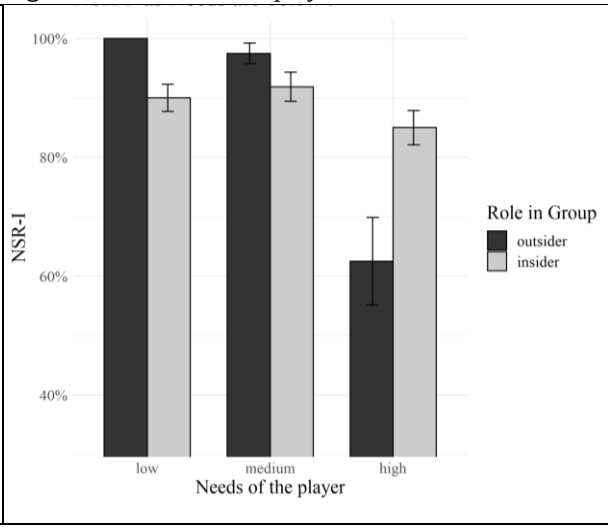


Figure 3b. Needs of one player is above 8

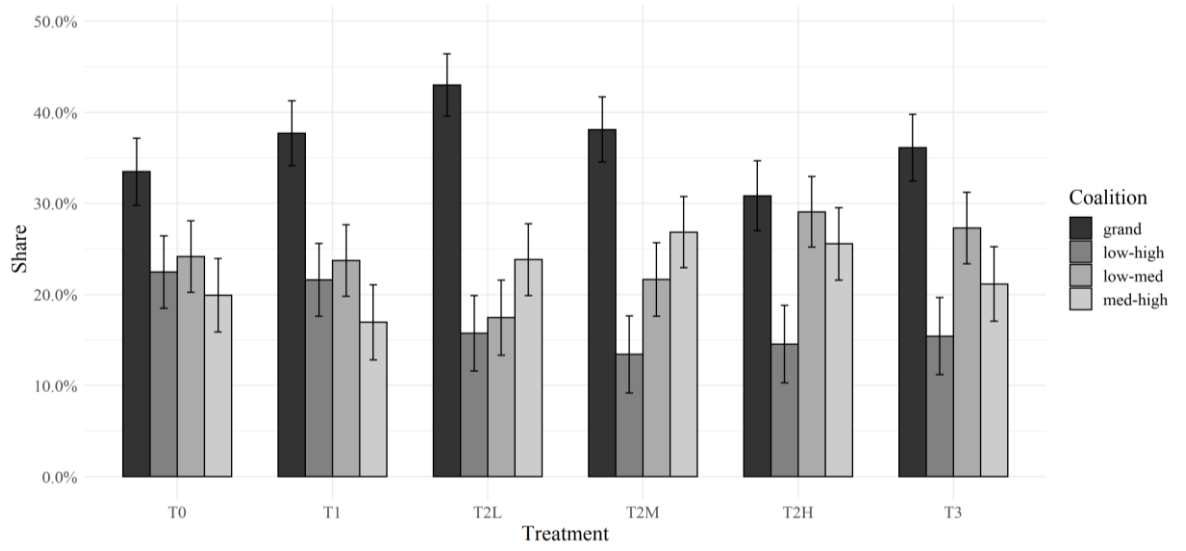


Mean and 95% confidence intervals of total NSR-I

4.3. Coalition formation

The need satisfaction rate and the inequality of payoffs depend on the coalitions that form in the different treatments. Figure 4 presents the coalitions which subjects form in the four treatments depending on their threshold levels. Most often, subjects formed grand coalitions, that is, all group members agreed on the same distribution of allocations. When comparing the main treatments, there are no clear patterns that coalitions form differently across the different group compositions. In all treatments, subjects with low, medium and high need thresholds are equally likely to form a coalition (Chi-squared, $p > 0.10$), with the exception of Treatment 2 (Chi-squared test $p < 0.01$). In all sub-treatments of T2, we find a significant relationship between the need level and forming a coalition. However, in general insiders are not more likely to form coalitions than outsiders (Chi-squared test, $p > 0.10$). In T2L, where the outsiders needs are low, it is more likely that insiders form a coalition (Chi-squared test $p < 0.01$). However in Figure 4 we can see that most of the time the outsider had the same preference as the insiders and thus a grand coalition was formed. Therefore, we have to reject Hypothesis 3a.

Figure 4. Type of Coalitions over the treatments



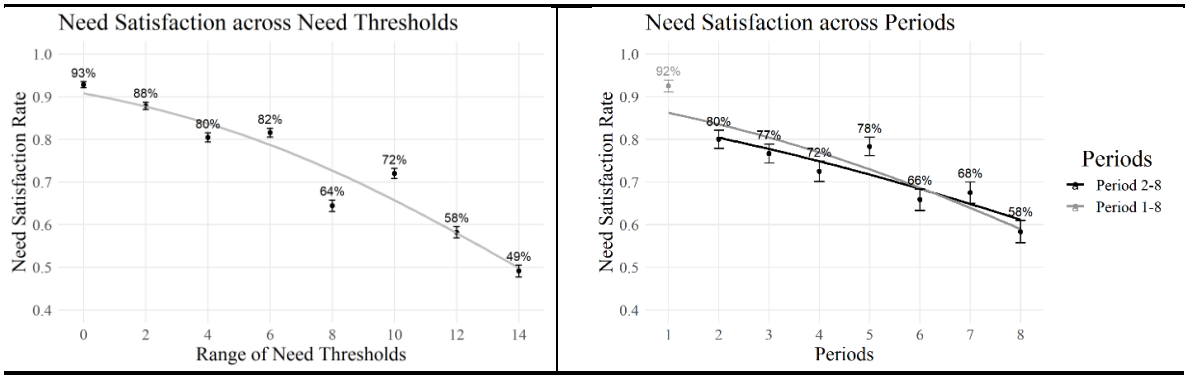
Mean and 95% confidence intervals of total share for coalitions; *grand* describes the coalitions, in which all the three participants agreed on the outcome; *low-high* describes coalitions of players with low and high needs; and accordingly, *low-med* and *med-high* describes coalitions of players with the corresponding needs.

4.4. Need satisfaction rates across threshold scenarios and periods

In Figure 5, we observe a decline in the need satisfaction rate with increasing need thresholds. This pattern is similar across all four main treatments, with slight variations regarding the level of the trend. The results clearly support hypothesis 2 that the group-level need satisfaction rate decreases as the inequality of the need thresholds increases.

Figure 5a. NSR-G across threshold rates

Figure 5b. NSR-G across Periods



Mean and 95% confidence intervals of total NSR-G

Recall, in the first periods of each session we used the same distribution of identical need thresholds (5-5-5) and we varied the other scenarios randomly over the periods. We observe that in periods 2-8 the average need satisfaction rate is generally lower than in the first period

(see Figure A2), which can be attributed to the fact that the thresholds are more unequal. We also observe an overall decline of the NSR-G on the group level over time (Figure 5b grey line). When we exclude the first period, the slope of the estimated slope is less steep (black line), but also negative. This observation contradicts Hypothesis 4, which predicts that social distance will diminish over time, which, in turn, implies an increasing need satisfaction rate (Liebig and Sauer 2016). Even after controlling for the group composition and scenario in the regression analyses, the periods have a significant effect on the need satisfaction rate, being a 20% decrease in the odds of not satisfying the needs over the periods ($p < 0.01$).

To test the effect of the range of the thresholds and the effect of the periods on the NSR-G, we estimated a logit regression (Table 2). In each specification of the model, the need satisfaction rate declines with a rising need range. Similarly, the period of the negotiations has a negative effect on the need satisfaction rate.

Further, we examine the treatment effects. We find that all three main treatments (T1, T2, and T3) differ significantly from T0. When we split up T2, we find that all treatments except T2H significantly differ from T0. T2L differs from T0 the most (Figure A3) - in other words, T2L (the need of the outsider is low) has the highest odds for satisfying everyone's needs in the group compared to T0, and as the outsider's needs are large, the group need satisfaction rate does not differ significantly from T0. Although the mean of the need satisfaction rate is smaller than in T0, it does not significantly differ from it.

We also control for the social demographic variables of the participants (average age in the group *Δage*, average semesters in the university *Δsemester*, average experience in the laboratory *Δexperiments*, and the number of females in the group *#female*). The social demographic variables have no significant effect on the need satisfaction rate on the group level.

Table 2. Need satisfaction across treatments and scenarios

	Main treatments	All treatments	Demographics
(Intercept)	2.79 ***	2.71 ***	2.09 ***
	(2.40, 3.17)	(2.34, 3.07)	(1.16, 3.02)
Session	0.01	0.00	0.00
	(-0.01, 0.02)	(-0.02, 0.02)	(-0.02, 0.02)
Treatment1	0.63 ***	0.63 ***	0.63 ***
	(0.33, 0.93)	(0.33, 0.93)	(0.33, 0.94)
Treatment2	0.44 ***		
	(0.21, 0.68)		
Treatment3	0.33 *	0.33 *	0.35 *
	(0.04, 0.63)	(0.04, 0.63)	(0.05, 0.64)
Treatment2L		1.08 ***	1.08 ***
		(0.75, 1.40)	(0.75, 1.41)
Treatment2M		0.44 **	0.45 **
		(0.14, 0.74)	(0.15, 0.75)
Treatment2H		-0.03	-0.02
		(-0.32, 0.25)	(-0.31, 0.27)
Range of	-0.26 ***	-0.27 ***	-0.27 ***
thresholds	(-0.30, -0.22)	(-0.31, -0.22)	(-0.31, -0.22)
Period	-0.15 ***	-0.16 ***	-0.16 ***
	(-0.19, -0.11)	(-0.20, -0.11)	(-0.20, -0.11)
Δage			0.02
			(-0.01, 0.06)
Δexperience			-0.00
			(-0.02, 0.01)
Δsemester			0.00
			(-0.03, 0.04)
#female			0.03
			(-0.08, 0.13)
N	2880	2880	2880
AIC	3038.10	2979.88	2984.53
BIC	3079.86	3033.57	3062.08
Pseudo R2	0.14	0.16	0.17

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

The dependent variable is the probability of the third (i.e. excluded) player having her need threshold satisfied (1) or not (0). We control for age (*Δage* describes the average age in the group), experimental experience (*Δexperience* is the average number of experiments in which subjects participated), for the average number of semester (*Δsemester* is the average number of semesters in the group) and for gender (*#female* number of females in the group)

5. Conclusion

A well-established argument in the literature is that the willingness to satisfy others' needs increases as the social distance between the involved subjects declines: The closer are social relationships, the more encompassing is the mutual understanding of particular life situations and the larger is solidarity with people in need. In a laboratory experiment we have employed in stage 1 a group task to raise solidarity in groups of three and we have then systematically reallocated group members into new treatment groups in stage 2. The composition of these groups ranged from no group task (T0) via all group 2 members come from a different group 1 (T1) and two group 2 members come from the same group and the third member from a different group (T2) to all group members come from the same group (T3). In stage 2, two group members must agree on an allocation of an endowment to the three group members, conditional on individual thresholds of a minimal allocation needed for the possibility to earn additional points in stage 3 of the experiment. In T2, the threshold of the member from a different group than the other two is systematically varied from lowest via middle to highest.

Our key finding is twofold: First, social distance alone does not seem to affect the willingness to satisfy other's needs in the designed laboratory context. On average, need satisfaction in the setting that most likely produces disregard of individual interests, the insider-outsider situation in T2, does not significantly deviate from the other treatments. However, second, we find a strong effect of the outsider's threshold in this setting: The larger the outsider's need, the less often is this need satisfied. Hence, the average null effect of social distance on need satisfaction conceals the fact that insiders do indeed discriminate against outsiders if their needs are large and require a transfer from the insiders to the outsider which implies an allocation to the outsider which exceeds the share of an insider. In consequence, we conclude that behavior in this laboratory experiment does not generally respond to induced social distance, but that larger social distance reduces the willingness of insiders to satisfy large needs of outsiders.

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7. Appendix

Figure A1a. Actual final payoff inequality

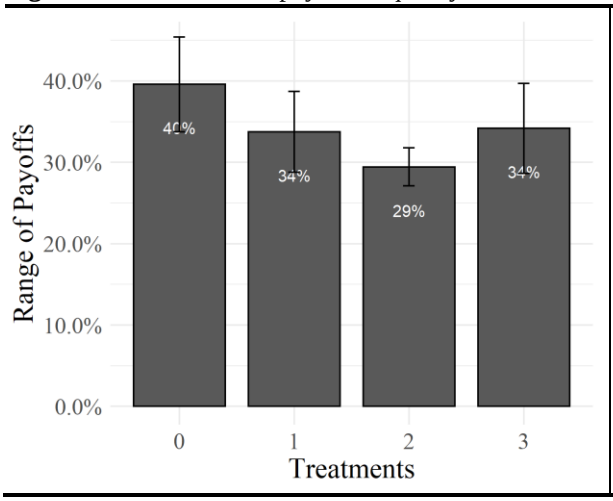
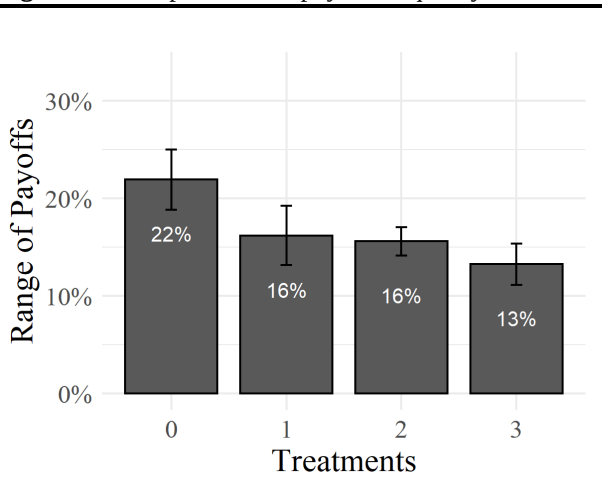


Figure A1b. Expected final payoff inequality



Mean and 95% confidence intervals of total NSR-G

Figure A2a. NSR-G over treatments in the first period and in period 2-8

Figure A2a. In period 1

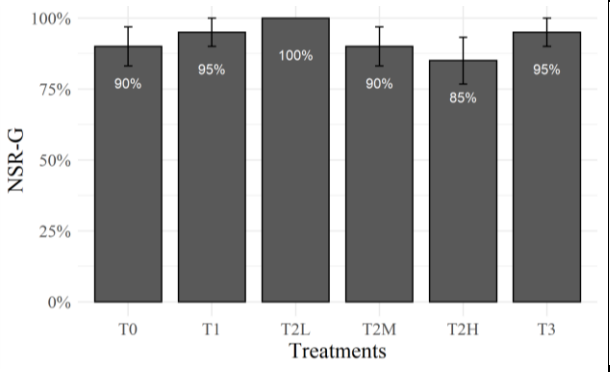
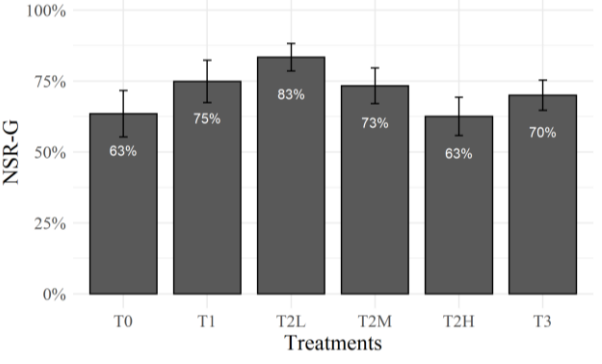
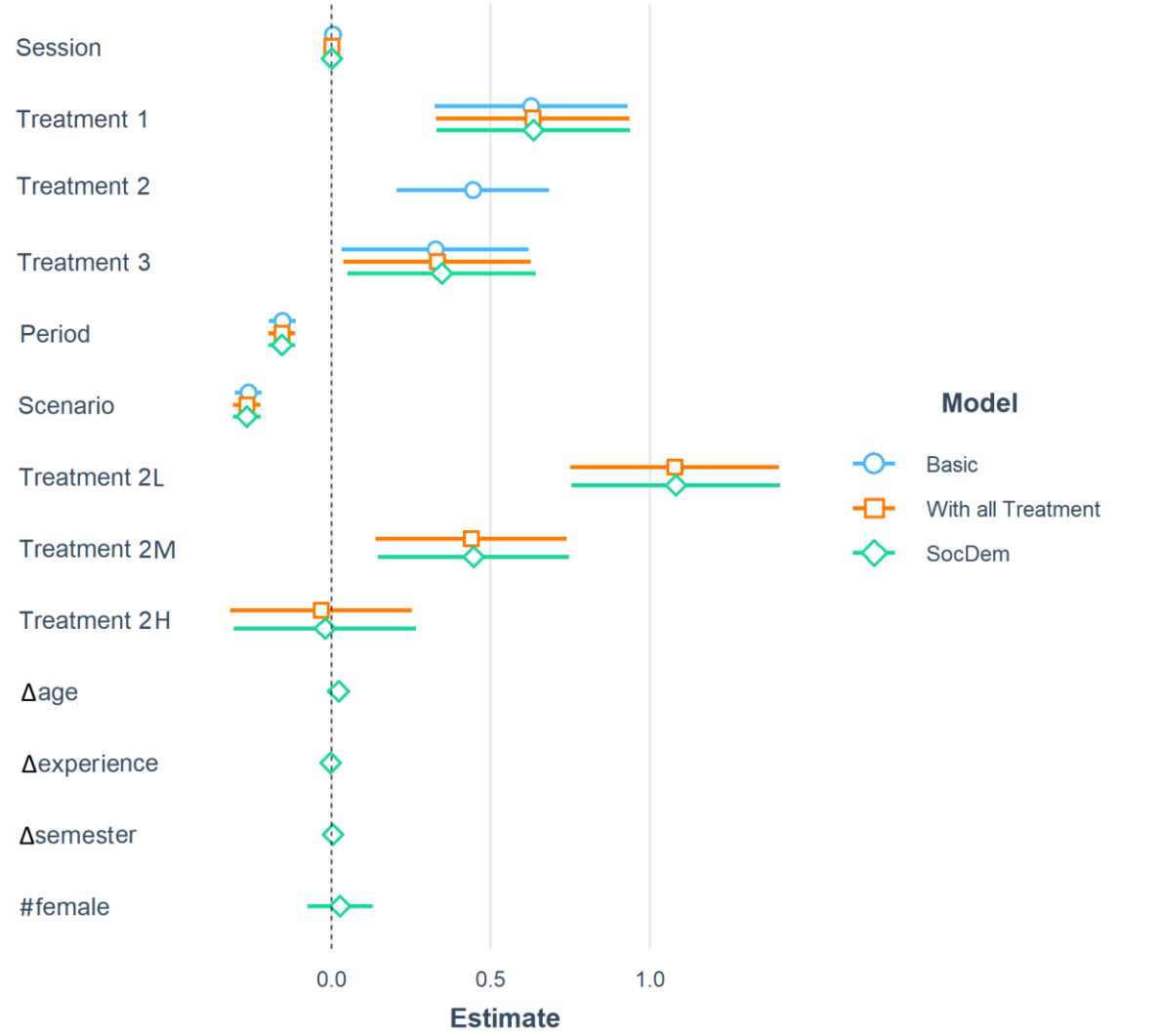


Figure 4b. In period 2-8



Mean and 95% confidence intervals of total NSR-G

FigureA3. Logistic regression



The dependent variable is the probability of the third (i.e. excluded) player having her need threshold satisfied (1) or not (0)

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