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Group Membership and Communication in Modified Dictator Games



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Klemens Keldenich¹

Group Membership and Communication in Modified Dictator Games

Abstract

This paper presents a laboratory experiment to measure the effect of group membership on individual behavior in modified dictator games. The results suggest that this effect is influenced by the degree of group membership saliency. A within-subject design is employed: in stage 1, each subject decides individually; in stage 2, the subjects are divided into groups of three and one person is selected at random from each group to make the decision (the “hierarchical decision rule”). In stage 3, additional pre-play communication in the group is allowed before the decision and, in stage 4, the decisions are again made on an individual basis. Interestingly, the dictators behave more selfishly when group members are not allowed to communicate. However, if groups are allowed to communicate, decisions do not differ from individual choices. Chat content shows that groups are concerned with reaching a consensus, even though talk is “cheap” and only one group member will make the binding decision.

JEL Classification: C91, C92, D71

Keywords: Group decision making; social comparison; leadership; communication

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1 Introduction

Many important economic decisions are made by teams rather than by individuals. Examples for these decisions include decisions about consumption and savings, “virtually all significant strategic decisions by corporations” (Cooper and Kagel, 2005), central bank decisions regarding monetary policy (Blinder, 2007), or investment decisions by mutual funds (Prather and Middleton, 2002). To capture all relevant aspects of decision situations like these, it is therefore important to see if groups behave differently than individuals. Recently, group behavior has become the focus of many economic studies which can be divided into two main categories. The first one looks at groups which have to come to a consensus decision and where no payoff conflict is present. Following Sutter (2009), this approach is called team decision making. The second, more recent area of investigation examines whether group membership alone is sufficient to cause a change in behavior.

The results of team decision making studies usually show that teams are closer to the standard game-theoretic predictions in the ultimatum game, thus choosing lower offers as proposers and accepting lower offers as responders (Bornstein and Yaniv, 1998), and send and return smaller amounts in an investment game (Cox, 2002 and Kugler et al., 2007). Furthermore, teams exit a centipede game earlier than individuals (Bornstein et al., 2004) and show higher levels of rationality in beauty contests, thus outperforming individuals (Kocher and Sutter, 2005). While most of these studies show that groups are more rational and / or selfish, Cason and Mui (1997) find that groups are more generous in the dictator game.¹ Similar results can be found in studies of non-strategic tasks. For example, a study on portfolio selection by Rockenbach et al. (2007) shows that teams are better at making the trade-off between risk and higher expected payoff and a study by Charness et al. (2007a) demonstrates that teams are better than individuals at following the principles of Bayesian updating.

The second area of study looks at the effect of group membership alone. Here, one can differentiate between naturally occurring groups and induced group membership. As an example, Bernhard et al. (2006) study different native social groups in Papua New Guinea using a dictator game with third-party punishment. They find ingroup favoritism in sharing decisions and norm enforcement. From a study of different ethnic groups in Vietnamese village communities, Tanaka

¹Although a follow-up study by Luhan et al. (2009) arrives at the opposite result.

et al. (2006) suggest that the effect of group membership depends on the respective status of the groups concerned. Finally, Goette et al. (2006) look at different platoons in the Swiss army as groups and find that cooperation in a prisoner’s dilemma game increases with ingroup players. Studies with induced group membership allow more control by the experimenter, thus making it possible to vary the strength of the group membership. Eckel and Grossman (2005) use a public good game to this end and find that “just being identified with a team is, alone, insufficient to overcome self-interest.” However, strengthening group identification, for example through problem solving exercises, leads to higher contributions and less free-riding in the public good game. Similar results are found by Charness et al. (2007b) using prisoner’s dilemma and battle-of-the-sexes games. When group membership is sufficiently salient, it significantly alters individual behavior.

This study lies at the intersection of these two literature areas. While it uses communication and payoff commonality as in team decision making studies, it isolates the group membership effect by introducing a hierarchical decision rule. This is innovative in two respects: firstly, the decision rule allows a clear comparison between decisions made by an individual as part of a group and acting alone. Secondly, the content of the communication is recorded, so that possible reasons for the effect of group membership can be analyzed. The paper mainly focuses on the difference in the way subjects behave when they are part of a group compared to when they are acting alone. The main results of this paper are as follows: While introducing group membership through payoff commonality makes subjects more selfish, the decision in a group with pre-play chat communication is not different from the individual decision. Furthermore, when communication in the group is allowed, a consensus decision is actively sought after, even though the decision rule does not need the agreement of all group members. The communication content shows that the group members are aware of the decision rule, but still seek to influence the final decision.

2 Experimental Design

2.1 Structure

To study the effect of group membership on behavior, a four-stage experiment with a within-subject design is conducted. In each stage a modified dictator game (introduced by Andreoni

and Miller, 2002) is used as the base game. Individual behavior in the modified dictator game has been analyzed by Bardsley (2008) and List (2007), who both find that modifying the game's structure, i.e. the addition of a taking option, influences outcomes significantly compared to the standard dictator game. The modified dictator game is used here as it allows a wider range of behavior for the subjects, making it easier to detect the possible effect of group membership. At the end of the experiment, one stage is randomly chosen and payed out². Upon arrival, subjects are randomly divided into Dictators and Receivers and retain these roles throughout the whole experiment. The roles are called "Type A" (Dictator) and "Type B" (Receiver) for the participants. Before each stage, new instructions about the stage are distributed. All participants receive the same instructions³.

In the first stage (called *Individual I*, see Figure 1 for an overview), both Dictators and Receivers are given EUR 12 as an endowment. The Dictators decide if they want to keep the endowment, take away money from their randomly assigned Receiver, or give him money from their own endowment. Transfers are only allowed in integers of 1 Euro. Thus, possible divisions range from EUR 24 for the Dictator and EUR 0 for the Receiver to EUR 0 for the Dictator and EUR 24 for the Receiver.

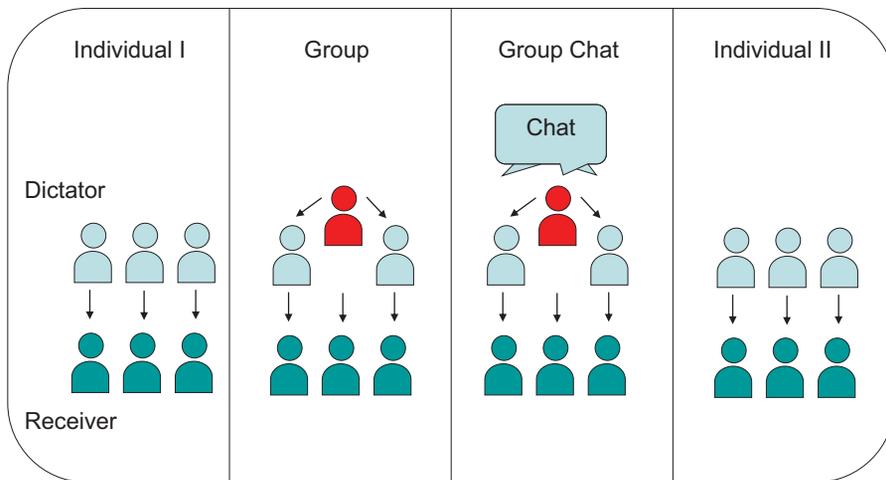


FIGURE 1: Overview Experimental Design

²Baltussen et al. (forthcoming) provide an overview of the commonly used method of paying only one randomly selected decision from a sequence of decisions.

³See Appendix for a complete set of instructions.

In the second stage (*Group*), the Dictators are randomly divided into groups of three and each Dictator is matched anew to a Receiver. Every participant receives a new endowment of EUR 12. Now, Dictators have to decide for the whole group including themselves how to split the money between each Dictator and his assigned Receiver. A variant of the strategy method⁴ is used to determine the binding decision for all group members: Each Dictator in the group has to decide on the split and one of the decisions is randomly chosen afterwards to be the binding one for the group. This decision is then applied to all members of the particular group. Dictators do not get any information on which decision was binding in the group. The matching of one Dictator to one Receiver is kept to avoid that Dictators change their behavior because they are now dealing with a group instead of dealing with an individual. Sutter et al. (2009) for example argue that when interacting with a group instead of an individual, an out-group scheme is recalled which renders the interaction “competitive, deceitful and aggressive” (see also Pemberton et al., 1996).

In the third stage (*Group Chat*), the Dictators are again randomly divided into groups of three, where the subjects are labeled “Number 1”, “Number 2” and “Number 3”. Each group can communicate internally via electronic chat for five minutes. The chat is set up in a way that all group members can see all messages, it is not possible to write a message to a single group member. All messages stay visible during the five minutes, so one group member can look back to the beginning of the chat and see what has been written. After the chat, the subject labeled “Number 3” makes one decision which is binding for all group members, including himself. This decision rule is known to all group members before the chat. In addition, the group members labeled “Number 1” and “Number 2” are asked how they would have decided in the position of “Number 3”. An electronic chat is used as it is easy to record for subsequent analysis, retains a high level of anonymity (compared to face-to-face or audio chat), and is natural for participants. The subjects were informed that they can communicate only just prior to the third stage, they did not yet know about the future communication in the second stage.

The fourth and final stage (*Individual II*) consists again of an individual modified dictator game with new random matching. After the last stage, Dictators and Receivers are informed about the result of every stage and one stage is randomly chosen to be payed out.

⁴See Selten (1967).

2.2 Procedures

The experiment was programmed with z-Tree (Fischbacher, 2007) and conducted at the “Essen laboratory for experimental economics” (efe) in June 2010. Subjects were recruited by the online recruiting system ORSEE (Greiner, 2004). After the experiment, payoffs were made separately. The participants were undergraduate students from the University of Duisburg-Essen; their fields of study included business administration, economics, law, languages, and others. The experiment as a whole lasted about 60 minutes, including payoff time. Average payoff was EUR 12 with the highest payoff being EUR 24 and the lowest one EUR 0. Four sessions with 24 participants each were conducted, leading to a total of 96 subjects.

3 Research questions and expectations

3.1 Theoretical Background

Standard economic theory focuses on individual-level incentives in decision making and thus has no place for group membership effects. If in addition the assumption of selfishness holds, the Dictators should take all of the endowment in all four stages, leading to the following hypothesis:

Selfish: *“The Dictators will take all of the endowment in all 4 stages.”*

Of course, prior research using the modified dictator game (see Bardsley, 2008 and List, 2007) has shown that such purely selfish behavior is seldomly observed. Still, it is useful as a simple and clear baseline to measure behavior against. While social preferences introduced other people’s payoffs into an individual utility function and therefore leave the selfish assumption, this is not affected by group membership either. So the existence of some kind of social preferences can be used to explain why Dictators do not take the maximum amount for themselves, but is not sufficient to account for changes between the stages. If therefore group membership has no influence on behavior, the following hypothesis can be formulated:

Group: *“The group leaders’ decisions will not change between the stages Individual I and Group.”*

In contrast to standard economic theory, social psychology has a long tradition in analyzing group membership effects. The “Group Polarization Hypothesis” based on two underlying theories is a possible explanation for these effects. This hypothesis, first presented by Moscovici and Zavalloni (1969), states that “the average postgroup response will tend to be more extreme in the same direction as the average of the pregroup responses.” It is stated for cases in which communication among the group is allowed.

This shift may have an informational or a normative explanation. The dominant informational explanation is the “Persuasive Argument Theory”, while the normative explanations stress the tendency of group members to compare themselves with others and the wish to be perceived positively and is formalized in the “Social Comparison Theory” (SCT). According to the “Persuasive Argument Theory” (PAT), people are influenced by the number and persuasiveness of pro and contra arguments that they can recall from memory when making decisions. In a group, arguments are pooled, so the initial positions are enhanced by more arguments. This influence consists of the observation that a discussion generates arguments which predominantly favor the initially preferred alternative. The “Social Comparison Theory” provides a second theoretical explanation for the Group Polarization phenomenon. It states that people are motivated both to perceive and to present themselves in a socially desirable way. Furthermore, people tend to perceive themselves as more favorable than what they believe to be the average tendency. According to the “Group Polarization Hypothesis”, group discussion moves the decision into the direction of initial tendency. This means that the group’s leader is influenced by the other group members’ preferences which they can communicate during the chat. The amount of money divided is held constant on an individual level, so there is no incentive to change behavior. In addition, no consensus decision in the group is needed, as one group member is randomly picked to make the binding decision. Thus, no compromise is necessary and every Dictator can decide purely according to her preferences. This ensures that the group membership is the only variable which changed. Following this, the third hypothesis is defined as follows:

GroupChatA: *“The group leaders’ decisions will change between the stages Individual I and Group Chat in the direction of the median decisions of all group members.”*

The same should happen to the hypothetical offers by the group members who do not have

the leader role and whose offers are therefore not payoff-relevant. These hypothetical decision may be even more influenced by the wish to appear socially desirable, because this does not incur any costs for the group members: As their decisions do not have payoff consequences, they do not have to suffer the utility loss associated with receiving less money. They can conform to the social norm without costs to themselves. From this reasoning, another hypothesis can be derived regarding the behavior after the pre-play communication:

GroupChatB: *“The group members’ hypothetical decisions will change between the stages Individual I and Group Chat in the direction of the median decisions of all group members. This difference will be more pronounced than the one for the group leaders.”*

In stage *Individual II*, the subjects decide individually again. Looking at the behavior in this stage, it is necessary to distinguish between the two possible underlying causes of the “Group Polarization Hypothesis”. If one follows the “Social Comparison Theory”, a possible change in behavior is only due to the desire to be perceived in a certain way by the group members. In stage *Individual II* of the experiment, this is no longer the case and the leader’s offer should fall back to the initial offer he made in stage *Individual I*:

SCT: *“The Dictators’ decisions will not change between the stages Individual I and Individual II.”*

However, if the “Persuasive Argument Theory” is the cause of the polarization, the arguments presented by the other group members have influenced the leader. Assuming that the subjects can still recall the arguments from stage Group Chat, the change in behavior should be permanent, meaning that there will be a change in the decisions made between the two individual stages. Additionally, as the group members have been influenced by the very same arguments, the final hypothesis regarding Dictator behavior is defined as follows:

PAT: *“The Dictators’ decisions change from stage Individual I to Individual II in the direction of the group decision.”*

The effect of group membership on social preferences which incorporate other people’s payoffs

into a utility function has been analyzed by Chen and Li (2009) using several games⁵. In short, all of their results are compatible with the hypothesis that participants are more altruistic towards an ingroup match. The analysis presented here uses a similar theoretical framework of group membership or group identity, but differs with regard to the treatment: The counterpart of the subject whose behavior is analyzed is kept constant, i.e., the Dictators always interact with one Receiver who is not part of a group. Instead, group membership is introduced as the treatment variable.

4 Results

4.1 Group Membership

In stage *Individual I*, subjects decide individually without any induced group membership. The average amount taken by the Dictators is EUR 2.67 (median EUR 1). The decisions range from taking EUR 12 (thus taking away all of the Receiver’s endowment), to giving EUR 2 to the Receiver with an overall standard deviation of the Dictators’ payoff of 4.12. Clearly, the behavior formulated in hypothesis *selfish* can be rejected⁶. In all four stages, Dictators share the endowments to some degree. This behavior is in line with existing Dictator Game studies and can be explained with a heterogeneous population of agents, where some individuals have some kind of other-regarding preferences while others follow the classical, perfectly selfish payoff maximization⁷.

In stage *Group*, Dictators keep on average EUR 15.6 (median EUR 14) for themselves (see Figure 2). They, thus, take away roughly one Euro more from the Receivers when they act for the group than when they act alone. This change in behavior implies that hypothesis *Group* can be rejected at the 10% level ($p = 0.075$ using a two-sided Wilcoxon Signed Rank test). Being part of a group already changes subjects’ behavior towards being more selfish and less other-regarding. A closer look at the data reveals that 47.9% of the Dictators did not change their behavior when

⁵The games they use are 5 two-person dictator games and 16 two-person response games with varying costs of transfer.

⁶In all stages, the difference between taking everything and the observed behavior is significant at the 1% level, using both a Wilcoxon test for a single sample or a simple t-test.

⁷This well established incorporation of other agent’s payoffs into the utility function can be modeled using several different approaches. These include Rabin (1993), who add a notion of fairness to standard game theory, or Bolton and Ockenfels (2000) and Fehr and Schmidt (1999) who assume inequality aversion of the subjects. However, this paper does not focus on the modeling of the individual behavior but on the potential change in behavior caused by group membership.

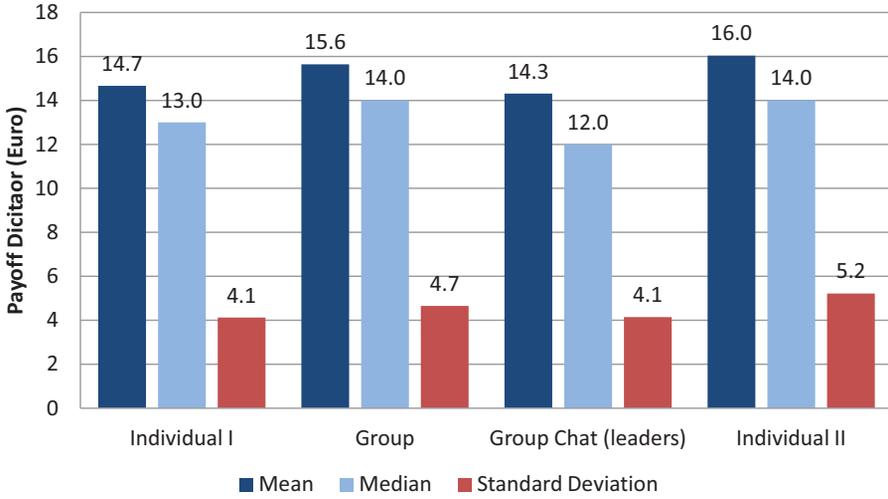


FIGURE 2: Aggregate Dictator decisions

becoming part of a group, 35.4% took more away from the Receivers while the remaining 16.7% took less away. The distribution of decisions is very similar with two clear peaks at the equal split and the perfectly selfish decision (Figure 3).

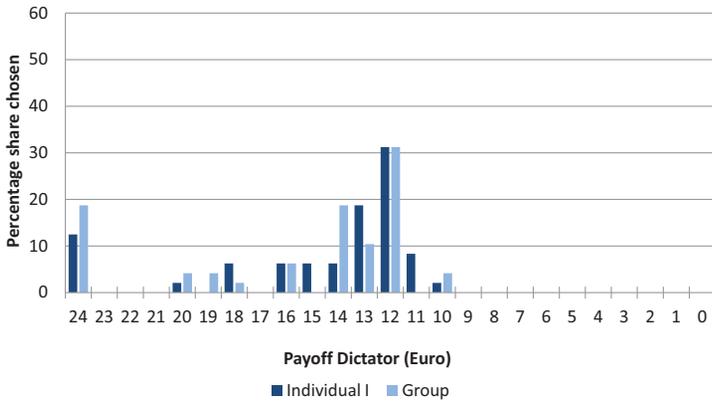


FIGURE 3: Distribution of Dictator decisions, stage *Individual I* and *Group*

Stage *Group Chat* introduced the opportunity to chat as an additional component of group membership. The average amount the Dictators now kept for themselves was EUR 14.3, compared to EUR 14.67 in stage 1 and EUR 15.6 in stage 2. First, only the decisions by the

predetermined group leaders are taken into account: The difference in decisions both between stages *Individual I* and *Group Chat* and between stages *Group* and *Group Chat* are insignificant⁸; therefore hypothesis *GroupChatA* can be rejected. Being in a group with communication did not change the leaders' behavior compared to the same subjects acting totally alone. Looking at the individual change in behavior, 44% of the subjects made the same decision in stage *Group Chat* as stage *Individual I*, while 25% took more away and 31% took less away. This balanced behavior explains the result that no difference in the aggregate behavior between these two stages is observed. The distribution of Dictator decisions now moves away from the selfish distributions towards the equal split, with more than 55% of groups choosing this outcome (see Figure 4).

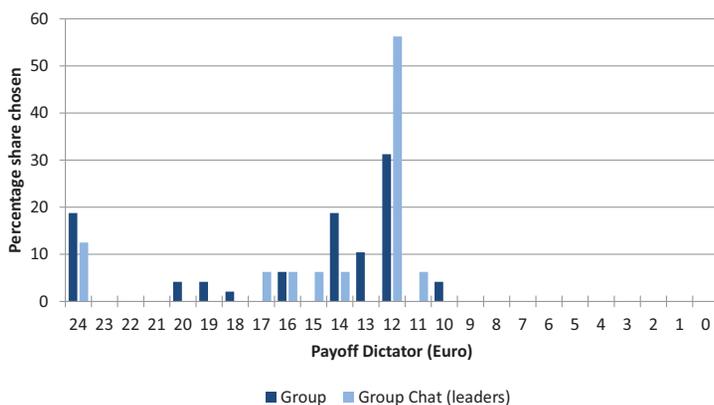


FIGURE 4: Distribution of Dictator decisions, stage *Group* and *Group Chat*

Hypothesis *GroupChatA* can be analyzed further by looking at the reaction of the leaders to the group members' preferences. As a proxy for the group members' preferences, one can look at their individual decisions in stage *Individual I*. 44% of the group leaders actually decided differently in stage *Group Chat* after the chat compared to stage *Individual I*. Of these changes, 78% changed in the direction of the group members' median decisions from stage *Individual I*. This may serve as an indicator that either the social comparison to the members of their own group or the arguments presented during the discussion serves as a motivation for some of the leaders to change their decision. However, this is unlikely as the majority of the group leaders do not change their decisions from stage *Individual I* to stage *Group Chat*. Of these, 71%

⁸Comparing stages *Individual I* and *Group Chat* results in a p-value of 0.493; comparing stages *Group* and *Group Chat* results in a p-value of 0.866. Both times a Wilcoxon Signed Rank test is used.

encountered a group median different from their own preference. Consequently, they choose to stick to their original decision in spite of being confronted with arguments for other decisions and a social comparison which deviated from their own decision. Only two group leaders became more other-regarding despite their group members displaying preferences for more selfishness, while a more selfish group median always leads to more selfish decision of the leader. This indicates that following the group's social norm is easier for the leaders when this means a higher own payoff. This is reminiscent of the idea in social preferences where an upward deviation in payoff gives less disutility than a downward deviation (Fehr and Schmidt, 1999).

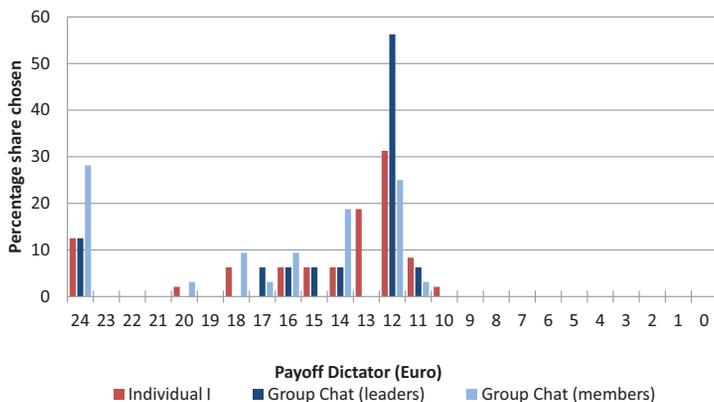


FIGURE 5: Distribution of Dictator decisions, group leaders and members

The group members hypothetically take away on average EUR 3.33 (median EUR 1) in stage *Group Chat* compared to an average of EUR 3.25 (median EUR 1) in stage *Individual I*. Thus, hypothesis *GroupChatB* can be rejected as the group members do not behave differently after the group communication than when they decided individually. The group members were not influenced by the social norm expressed in the group or by the arguments exchanged in the discussion, even though a change in their decision would have been costless to them, as the binding decision was made by the leaders.

In stage *Individual II*, Dictators again acted individually and on average take away EUR 4 (median EUR 2) from their Receivers. This is significantly different ($p=0.019$, Wilcoxon Signed Rank test) from their behavior in stage *Individual I*. Therefore, hypothesis *SCT* can be rejected. While there is a difference, the behavior does not move into the direction of the group decision, thus hypothesis *PAT* can also be rejected. The behavior in stage *Individual II* is not significantly

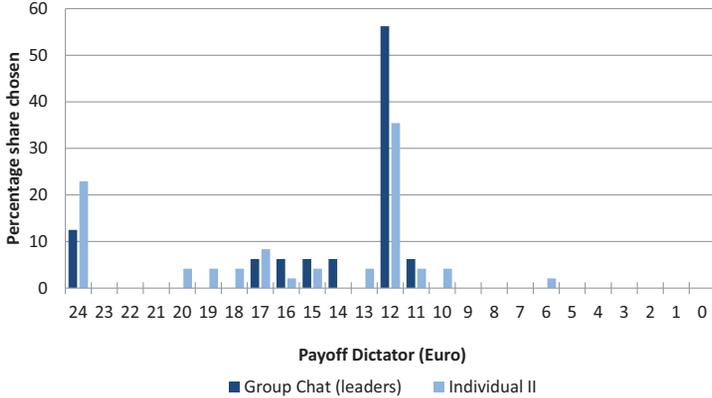


FIGURE 6: Distribution of Dictator decisions, stage *Group Chat* and *Individual II*

different from the behavior in stage *Group* (mean EUR 3.6 taken away, median EUR 2), where they decided as part of a group without communication or from the behavior in stage *Group Chat*, where communication was allowed. This points to a lasting effect of the group membership and the group discussion which took place in the preceding stages. One possible explanation is that while group membership per se drives decisions in a more rational and selfish direction, the communication aspect of group membership highlights arguments which are concerned with a socially accepted decision, thus making group members on average more other-regarding. As soon as the communication is not possible anymore, subjects then fall back to their new, more selfish behavior. This becomes also clear when looking at the distribution of divisions from stage *Group Chat* and stage *Individual II* (Figure 5). The clear peak at the equal split from stage *Group Chat* gets smaller and the decisions move back towards the more selfish divisions.

Looking at hypothesis *SCT* and *PAT* from the group members' perspective, the group members took away EUR 3.3 on average in stage *Individual I* (median EUR 1) while in stage *Individual II* they took away EUR 4.9 on average (median EUR 4.5) from their assigned Receivers. Although both decisions were made individually, this difference is weakly significant ($p=0.077$) using a two-sided Wilcoxon Signed Rank test. So while they did indeed change their behavior, they did not change it in the direction of the group decision, thus again both hypotheses *SCT* and *PAT* can be rejected.

4.2 Individual patterns

Finally, a way of looking at the agents' behavior is a classification of their behavior into different types. Figures 3 to 5 have indicated that there are two clear peaks in the distribution of Dictator decisions throughout the stages: At the perfectly selfish decision and at the equal split. Figure 7 shows a classification of agents into a "selfish type" (all agents taking away at least EUR 3 from their assigned Receiver) and an "equal type" (all agents taking away a maximum of EUR 2). There is no significant difference regarding the the type distribution (using a McNemar test) between the first two stages or between stages *Group* and *Group Chat*.

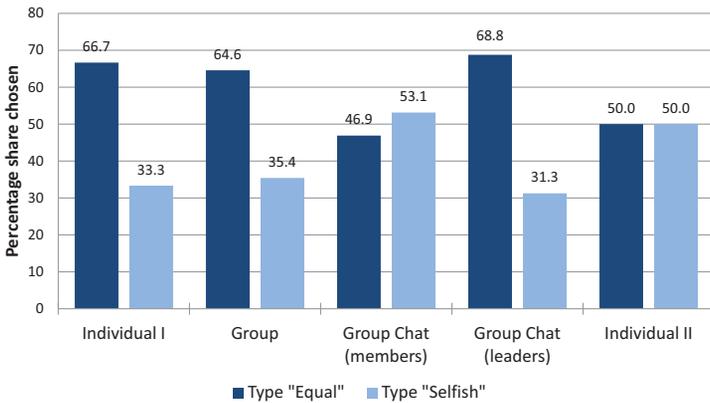


FIGURE 7: Types of agents through the four stages

However, splitting the sample between the group leaders and the group members reveals a divergence in the type classification. The subjects who actually had to make the binding decisions can be classified as 68.8% "equal type" and 31.3% "selfish type", while among those subjects who only made a hypothetical decision this division is only 46.9% "equal type" and 53.1% "selfish type". This can be interpreted in a way that the group members are aware that their decision will not influence the Receivers and thus allows them to decide only according to the payoff of themselves and their group members.

4.3 Chat Analysis

Looking at the chat content illuminates how the decision process in the group developed. Quantitatively, the average five-minute chat included 1035 characters or 36.3 messages. The minimum

of messages exchanged during a group discussion was 15, while at most 65 messages were sent during the allotted five minutes. On average, 35% of the chat was contributed by the leader, 38% by the member designated “Number 1” and 26 % by the group member designated “Number 2” when measured by the number of characters. This distribution is not significantly different from an equal distribution using a Kolmogorov-Smirnov test. As the decision rule was clear for all participants and the decision situation was well known to the participants, such extensive communication was not necessary. Still, both leaders and members used up most of the given time. For the two group members, this suggests that they anticipated that the leader may be influenced by their preferences or arguments.

Looking at the content of the chat messages, six topics can be identified that are discussed most often: fairness, own payoff, voting / compromise, decision rule, morality and the question of earning or deserving the payoff. Table 1 gives an overview how many groups and subjects have discussed these topics and how many messages are sent containing one or more these topics, it furthermore includes a typical example for each topic.

TABLE 1: Frequencies of topics mentioned during chat

Topic	% groups	% subjects	# messages	Example
Fairness	50	31.3	19	I would prefer a fair division of 12
Own Payoff	62.5	31.3	23	Let’s make some real money here!
Voting	81.3	35.4	25	We should vote on this
Decision rule	87.5	35.4	21	Well I decide for you
Morality	43.8	22.9	15	I think this whole thing is a little mean
Deserving	12.5	8.3	5	I mean we’ve all had the same task

The decision rule was communicated to every group member and judging by the frequent mentioning everybody understood what it implied. Thus, all communication was only cheap talk for the leader making the final decision. Still, in most of the groups the members try to reach a consensus and talk about a possible vote or compromise. If a consensus is actually reached during the discussion, the leader always adheres to this, even if this means deviating from her decision in the previous rounds. The fact that no group leader deviated from the

intention they stated during the chat might be explained with a general aversion to lying, see for example Fischbacher and Heusi (2008) or Mazar and Ariely (2006). It is interesting to note that in all but two groups it is the leader who is actively asking for the group members' preferences. However, a clear influence of the discussed topics on the final decision can not be found⁹.

5 Conclusion

When determining the influence of group membership on individual behavior, it is necessary to define what exactly group membership entails. This study shows that group membership induced by payoff commonality leads to more selfish behavior if not accompanied by communication. However, when communication among the group is added, the effect disappears and subjects behave no different in the group than individually. This might be one reason for the divergent results in the literature on group membership. In general, the influence of group membership in this setup is fairly weak, giving no substantial support for either Social Comparison Theory or Presuasive Argument Theory. The analysis of the chat content reveals that in spite of the clear decision rule, groups engage in extensive communication and group members try to sway the leader towards their preferences. The other side of this behavior is the leader herself, who in 81% of the groups actively seeks the input of the other group members. The different theories of Social Preferences predict that individuals care in some way for the payoff of the other agents. Here, the leader's payoff and that of the members is always equal per the hierarchical decision rule. Therefore, the leader asking for the group members' preferences shows that he is aware that they may have different utilities associated with different payoffs. The leader not only cares for the payoff the other group members receive, but for the utility they derive from this payoff.

⁹Using a regression with dummy variables for the different categories as explaining variables, and the leader's decision as dependent variable.

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Appendix

General Instructions¹⁰

Welcome to the experiment and thank you for participating! Please read the instructions carefully. Please do not communicate with the other participants from now on. If you have a question, please raise your hand! We will come to your seat and answer your question. If you do not follow these rules, you unfortunately have to stop the experiment and will not receive any payment.

During the experiment, you can earn money depending on your choices and the choices of the other participants.

The experiment consists of four independent parts. There is no connection between the decisions in each of the parts. Before every part you will receive separate, detailed instructions. All instructions are identical for all participants. At the end of the experiment, one of the four parts will be randomly chosen. Your payoff from this experiment will be the amount of money you earned in this part. In all four parts your interaction partner is randomly determined anew.

Types of participants

At the beginning of the experiment, all participants are randomly assigned to a type (type A or type B). One half of the participants is assigned to type A, the other half is assigned to type B.

The assignment to type A or type B stays the same during the whole experiment.

The first part of the experiment starts now.

¹⁰This is the English translation of the originally German instructions.

Instructions stage *Individual I*

First part

Every type A participant is randomly assigned to one type B participant. You will not learn about the identity of your assigned participant, neither during nor after the experiment. Thus, your decisions are completely anonymous.

Basic endowment

Every participant receives a basic endowment of EUR 12.

Decision

Every type A participant has to make a decision: Type A can either leave the basic endowments unchanged, he can take away money from the basic endowment of his assigned type B participant, or he can give money from his own endowment to his assigned type B participant. A possible transfer is only allowed in increments on EUR 1. This results in the following possible distributions:

Payoff type A (EUR)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Payoff type B (EUR)	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Information

Afterwards, every type B participant will be informed about the decision his assigned type B participant has made.

Payoffs

At the end of the experiment, one of the four parts will be randomly chosen. The decision in this part will then determine the payoffs of the participants.

Instructions stage *Group*

Second part

All type A participants are randomly assigned to groups. Three type A participants form one group. In each three-person group, the numbers 1, 2, and 3 are randomly assigned to the participants. Again, one type B participant is randomly assigned to every type A participant.

Basic endowment

Every participant receives a basic endowment of EUR 12.

Decision

Every type A participant has to make a decision: Type A can either leave the basic endowments unchanged, he can take away money from the basic endowment of his assigned type B participant, or he can give money from his own endowment to his assigned type B participant. A possible transfer is only allowed in increments on EUR 1. This results in the following possible distributions:

Payoff type A (EUR)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Payoff type B (EUR)	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

One group member is randomly chosen. The decision of this group member is binding for all three group members.

Information

Afterwards, every type B participant will be informed about the decision his assigned type B participant has made, respectively about the decision the randomly chosen group member has chosen.

Payoffs

At the end of the experiment, one of the four parts will be randomly chosen. The decision in this part will then determine the payoffs of the participants.

Instructions stage *Group Chat*

Third part

Again, all type A participants are randomly assigned to groups. Three type A participants form one group. In each three-person group, the numbers 1, 2, and 3 are randomly assigned to the participants. Again, one type B participant is randomly assigned to every type A participant.

Basic endowment

Every participant receives a basic endowment of EUR 12.

Decision

The group members can talk with each other for 5 minutes via electronic chat. There is no contact with the assigned type B participants. During the electronic chat, the messages of participant number 1 are marked with “1”, the messages of participant 2 are marked with “2”, and the messages of participant 3 are marked with “3”. This designation is only meant to distinguish the different group members. During the electronic chat, you are not allowed to say your name, or give other hints to your identity. Anonymity among the group members stays intact. The content of the electronic chat is recorded for subsequent analysis.

After the electronic chat, the participant with the number 3 has to make a decision: Type A can either leave the basic endowments unchanged, he can take away money from the basic endowment of his assigned type B participant, or he can give money from his own endowment to his assigned type B participant. A possible transfer is only allowed in increments on EUR 1. This results in the following possible distributions:

Payoff type A (EUR)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Payoff type B (EUR)	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

The decision of the participant with the number 3 is binding for all group members. After participant number 3 has made the decision, participants number 1 and 2 are asked how they would have decided in his place without knowing his actual decision. The decision by participant 1 and 2

has no influence on the payoffs.

Information

Afterwards, every type B participant will be informed about the decision his assigned type B participant has made, respectively about the decision participant number 3 has made for the group members.

Payoffs

At the end of the experiment, one of the four parts will be randomly chosen. The decision in this part will then determine the payoffs of the participants.

Instructions stage *Individual II*

Fourth part

Every type A participant is randomly assigned to one type B participant. You will not learn about the identity of your assigned participant, neither during nor after the experiment. Thus, your decisions are completely anonymous.

Basic endowment

Every participant receives a basic endowment of EUR 12.

Decision

Every type A participant has to make a decision: Type A can either leave the basic endowments unchanged, he can take away money from the basic endowment of his assigned type B participant, or he can give money from his own endowment to his assigned type B participant. A possible transfer is only allowed in increments on EUR 1. This results in the following possible distributions:

Payoff type A (EUR)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Payoff type B (EUR)	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Information

Afterwards, every type B participant will be informed about the decision his assigned type B participant has made.

Payoffs

At the end of the experiment, one of the four parts will be randomly chosen. The decision in this part will then determine the payoffs of the participants.