The Power of Social Norms – Antagonizing the Bystander Effect in an N-Person Dictator Game

Abstract

This paper investigates, whether the economically modelled bystander effect is antagonized by the effect of social norms on behaviour. Previous research finds group size and social norms to detrimentally affect behaviour. I conduct an experiment that allows to examine the effect of social norms on group size in a multi-dictator dictator game. Dictators are subject to a descriptive norm information before deciding. Effects are identified by comparing average transfers as the fraction of the equal share across treatments. I find no bystander effect, but a positive effect of the social norm. Effects, however, are heterogeneous for gender. The result of this experiment contributes to a better understanding of how behavioural cues influence dictators.

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Content

Introduction

Most economic theory assumes individuals to be fully rational, and apart from maximizing utility in terms of money, this also means that individual are not susceptible to external influences, such as framing or the passage of time. It is also widely recognized that behaviour, nevertheless, is amenable to influence. Various experiments have shown these influences to be numerous and especially diverse in their effect (Camerer, 2003). On one hand, a set of variables such as competitive settings or group size are known to alter individual behaviour to be more rational, i.e. selfishness (Camerer, 2003; Wiesenthal et al., 1983; Luhan et al., 2009; Panchanathan et al., 2013). On the other hand, social cues have been shown to motivate individuals to consider aspects other than personal interest in their behaviour (Shang & Croson, 2009; Krupka & Weber, 2009). However, not much is known about how these forces interact.

In this paper, I examine whether social norms increase donations in a dictator game, when individuals are also subject to a group size effect, which is commonly known as the bystander effect in the field of social psychology (Darley & Latané, 1968).[1] The bystander effect has been attested to be substantial in economic settings by previous research (Fischer et al., 2011). However, I am interested in a slightly different situation as investigated by Panchanathan et al. (2013). Contrary to original bystander studies, Panchanathan et al. (2013) use the dictator game to model a situation in which recipients would benefit from more help and help can be equally contributed by all donors. Dictators in this setting can be understood as individual donors in real life. They know the provision of this good is necessary and that other donors exist, although the other donors have no means to coordinate with them. The effect of a social norm on dictator transfers can then be interpreted as the effect of receiving information on others' behaviour by letter or email. This may introduce a cost-effective way in promoting the supply of public goods (Schultz et al., 2007), such as blood donations.[2] Based on the research presented below I expect group size to erode dictator generosity and social norms to increase dictator generosity. I hypothesise that social norms, thus, counteract the group size effect. The extent to which remains unclear to date, because no attempt has been made to combine both effects. I present some evidence that social norms increase donations in dictator games. Yet, I find heterogenous effects for group size and social norms offering some evidence that effects differ across gender.

The classical experiment to understand generosity in the real world (List, 2007) is the dictator game (Kahneman et al., 1986). It is a variant of the ultimatum game (Güth et al., 1982), designed to control for risk preferences. In the standard dictator game the dictator is endowed with a certain amount of money on which he decides to transfer an arbitrary amount to the recipient, while recipients are endowed with nothing and receive what dictators are willing to share. The rational dictator should keep the endowment. Nevertheless, in laboratory experiments in Western cultures, allocations in anonymous, one-shot games are bimodally distributed, peaking at zero and 50% of the endowment (Fehr & Schmidt, 1999). The equal split is the second most common allocation, hence, average transfers range between 10-30% (Camerer, 2003). Explanations for this non-rational behaviour include altruism, reciprocity, inequality aversion, desire for social esteem and warm glow (ibid.).

[1] The bystander effect is originally defined as the negative relation between group size and the likeliness of receiving help by Darley & Latané (1968). The concept originates from the field of social psychology.

[2] I understand blood donations are incentivized by monetary payment. I merely point out another approach to boosting contributions.

Various experiments have shown that scope for manipulation in dictator games is considerable. Rigdon et al. (2009) conduct an experiment indicating that ex ante social cues increase dictator donations. Generosity increases when subjects felt observed while making decisions. Together with the paper by Krupka & Weber (2013), who show that individuals are generally willing to sacrifice money to reach socially appropriate behaviour, this supports the thesis that altruistic behaviour serves other ends, such as social approval. This is supported by the findings from Krupka & Weber (2009), who discover a pro-social effect of norms on behaviour, which is amplified when individuals observe others to behave accordingly. They also observe that norms are especially effective in guiding individual behaviour when attention is drawn to them (ibid.). These findings have far-reaching consequences. If non-monetary incentives change behaviour, it offers a cost-efficient tool (Schultz et al., 2007) to promote altruism or cooperation, leading to more efficiently allocated resources or higher voluntary contributions to public goods respectively. Shang & Croson (2009) find such an effect. They show social influence increases individual contributions to provide public goods. This suggests behaviour can intrinsically be drawn towards socially desired outcomes. Since social norms signal appropriate behaviour by encapsulating behavioural expectations within a group (Dolan et al., 2010), they represent a powerful tool to manipulate behaviour. Consequently, social norm activation has been discussed as a means in fostering socially desired outcomes (Aarts & Dijksterhuis, 2003; Schultz et al., 2007).

I use social norms to investigate how to counteract the bystander effect. The benefit of social norms is that they are easy to convey and triggering them is inexpensive, because they work without governmental control. Therefore, the use of social norm activation is attractive to government agencies or humanitarian organisations in promoting pro-social outcomes. Allcot et al. (2011), e. g., observe substantial positive effects of social norms on energy saving behaviour (also see Nolan et al., 2008). They use a descriptive social norm by informing households about neighbourhood energy consumption. Schultz et al. (2007) also focus on descriptive norms in discussing social norms management as a cheap and effective way to achieve pro-environmental behaviour. They define descriptive norms as information that provides a reference point for individual behaviour (ibid.). Descriptive norms are easily ascertained by observation, making it beneficial to work with them in economic studies. They give the opportunity to manipulate individual behaviour without deceiving them, while offering a potentially easy and effective approach to trigger pro-social behaviour (Schultz et al., 2007) and increase charitable donations, e.g. increase public goods contributions (Shang & Croson, 2009).

I want to examine the effect of social norms provided as private information, which could be easily adopted by agencies and organisations likely willing to encourage donations such as those observed in the dictator game. Especially considering that their target group is subject to the group size effect, described as the bystander effect, social norms may help to resolve this coordination problem. Individuals in the target group are merely aware that there are others, who may potentially contribute, but can neither observe their behaviour nor coordinate with them. Hence individuals decide about contributing and the size of contribution under uncertainty. A descriptive norm, therefore, helps to resolve this problem by establishing an accepted behaviour potentially decreasing uncertainty.

Based on the presented research I expect descriptive social norms to increase dictator generosity. It would be interesting to see how they interact with a group size effect. To examine the degree to which social norms offset the bystander effect, I suggest an experimental design following Panchanathan et al. (2013). The bystander effect can be modelled in the dictator game by introducing

additional dictators that simultaneously transfer money to a single recipient (Panchanathan et al., 2013). Help is measured by the amount dictators transfer to recipients. The equal share is the amount every dictator must transfer so that welfare is the same for dictators and the recipient in one game. By adding another treatment, where dictators face other dictators as well as a social norm, it is possible to quantify the effect of social norms in the context of group size dynamics. Both effects are revealed by intersession comparison. If average transfers as a portion of the equal share significantly decrease in the multi-dictator compared to the standard dictator game, there is a bystander effect. If transfers under the social norm compared to the multi-dictator game increase, social norms counteract the group size effect. If transfers as the portion of the equal share are lower, as high as, or higher than in the standard dictator game, social norms either have a lower, the same, or a higher influence than the bystander effect.

First, I find no bystander effect for the whole sample. Transfers increase in the bystander treatment, however, not significantly. There is a significant and positive difference between the multi-dictator game and the social norm treatment. Second, I find significant differences when comparing behaviour across gender. While average transfers in the ordinary dictator game do not significantly differ across gender, there are significant differences in behaviour for the multi-dictator session. The bystander effect exists for men and social norms antagonize the bystander effect. However, the bystander effect is inverted for women. Women rather transfer significantly more when another dictator is in the game, but the social norm does not significantly change transfers any further. Women seem to expect other dictators to transfer little and overcompensate regardless of the social norm. Men on the contrary are as susceptible to the diffusion of responsibility (Darley & Latané, 1968) of other dictators in the game as they are to the social norm. I thus present heterogeneous evidence on the bystander effect and the social norm effect in group settings. Note a gender balance in sampling.

This research aligns with findings from Carson & Mui (1997), who show that group decisions significantly and positively differ from individual decisions. Specifically, research from Greitemeyer & Mügge (2015) suggest that the bystander effect only occurs in situations where help of only one person is needed, but rather inverses in situations where victims require help from more than one person. This situation resembles more closely my experimental setup of the group size effect. They investigate a real help situation, and not help in an economic context. Their findings indicate that diffusion of responsibility is a strong explicatory in situations where one helper is needed and that the diffusion of responsibility is not as pronounced in situations where help of more individuals is needed. The similarity of the results, suggests that this may extends to economic situations making group size less of a problem in the contribution to public goods. However, I contribute to the above findings by showing that reactions to group size and social norms significantly differ between gender. This aligns with research done by Kerr (1983). He examines behaviour in social dilemma problems, and finds particularly men decrease contributions to groups, when faced with capable, albeit, free-riding partners. He calls this effect the sucker effect. Laasch & Conaway (2009) explain this with differing social preferences between men and women. They make a case for gender-specific outcomes in the laboratory experiments, which my results support.

The rest of the paper is organised as follows: Section 2 presents my hypotheses. Section 3 explains my experimental design, the statistical tests used and the experimental procedure. Section 4 presents a short data description and the empirical analysis of the impact of the social norm on the bystander effect. Section 5 discusses the results and Section 6 concludes the paper.

1. Hypotheses

Individuals do not only consider personal profit maximisation[3] when making decisions. The importance of other factors in deciding becomes evident when observing endowment shares between 10-30% in the dictator game (Camerer, 2003). Camerer (2003) urges personal motivations termed social preferences as explicatory factors which comprise altruism, reciprocity, inequality aversion, desire for social esteem and warm glow (ibid.). Theoretical models are often based on utility theory using social preferences to explain donations, e.g. the inequity aversion model by Fehr & Schmidt (1999). It should be noted that dictator transfers are typically bimodally distributed (Fehr & Schmidt, 1999), implying that some individuals behave fully rational by giving nothing, while others contribute something, often half of their endowment. However, often more than 60% of the individuals donate a positive share of their endowment to the recipient (Camerer, 2003, 57, table 2.4). The conventional model predicts subjects to transfer something in the dictator game. If this prediction holds, the subjects in my experiment should also transfer a positive amount on average, which I expect to be the case in all conditions[4]. These considerations can be condensed as:

Hypothesis 1: *Dictators transfer on average, a positive amount to the recipient in all three conditions. Transfers will be bimodally distributed in all conditions.*

It is important to note that I am interested in how dictator transfers shift across conditions. Even for bimodal distributions, changes in averages indicate shift directions. I later discuss the adequacy of first moments in analysing U-shaped distributions and the consequences for statistical testing.

Assuming individuals donate on average, I want to investigate how average transfers change when dictators are exposed to two detrimental factors driving behaviour. My experiment is designed to show how these factors affect average transfers by also assessing which factor prevails. In detail, I first investigate the effect of group size on average transfers as a portion of the equal share (the bystander effect). Then I examine how social norms interact with group size.

First, why should the bystander effect affect individual behaviour? Based on a framework presented by Levitt & List (2007), the group size provides a contextual cue. Dictators are informed about additional dictators in the game in their instructions. This changes the properties of the situation (Levitt & List, 2007). The instructions containing information by grouping of dictators, differ from those in the standard dictator game by the group information. The new context under which the decision is taken, either triggers a different set of norms appropriate for the new situation (Levitt & List, 2007) [5] or imposes a momentum of uncertainty about others' behaviour (Darley & Latané, 1968). Irrespective of the underlying mechanism, the literature presented on the bystander effect suggests that average transfers should decrease, establishing a negative relation between group size and transferred amounts. Following the definition and the findings by Panchanathan et al. (2013), I assume the average transfer as a fraction of the equal share (hereafter abbreviated as average shares) decreases as group size increases, but remaining positive. This means, transfers in the group size condition should on average be less generous than in the standard dictator game condition. This can be encapsulated by:

[3] In this paper, profit maximisation is understood to be utility maximisation in terms of money.

[4] The treatments are described in section 3.

[5] Instructions to dictators already invoke expectations. For this reason, experimental instructions should be as neutral as possible.

Hypothesis 2: *When introducing additional dictators to the dictator game, dictator transfers decrease on average compared to dictator transfers in the standard dictator game.*

Note that not all individuals need to be affected in the same way by the group information. It is sufficient when the average individual decreases contributions as a fraction of the equal share. This means that group size does not necessarily shift the distribution of transfers by a constant factor. From this follows another rationale. Since the bystander effect may not affect all individuals equally, I expect both averages and distributions to change. This also holds for changes in hypothesis 3.

Second, do social norms antagonize the bystander effect? Despite the underlying preference driving individual behaviour, numerous experiments have shown social norms substantially influence behaviour (see section 1). Social norms are assumed to trigger expectations of dictators and receivers on appropriate behaviour by representing a behavioural cue (Levitt & List, 2007), thus, impacting social preferences on average. This suggests behaviour can intrinsically be drawn towards socially desired outcomes. After investigating the bystander effect, I am interested in how a descriptive norm changes allocation choices in the bystander effect. Based on findings from the literature presented above, salient and descriptive social norms have the potential to significantly move behaviour towards the reference point they set. The extent of which, however, remains unclear, but can be assessed by comparing average transfers to average transfers in the standard dictator game. I expect average transfers as a fraction of the equal share to increase compared to the bystander condition. Obviously, the social norm antagonizes the bystander effect, if average transfers as a fraction of the equal share do not significantly differ between the standard dictator game and the social norm dictator game. Accordingly, if average shares in this condition are lower/ higher than those in the standard dictator game, the impact of social norms is lower/ higher than the group size effect, respectively. This can be summarized as follows:

Hypothesis 3: *Average dictator transfers are higher when dictators face a descriptive social norm besides the information about additional dictators in the game compared to dictator transfers, when dictators are informed about additional dictators in the game.*

Note that this assumes that subjects in the bystander condition experience the same group size effect as subjects in the social norm condition and that the group size effect in the bystander condition is representative of both subject groups. This, however, we cannot observe. Also, note that average transfers cannot be compared across conditions, as the stake size changes with group size. Only significant changes in the average transfers as a fraction of the equal share (average shares) are relevant for the analysis.

2. Method

2.1 Experimental Design

Below, I present the experimental setup to examine how a descriptive social norm on desired behaviour affects bystander allocations in one-shot dictator games. I adapt the design described by Panchanathan et al. (2013) to reproduce the bystander effect and extend it by a treatment measuring the effect of descriptive social norms on transferred amounts. Particularly, I conduct an experiment consisting of three conditions.

First, I use a standard dictator game as suggested by Kahneman et al. (1986) to constitute a baseline. This is Treatment 1. Each dictator is figuratively endowed with 24 Thalers, of which he can decide to transfer a discrete and arbitrary amount to an anonymous recipient, who is endowed with nothing, but must accept, what the dictator is willing to share. All dictators are anonymous and their

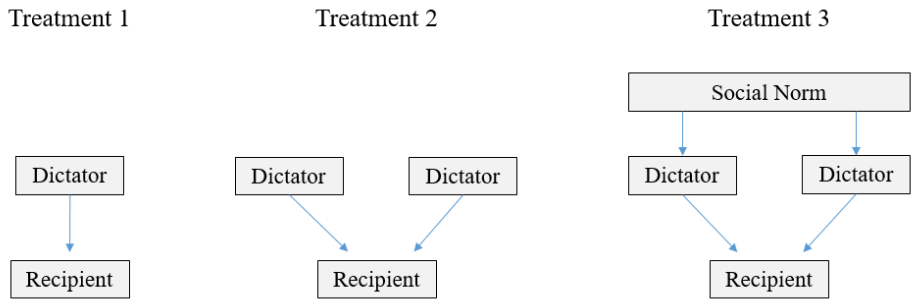

Fig. 1. Experimental design to investigate the effect of social norms on the bystander effect.

decision stays unknown to everyone but themselves.

Second, I use the design from Panchanathan et al. (2013) to investigate how group size affects individual transfers. This is Treatment 2. Consistent with the findings of Panchanathan et al. (2013), which show that transfers decrease most, when going from the one-dictator game to the two-dictator game. Dictators are paired in this treatment, therefore, each game session in this treatment consists of three individuals, two dictators and one recipient. Each Dictator is figuratively endowed with 18 Thalers, of which he can transfer a discrete and arbitrary share to an anonymous recipient. Recipients are endowed with nothing, and receive the sum both dictators in their group transfer. Dictators are made aware of the other dictator in the game, which is the key to modelling a situation in which individuals exhibit the bystander effect. However, dictators are anonymous to each other and are neither informed about the other dictator's decision nor can they agree upon the amounts they transfer in advance.

Third, I take the previously described group-dictator treatment and introduce a descriptive social norm on desired pro-social behaviour, this is Treatment 3. Each game session consists of three individuals, two dictators and one recipient. Dictators are figuratively endowed each with 18 Thalers, while recipients are endowed with nothing. Dictators decide on a discrete, arbitrary amount they want to donate, and recipients must accept the sum of what both dictators transfer. Dictators are made aware of the other dictator in the game, but, as above, receive no further information. Before deciding on the amount transferred, both dictators read the same statement containing the social norm. The social norm states that individuals in Western cultures often choose an even allocation in this type of games (Appendix A.1.2.). This information is taken from Camerer (2003), hence, individuals are not deceived. In fact most individuals who share something give close to 50% of their endowment. The presentation of the social norm makes it salient and should constitute the even split as a reference point.

Endowments are chosen such that, the equal share decreases with group size. Thus, an average welfare of 12 Thalers for each individual (dictators and recipients) can be reached across all treatments. This facilitates later comparisons between treatments. Following Panchanathan et al. (2013), I then define the equal share to be the amount that must be transferred so that welfare is the same for all individuals

(dictators and recipients), which is 12 Thalers for the one-dictator condition and 6 Thalers for the other conditions. I compare dictator transfers as a fraction of the equal share (Panchanathan et al., 2013), which gives the percentage how much of the equal share dictators have transferred in each treatment. The benefit of this is that percentages are the same across conditions (not the amount transferred, which is in absolute terms), and, therefore, are easily comparable to reveal any effects.

I assess the effect of social norms on the bystander effect in two steps. To determine whether social norms antagonize the bystander effect, I first evaluate the bystander effect by comparing average dictator transfers as fraction of the equal share between treatment 1 and 2. If dictator shares decrease on average in Treatment 2, there is a bystander effect. Second, a comparison of average dictator shares between Treatment 2 and 3 reveals the effect of the social norm on the bystander effect. If shares increase on average in Treatment 3, social norms counteract the group size effect. If shares in Treatment 3 are on average higher than in Treatment 1, the positive impact of social norms on behaviour outweighs the negative impact of group size.

To ensure the significance of the results, tests must allow for non-normal distributions. Usually non-parametric tests are used. I will use a Wilcoxon-Test to test if parameters are significantly larger or smaller than the reference value. It should be noted that non-parametric tests test for a significant parallel shift of the distribution, which do not have to be normal, but of the same variance. I will test for equality of variance. Nonetheless, I will also use permutation tests to see if results coincide. Permutation tests have the benefit of first estimating the distribution and then to test for significant mean differences.

2.2 Procedure

The experiments were conducted in a laboratory set up in a computer pool of the university of Passau in June 2016. The experimental interface was programmed by the software ztree, the Zurich Toolbox for Readymade Economic Experiments (Fischbacher, 2007). Experiments were scheduled for 30 minutes to fit in-between lectures and different experiments were paired to optimally use subject pools and available time. Experiments were combined in a manner to ensure the least possible influence across experiments. The experiment I suggest, was estimated to take 5 minutes per run, and, therefore, was combined with an experiment on how self-control depletion affects individual preferences, which took 20 minutes to complete. The sequence of experiments alternated to counteract potential sequencing effects.

The subjects are German students at the University of Passau who are enrolled in different majors and different degrees. The university offers mainly study programmes in the social and humanitarian sciences, which is largely reflected in the sample. Subjects were asked by experimenters if they want to participate in the experiment, when passing the business school. Experimenters asked as many individuals as possible in a somewhat randomly fashion. To avoid biases caused by misunderstanding the instructions, students were only chosen to participate when they were capable of understanding German. Subjects were pitched on the experiment beforehand and asked whether they had already participated in this experiment. Even though, there was no control to prevent students from participating twice, except for experimenters' capability of remembering faces, individuals did not seem prone to retaking an experiment. Once students agreed to participate, they were offered coffee, sweets and fruits to take before and after experiments. However, subjects could not be paid in terms of money.

For the experiment, I collected observations on a total of 195 students within two consecutive days. I ran 11 sessions with at least 12 and no more than 21 participants. Although the first run contained 12 observations, it contributed only 9, because 4 invalid observations were dropped before the analysis. The invalid observation occurred through a programming mistake. Subject count was chosen to be a multiple of three, so that participants were equally assigned to all treatment in every session. That implies that I used a between-participant design, which is unproblematic if individuals do not systematically differ across treatments. This should not be the case, since individuals were randomly assigned to treatments and all treatments were tested in each session. The latter also implies that biasing factors affect all treatments at least in the same way. There is no convincing argument, why one of the treatments should be disproportionally more affected by these than any of the other treatments.

The experiment was conducted the same way in all sessions. First, participants were seated at separated computers by randomly drawing a terminal number when entering the room. Each terminal was separated by a partition wall to ensure that decisions could be taken anonymously. The dictators are instructed to sit, while remaining silent. Once subjects were seated, the experimenter read out loud the general instructions (Appendix A.1.1.). Subjects were informed that their decisions were anonymous and asked to decide as if they had been given money. This is only second best to endowing participants with real money, however, to point out that decisions should be taken under the impression of owning the money, may partly induce desired preferences. This is a limitation to the experiment, because individuals probably decide more generous than they would if they were endowed with money. The observed data supports this (see Fig.2). Furthermore, due to technical conditions when running the experiment and to attend to questions and problems, the experimenters were present in the same room with subjects. However, since it affects all treatments equally this should not be a problem. This is also true for other influences, e.g. the method chosen to endow dictators (by experimenter or by earning the endowment), or the expectations triggered by the instructions (Levitt & List, 2007).

After reading out the general instructions, the experiments start with experiment specific instructions on the computer screens. Individuals read instructions assigning them to the dictator role in the different treatments. These instructions were identical for all groups, and only differed in the group context and the group context with social norm (Appendix A.1.2.). Due to resource restrictions and to collect enough data on a representative sample, all individuals were made to decide as dictators. Actual roles were intended to be drawn by lot after the sessions as well as to link payoffs to the selected role. This fell short, because there was no payoff scheme. Group dictators were paired. The instructions clearly stated that dictators' behaviour is unobservable and decisions on the allocation cannot be traced to the individual. Dictators were told their endowment and that they can share an arbitrary, discrete amount of their endowment, explicitly indicating that this means all, zero, or a part of their endowment. Individuals in Treatment 2 were informed about the other dictator in the game, and that they will not receive any other information about him than about his existence. If individuals were in Treatment 3, they were not just informed about the other dictator, but also about the social norm.

Individuals were then asked to decide how much they want to share, by entering an integer in the box. After the choice was submitted, individuals were informed about their payoff. Dictators are then forwarded to fill out a questionnaire collecting general information on the subjects, such as gender, age, major and degree. The experiment is then ended and either leave or continue to the

cooperation experiment. On leaving participants are encouraged to take sweets, and fruits, and coffee, if they wish.

3. Results

In this section I examine the impact of groups size and the social norm on average dictator transfers as a fraction of the equal share. First, I describe a few sample properties. Second, I present the analysis, stating that there is no bystander effect, but a positive effect of social norms on average transferred amounts. Then, I contextualize these findings. Third, I examine dictator transfers broken down by gender, and find heterogeneous effects for female and male participants.

The descriptive statistics are reported in table 1 (Appendix B.1.). Overall 191 students participated in my experiment. Students were on average 22 years old across all treatments, the youngest being 17 and 18, respectively, and the oldest participants in all treatments were between 30 and 34 years old. 57% of participants were women, and this is almost also the female quota in each treatment. In all treatments, the equal split is the mode (Fig.2), and zero transfers to recipients are the

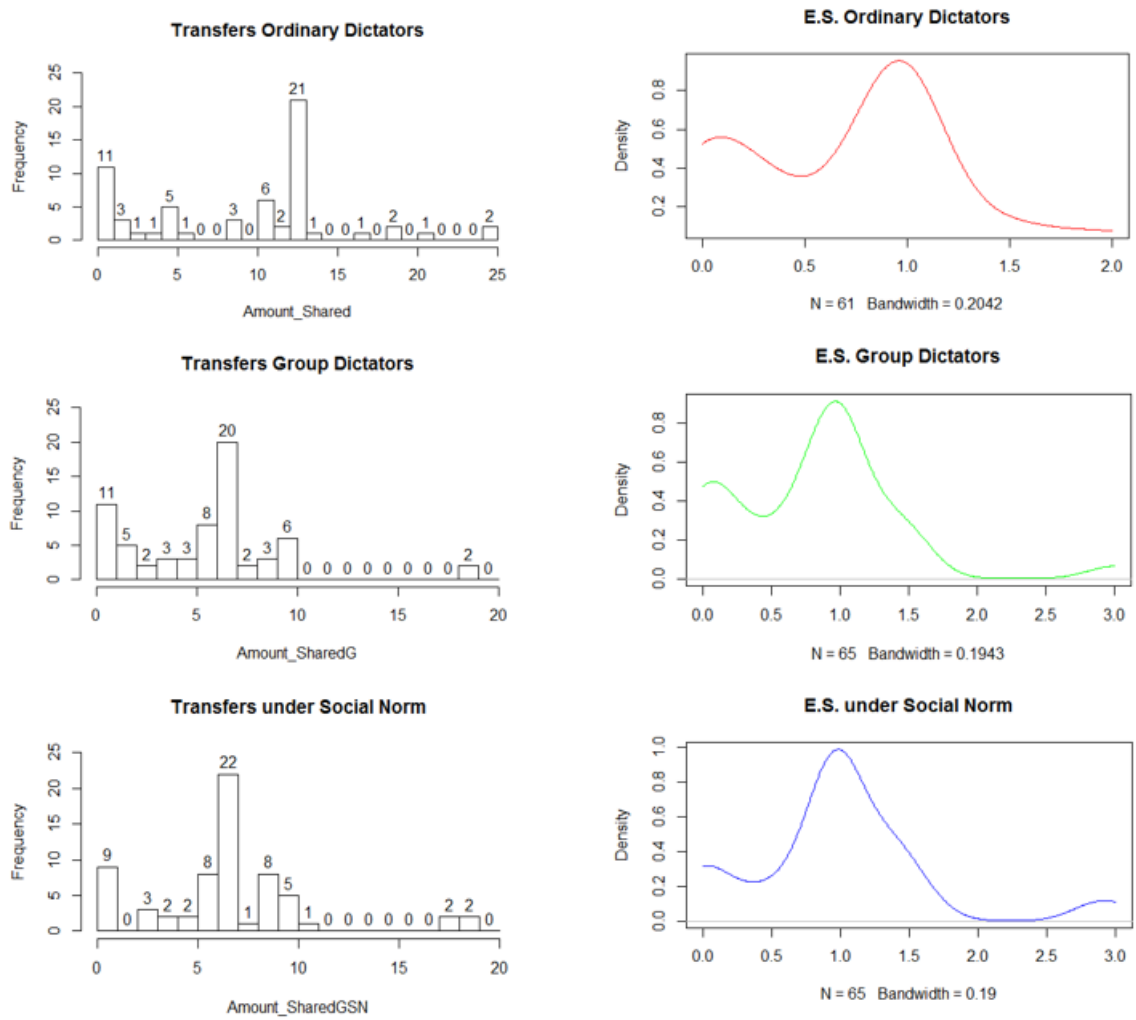

Fig.2: Dictator transfers by treatment. Transfers Ordinary Dictators are transfers in treatment 1, transfers Group Dictators are transfer in Treatment 2, and transfers under social norm are transfers in treatment 3. Left: The amount dictators transferred are given in absolute values. Right: Kernel density plot with dictator transfers given as the share of the equal share (E.S.). Estimation used gaussian kernel.

second most frequent allocation choice. This constitutes the familiar U- or J-shaped dictator game distribution. In all treatments a few subjects transferred everything. Since the literature states that in Western cultures anonymous transfers in standard dictator games are usually not more than 50% of dictator endowment, it can be presumed that individuals may not have understood the game. These observations are, nonetheless, in the analysis, because the underlying motivation of donating all their endowment is unclear, and it could also be that the lack of earning the endowment is responsible for this result. Setting the outliers apart for a moment, there is an interesting change in the distributions in Fig.2. While the distribution in the standard dictator game looks very clearly bimodal, dispersion in Treatment 2 somewhat decreases (exempting upper bound outliers). The distribution in Treatment 2 looks more centred around the mode. There is still a J-shape, but considerable contributions close to, and higher than the equal share. This is more connoted in Treatment 3. The distribution looks approximative normal, except for the zero share observations. A considerable amount of contributions is higher than the equal share, and transfers centre even more around the mode than in Treatment 2. Apparently, some individuals transfer more than the equal share, but notably, some individuals already do so in the bystander condition. I examine this fact further below.

As reported in table 1, dictators transferred on average a positive amount in all treatments (compared to nothing), which complies with hypothesis 1. Individuals in Treatment 1 transferred on average 8.59 Thalers, that is 72% of the equal share. Individuals in Treatment 2 transferred on average 4.89 Thalers, which is 82% of the equal share; and individuals in Treatment 3 transferred on average 5.97 Thalers, 99.5% of the equal share. Average transfers as a fraction of the equal share are stated in table 2. Values were tested to be smaller or bigger than the respective value from the comparison treatment. Surprisingly, shares in Treatment 2 did not decrease, but rather increased, however, not significantly. Since there is no significant change in contributions between Treatment 1 and Treatment 2, the results do not support the bystander effect as postulated in hypothesis 2. This finding contrast the results from Panchanathan et al. (2013), who present evidence in favour of a bystander effect. I will discuss reasons for the missing bystander effect in section 5. Since the group size effect is absent, an assessment of the effect of social norms on the bystander effect is obsolete. This complicates the evaluation of hypothesis 3. The group information has no impact, but dictator transfers are highest in Treatment 3. Transferred amounts as a portion of the equal share are significantly higher in Treatment 3 than shares in Treatment 2 and 1. However, the effect of social norms on the bystander effect cannot be investigated, which is what the treatment is designed for. Since transfer shares increase by 10 percentage points, social norms should only explain a part of the total increase in dictator transfers. The additional group information could theoretically cause interaction effects, which would be unobserved. Below, however, I will point out that the 10-percentage point increase is more likely driven by higher female contributions in Treatment 2. For this reason, the findings partially support hypothesis 3. The social norms can be interpreted to positively impact individual generosity in this specific setting, but the counterfactual misses, therefore, the size of the impact cannot be quantified. It is worth noting that average transfers in treatment 3 are very close to the equal share. Since the equal share is the amount that must be given up, so that welfare is equal for all individuals, aggregate welfare is maximal[6] in the social norm treatment. This indicates that social norms offer a possible cost-effective means to reach welfare superior outcomes.

Finding that there is no bystander effect, I scrutinize, if treatment effects differ by surveyed characteristics (Appendix A.2.). Even though, a considerable amount of observations was acquired,

[6] I assume standard, that is concave, preferences.

collected data is insufficient to detect effects by treatment[7] for major (8 categories) or degree (5 categories).[8] Interestingly, there are significant treatment effects, when examining transfer shares by gender. Male participants were less generous, giving on average 69% of the equal share compared to females, who donated on average 96% (table 3, Appendix B.1.). The overall gender difference is significantly different from zero. Most notable, however, are the differences by treatment. Table 2 reports average transfer shares as fraction of the equal share for each treatment by gender. Males transferred on average 75% of the equal share in the standard dictator game, 50% in treatment 2, and 83% in treatment 3. Females transferred in treatment 1 less than males, only 69% of the equal share, but 107% of the equal share in treatment 2 and 112% in treatment 3. Absolute transfers by gender are reported in table 3 (Appendix B.1.). Conforming with hypothesis 1, individuals shared in all treatment groups a positive amount on average.

Table 2: Average dictator transfers as a share of the equal share overall and by gender

	Average transfers as a fraction of the equal share N° Observations		
	(1)	(2)	(3)
All	0.7158 61	0.8154 65	0.9949* 65
Male	0.7532 26	0.5* 29	0.83* 28
Female	0.6881 35	1.069*† 36	1.1171† 37

Tab.2: Average transfers as share of the equal share for each treatment, overall and by gender. Stars indicate significance on the 10% level at least. Hypotheses tested, whether the value left of a value in this table is greater or smaller than the respective value. Crosses indicate significance on the 10% level at least. Hypotheses tested, whether the value above a value in this table is greater or smaller than the respective value. Crosses only compare averages in the gender case. I used the Wilcoxon-Test, but results are robust to testing with permutation tests

First, male transfers conform with hypothesis 2 and 3 in section 2. The transferred amount as a fraction of the equal share in treatment 2 is significantly smaller than in treatment 1. This is the bystander effect. The transfer distribution of treatment 2 shifts left compared to the transfer distribution in treatment 1 (Fig.2), and permutation tests support both distributions to significantly differ from each other. Male transfers are significantly higher in treatment 3 compared to treatment 2, enabling to assess the effect on the social norm on the bystander effect, as hypothesised in hypothesis 3. First, males transfer significantly more under social norm than in the group size treatment, which means that social norms counteract the bystander effect. Second, transfers in treatment 3 are higher than in treatment 1, but not significantly. From these findings, I deduce that social norms antagonize, and potentially outweigh[9] the bystander effect for men.

Third, female behaviour drives the overall effects in treatment 2. Female participants transfer on average a lower, but not significantly lower, fraction of the equal share in the baseline treatment

[7] N is low, when treatments are itemised by several categories, therefore, the variance is too high to detect significant effects for these categories.
[8] Further data on majors, degrees, and retake are provided on request.
[9] This can only be examined with a larger data set.

than respective males. Note, this implies that females and males do not generally differ in their contributions, meaning that females are not more generous overall. Females rather react differently to the behavioural cues in treatment 2 and 3. Remarkable are female transfers in treatment 2 (table 2). The average shared amount is significantly higher in treatment 2 than in treatment 1, contrasting hypothesis 2. The average transfer in treatment 2 is a positive, not a negative function of group size. Females transferred on average more than 100% of the equal share, indicating that the observed transfers in treatment 2 in figure 2, which are clustering closely right of the equal share, are mainly female contributions. I suspect that female transfers are responsible for driving up overall average shares in treatment 2, by overcompensating male behaviour. Female shares increase by roughly 38 percentage points compared to a decrease in male contributions by roughly 25 percentage points. This suggests that the observed average shares are representative.[10] There are two possible mechanisms for the observed female behaviour.[11] Females either expect others to give little and overcompensate, or females expect others to give much and, therefore, contribute much. I discuss this in section 5.

Fourth, the social norm has no significant effect on female behaviour in treatment 3. Although, female shares increase in treatment 3 compared to treatment 2, the social norm does not significantly increase contributions further. Since donations are already close to the equal share in treatment 2, an increase would not be desirable. As explained above, aggregate welfare is maximal for an even resource allocation, and decreases as allocations grow more unequal. However, it is interesting to note that females experience a positive group size effect, but no effect of the social norm. This not just implies that group information has opposing effects on men and women, but also that the overall observed social norm effect, consists of the social norm influence on men, and the positive group size influence on women. I conclude that the increase in overall transfers from treatment 2 to 3 is largely driven by the social norm influence on men, while the overall welfare in treatment 3 comes at the expense of women, because female transfers in treatment 3 are significantly larger than male transfers. Thus, group size and social norms have heterogeneous effects on gender.

4. Discussion

Although, the experiment conveys interesting results, using laboratory experiments raises some concerns about external validity. The controlled environment in a laboratory has the benefit of delivering internally valid results. The possibility of generalising the results remains unclear, since only students were tested, and participants could not be endowed with real money. Students are the favourite subject pools in conducted experiments, but they are not representative for the respective population. Average behaviour was quite generous, with having observations where individuals transferred everything. In the absence of real monetary endowment, results may have been less generous, if individuals had to earn their imaginary endowment beforehand, which is more common in reality. Cherry et al. (2002) find individuals to behave more selfishly, if the initial endowment was earned. Thus, subjects in dictator games relate differently to earned money compared to money endowed from an authoritative figure (the experimenter). This is a useful consideration for further experiment. It remains questionable, if this explains the missing overall bystander effect.

[10] Since there are 26 male observations in treatment 2, this assumption is debatable. It remains to further research to examine, if and to what extent more male observations affect average male transfers.

[11] I assume that most subjects understood the game and correctly computed the equal share of the game. Therefore, transfers above the equal share are intrinsically motivated, and are not the outcome of limited computation.

Contrary to the situation modelled by Darley & Latané (1968), Panchanathan et al. (2013) they construct the group size treatment as a situation, where help can be partitioned. In fact, my results match research in the field of social psychology on the bystander effect in situations, where victims require help from more than one person. Greitemeyer & Mügge (2015) show a reversed bystander effect in these situations, albeit, these are emergency situations. I conclude from my results that the construction of the helping situation by Panchanathan et al. (20013) resembles more closely the one chosen by Greitemeyer & Mügge (2015). Although, Panchanathan et al. (2013) examine the group size effect in an economic situation and the literature overview suggest the bystander effect to be more pronounced in an economic context (Fischer et al., 2011), the mere fact that victims need and benefit from more help, seems to make a difference for individuals. This makes sense, when considering the reasons for lack of help in the Darley & Latané (1968) experiment. While they state that individuals were uncertain about the behaviour of others, the experimental design by Panchanathan et al. (1968) and Greitemeyer & Mügge (2015) reduces this uncertainty. Since recipients/ victims need more help, they will be better off, independent of the behaviour of others. It is debatable, if this effect is as pronounced in non-emergency as in emergency situations, but my findings give some evidence in favour of the above mechanism. In the context of public goods provision, this indicates that individuals are apparently willing to contribute in general for some intrinsic reason and without state interference, making group size less of a problem in the contribution to public goods. It would be interesting to see if the experimental design could be changed to better reflect the original bystander situation. However, the relevance for economic theory is rather ambiguous.

Nonetheless, I find significant heterogeneous effects for male and female participants, showing that males experience the hypothesised effects (hypothesis 2 and 3), whereas females exhibit a positive group size effect, but are unaffected by the social norm. This rather curious result nicely aligns with findings from Kerr (1983), who demonstrates men to contribute little in social dilemma problems, when paired with capable, but free-riding partners. Whereas, Aguiar et al. (2009) examine expectations on gender specific generosity in the dictator game, and find substantial differences in male and female believes. They show that women assume other women to be more generous, while men suppose others behave like themselves. This suggests the following mechanism in explaining female behaviour in my experiment: female participants give more, because they believe other female participants give more. This is contrasted by a female quota below 60%, which suggests a roughly even gender allocation in the experiment.

This study provides evidence that there is an immediate effect of non-monetary incentives, the social norm, on economic transactions, constituting a cost-efficient means in altering behaviour, by promoting altruism or cooperation. This could potentially lead to more efficient allocations. Yet, the longevity of the social norm effect on the size of dictator transfers is questionable. Masclet et al. (2003) examine the endurance of non-monetary and monetary punishment. They discover non-monetary incentives to have a stronger immediate impact, but monetary punishment is more efficient in the long run. In this respect, it may be worthwhile investigating if the social norm effect lasts in a repeated dictator game, when the norm has been shown once at the beginning.

5. Conclusion

Previous studies have described the different factors influencing individual behaviour (Camerer 2003), while no attempt has been made to estimate the degree of interaction. It is evident that analysing the predominance of contrary influences on individual behaviour holds further insight for behavioural

economics. First, it discloses potential counter-measures to socially unwanted behaviour in general, and second, it contributes to a better understanding of individual behaviour, when individuals are subject to multiple influencing factors. This is relevant when predicting outcomes depend on behaviour.

The results of the experiment add insight to the literature on the influences driving individual generosity, particularly how social norms affect behaviour, by using a very simple experimental design. The experimental layout consists of three different dictator games. To model the bystander effect, I follow the design Panchanathan et al. (2013) propose. They introduce additional dictators to a dictator game that simultaneously transfer an arbitrary share of their endowment to a single recipient and compare these transfers to the transfers in an ordinary dictator game (Kahneman et al. 1986). Accordingly, I propose an ordinary dictator game session, a session with two dictators and a session which extends the two-dictator session by a descriptive social norm statement, informing dictators that the equal share is an allocation often chosen in ordinary dictator games (Camerer 2003). Group size and social norm effects are identified, by comparing average transfers across treatments. The experiment is constructed to increase recipients' welfare with the amount of help received. Help is measured by the amount dictators transfer, while, at the same time, help can be partitioned between dictators.

I show a positive overall effect on social norms in a group setting on charitable donations. This insight could be important to humanitarian organisations and state agencies alike, by providing a cost-effective means to trigger pro-social behaviour. This study contributes to the existing research by showingto what extent detrimental influences on behaviour interact, and by further eliciting gender-specific influences. I especially contribute by showing a heterogeneous effect for gender. First, I find no bystander effect for the whole sample, but social norms have a positive and significant effect on generosity. Second, treatments affect female and male participants significantly differently. Male participants are susceptible to both, the bystander effect and the social norm effect, whereby the social norm effect antagonizes the bystander effect. Female participants, however, exhibit a positive group size effect, but are unaffected by the social norm. The underlying reasons for this differing behaviour could be the subject of further research. Female behaviour seems to be the driving force behind the overall insignificant effect of group size, by counteracting lower male transfers. Whereas, the positive reaction of men to the social norms, seems to drive the social norm effect. Note that women and men do not differ in the standard dictator game contributions, and that women transfer on average almost the size of the equal share in the group size and the social norm treatment. While male contributions are not as high. The social norm treatment maximises aggregated welfare, since average transfers are close to the equal share, however, at the expense of women.

In conclusion, the experiment offers valuable insight in dictator transfers, when individuals are subject to different behavioural influences. I show that social norms can considerably contribute to welfare, by enhancing equal resource allocations. This is especially relevant for charitable organisations.

Strokes: 51.153

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Appendix A

A.1. Instructions

The original instructions are in German, a translation into English can be received from the author upon request.

A.1.1. General instructions

Herzlich Willkommen! Vielen Dank für Ihre Bereitschaft, an zwei kurzen Experimenten teilzunehmen. Bevor das erste Experiment startet, einige allgemeine Erläuterungen vorab: Mit den Experimenten wollen wir Erkenntnisse über menschliches Verhalten gewinnen. Die Teilnehmer an den Experimenten befinden sich alle hier im Raum und nehmen an denselben Experimenten teil. Alle Teilnehmer sind anonym und können sich nicht untereinander absprechen. Auch Ihre Entscheidungen und Angaben werden anonym ausgewertet. Bitte verhalten Sie sich während der Experimente ruhig und sprechen Sie nicht mit Ihrem Nachbarn. Beachten Sie, dass es während der Experimente zu Wartezeiten kommen kann. Haben Sie einen Bildschirm einmal verlassen, kann dieser nicht erneut aufgerufen werden. Die erzielten Gewinne können leider nicht ausbezahlt werden. Versuchen Sie dennoch sich vorzustellen und sich so zu verhalten, als würde um echtes Geld gespielt werden. Auf der folgenden Seite wird der Ablauf des ersten Experimentes erklärt. Bitte lesen Sie die Anleitung sorgfältig durch und heben Sie Ihre Hand im Falle noch offener Fragen. Ein Spielleiter kommt dann zu Ihnen. Sie können jetzt mit dem ersten Experiment beginnen: Klicken Sie dazu auf 'Experiment starten'.

A.1.2. Written instructions on computer screens

i. Welcome Screen

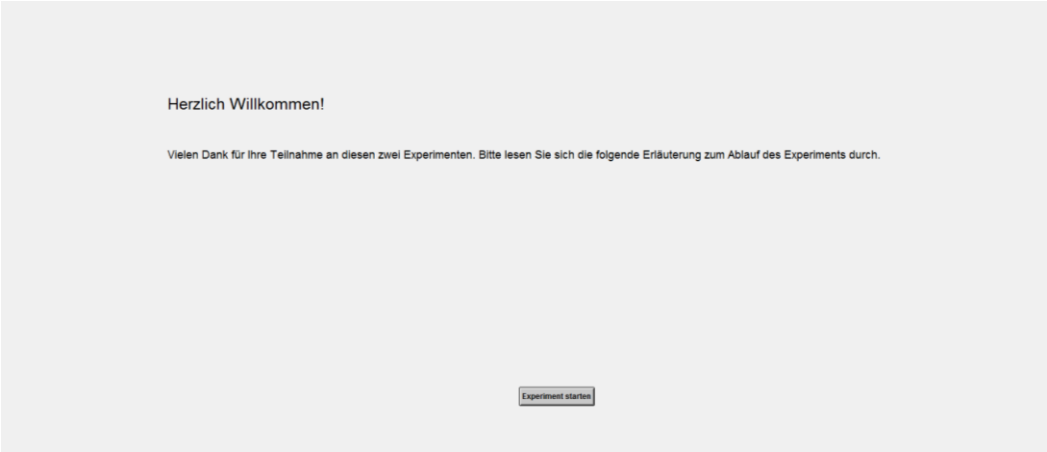
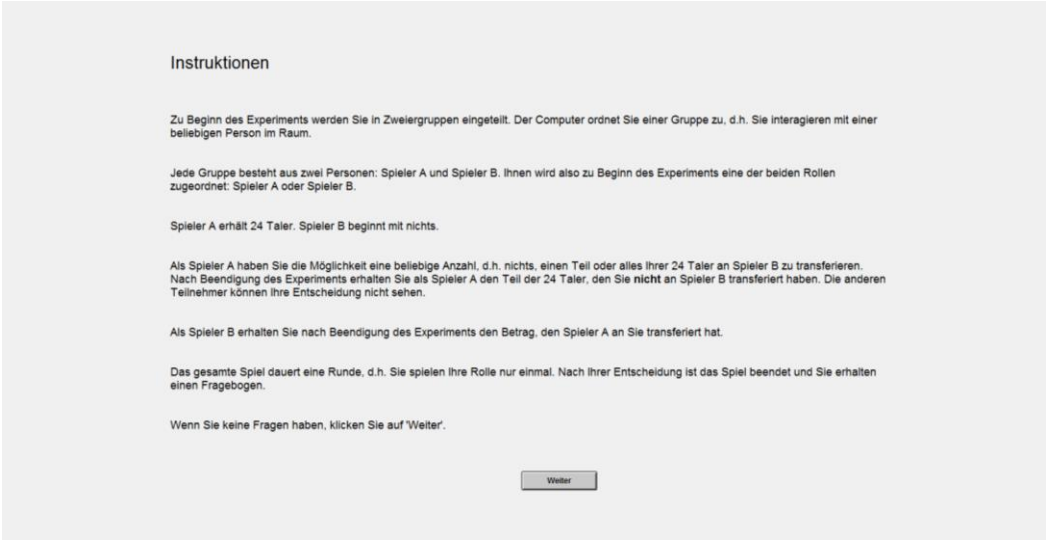


Fig.3. Welcome screen. It’s the same for all treatments.

ii. Game Instructions

First come the instructions for the standard dictator game.



Instruktionen

Zu Beginn des Experiments werden Sie in Zweiergruppen eingeteilt. Der Computer ordnet Sie einer Gruppe zu, d.h. Sie interagieren mit einer beliebigen Person im Raum.

Jede Gruppe besteht aus zwei Personen: Spieler A und Spieler B. Ihnen wird also zu Beginn des Experiments eine der beiden Rollen zugeordnet: Spieler A oder Spieler B.

Spieler A erhält 24 Taler. Spieler B beginnt mit nichts.

Als Spieler A haben Sie die Möglichkeit eine beliebige Anzahl, d.h. nichts, einen Teil oder alles Ihrer 24 Taler an Spieler B zu transferieren. Nach Beendigung des Experiments erhalten Sie als Spieler A den Teil der 24 Taler, den Sie **nicht** an Spieler B transferiert haben. Die anderen Teilnehmer können Ihre Entscheidung nicht sehen.

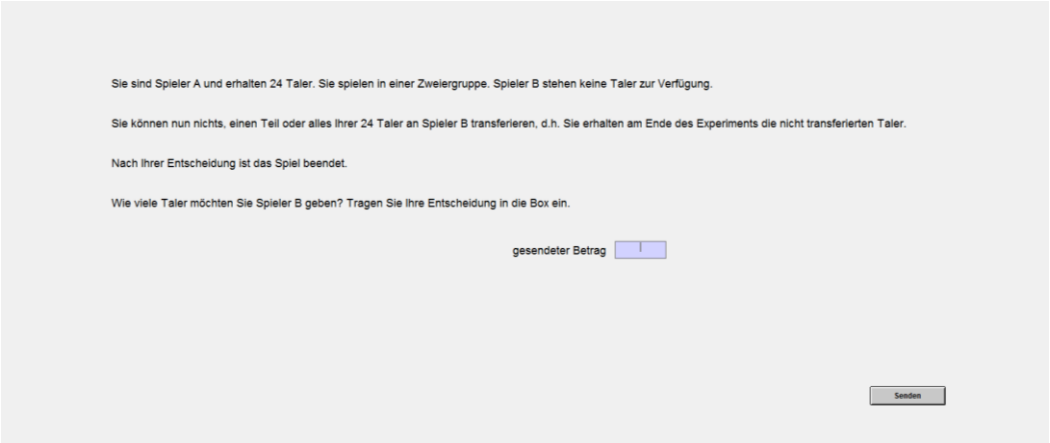
Als Spieler B erhalten Sie nach Beendigung des Experiments den Betrag, den Spieler A an Sie transferiert hat.

Das gesamte Spiel dauert eine Runde, d.h. Sie spielen Ihre Rolle nur einmal. Nach Ihrer Entscheidung ist das Spiel beendet und Sie erhalten einen Fragebogen.

Wenn Sie keine Fragen haben, klicken Sie auf 'Weiter'.

Weiter

Fig. 4: General instructions for the standard dictator game.



Sie sind Spieler A und erhalten 24 Taler. Sie spielen in einer Zweiergruppe. Spieler B stehen keine Taler zur Verfügung.

Sie können nun nichts, einen Teil oder alles Ihrer 24 Taler an Spieler B transferieren, d.h. Sie erhalten am Ende des Experiments die nicht transferierten Taler.

Nach Ihrer Entscheidung ist das Spiel beendet.

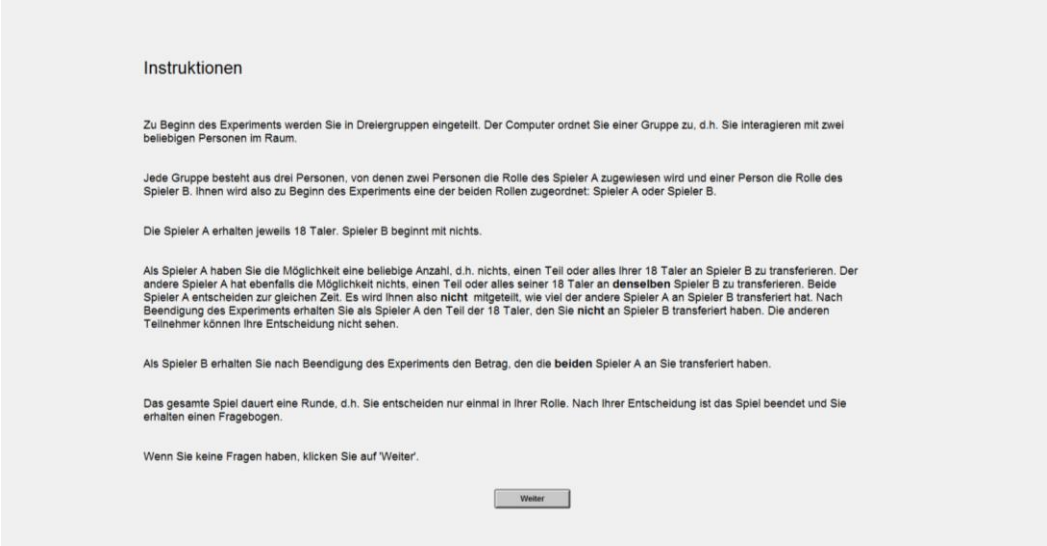
Wie viele Taler möchten Sie Spieler B geben? Tragen Sie Ihre Entscheidung in die Box ein.

gesendeter Betrag

Senden

Fig. 5: Specific instructions for the standard dictator game.

The following instructions are those for the group dictator treatment. The general instructions are the same for Treatment 2 and Treatment 3.



Instruktionen

Zu Beginn des Experiments werden Sie in Dreiergruppen eingeteilt. Der Computer ordnet Sie einer Gruppe zu, d.h. Sie interagieren mit zwei beliebigen Personen im Raum.

Jede Gruppe besteht aus drei Personen, von denen zwei Personen die Rolle des Spieler A zugewiesen wird und einer Person die Rolle des Spieler B. Ihnen wird also zu Beginn des Experiments eine der beiden Rollen zugeordnet: Spieler A oder Spieler B.

Die Spieler A erhalten jeweils 18 Taler. Spieler B beginnt mit nichts.

Als Spieler A haben Sie die Möglichkeit eine beliebige Anzahl, d.h. nichts, einen Teil oder alles Ihrer 18 Taler an Spieler B zu transferieren. Der andere Spieler A hat ebenfalls die Möglichkeit nichts, einen Teil oder alles seiner 18 Taler an **denselben** Spieler B zu transferieren. Beide Spieler A entscheiden zur gleichen Zeit. Es wird Ihnen also **nicht** mitgeteilt, wie viel der andere Spieler A an Spieler B transferiert hat. Nach Beendigung des Experiments erhalten Sie als Spieler A den Teil der 18 Taler, den Sie **nicht** an Spieler B transferiert haben. Die anderen Teilnehmer können Ihre Entscheidung nicht sehen.

Als Spieler B erhalten Sie nach Beendigung des Experiments den Betrag, den die **beiden** Spieler A an Sie transferiert haben.

Das gesamte Spiel dauert eine Runde, d.h. Sie entscheiden nur einmal in Ihrer Rolle. Nach Ihrer Entscheidung ist das Spiel beendet und Sie erhalten einen Fragebogen.

Wenn Sie keine Fragen haben, klicken Sie auf 'Weiter'.

Weiter

Fig. 6: General instructions for Treatment 2 and 3.

Sie sind Spieler A und erhalten 18 Taler. Sie spielen in einer Dreiergruppe, d.h. der zweite Spieler A erhält ebenfalls 18 Taler. Spieler B stehen keine Taler zur Verfügung.

Sie können nun nichts, einen Teil oder alles Ihrer 18 Taler an Spieler B transferieren. Der andere Spieler A kann ebenfalls nichts, einen Teil oder alles seiner 18 Taler an **denselben** Spieler B transferieren. Es wird Ihnen jedoch **nicht** mitgeteilt, wie sich der andere Spieler A entschieden hat. Sie erhalten am Ende des Experiments den nicht transferierten Teil Ihrer 18 Taler.

Spieler B erhält die Summe an Talern, die Sie **und** der andere Spieler A transferieren.

Wie viele Taler möchten Sie Spieler B geben? Tragen Sie Ihre Entscheidung in die Box ein.

gesendeter Betrag

Senden

Fig. 7: Specific instructions for Treatment 2.

Sie sind Spieler A und erhalten 18 Taler. Sie spielen in einer Dreiergruppe, d.h. der zweite Spieler A erhält ebenfalls 18 Taler. Spieler B stehen keine Taler zur Verfügung.

Sie können nun nichts, einen Teil oder alles Ihrer 18 Taler an Spieler B transferieren. Der andere Spieler A kann ebenfalls nichts, einen Teil oder alles seiner 18 Taler an **denselben** Spieler B transferieren. Es wird Ihnen jedoch **nicht** mitgeteilt, wie sich der andere Spieler A entschieden hat. Sie erhalten am Ende des Experiments den nicht transferierten Teil Ihrer 18 Taler.

Spieler B erhält die Summe an Talern, die Sie **und** der andere Spieler A transferieren.

In westlichen Kulturen wählen Spieler oft eine gleichmäßige Aufteilung.

Wie viele Taler möchten Sie Spieler B geben? Tragen Sie Ihre Entscheidung in die Box ein.

gesendeter Betrag

Senden

Fig. 8: Specific instructions for Treatment 3.

A.2. Questionnaire

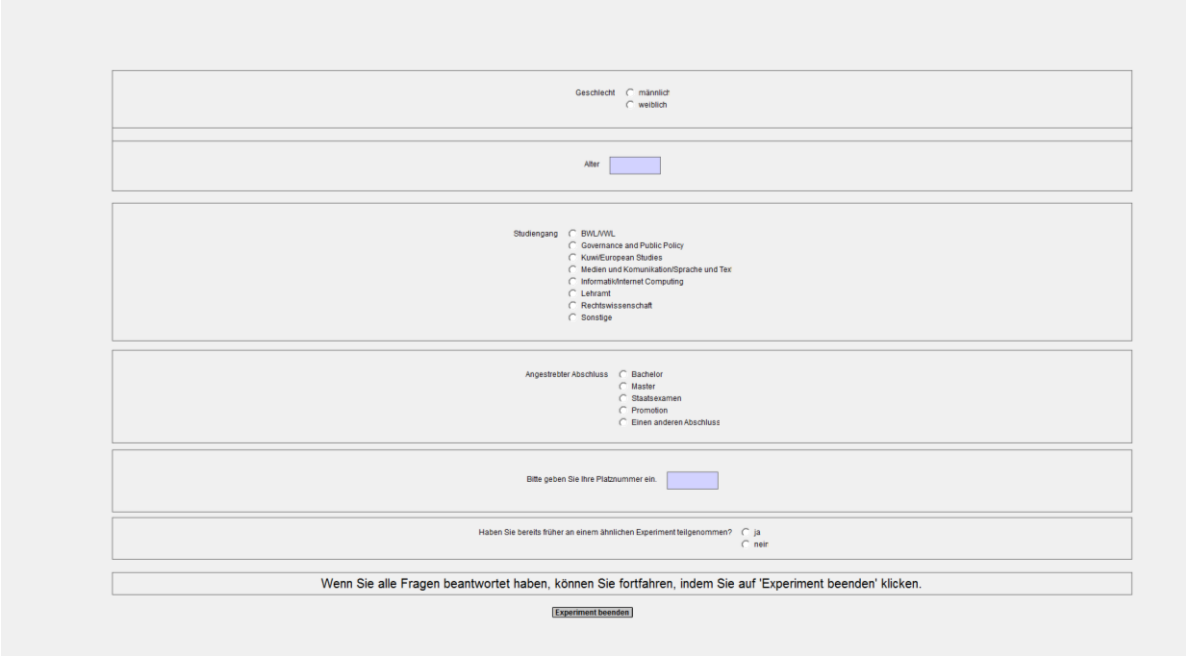


Fig. 9: Questionnaire must be filled out at the end of the game by all participants across all treatments. Questionnaire raised descriptive information.

Appendix B

B.1. Descriptive Statistics

Table 1. Descriptive statistics by type

```
$`1`
                 vars  n  mean   sd median trimmed  mad min max range  skew kurtosis   se
Amount_Shared       1 61  8.59 6.20  10.00    8.24 2.97   0  24    24  0.18    -0.48 0.79
Type                2 61  1.00 0.00   1.00    1.00 0.00   1   1     0   NaN      NaN 0.00
sex                 3 61  1.57 0.50   2.00    1.59 0.00   1   2     1 -0.29    -1.95 0.06
age                 4 61 22.31 2.92  22.00   22.04 2.97  18  34    16  1.17     2.43 0.37
Share.E.S.Dictator  5 61  0.72 0.52   0.83    0.69 0.25   0   2     2  0.18    -0.48 0.07

$`2`
                 vars  n  mean   sd median trimmed  mad min max range  skew kurtosis   se
Amount_Shared       1 65  4.89 3.70      6    4.64 2.97   0  18    18  1.03     2.64 0.46
Type                2 65  2.00 0.00      2    2.00 0.00   2   2     0   NaN      NaN 0.00
sex                 3 65  1.55 0.50      2    1.57 0.00   1   2     1 -0.21    -1.99 0.06
age                 4 65 22.22 3.02     22   21.94 2.97  18  30    12  0.73    -0.30 0.37
Share.E.S.Dictator  5 65  0.82 0.62      1    0.77 0.49   0   3     3  1.03     2.64 0.08

$`3`
                 vars  n  mean   sd median trimmed  mad min max range  skew kurtosis   se
Amount_Shared       1 65  5.97 4.01      6    5.64 2.97   0  18    18  1.02     2.03 0.50
Type                2 65  3.00 0.00      3    3.00 0.00   3   3     0   NaN      NaN 0.00
sex                 3 65  1.57 0.50      2    1.58 0.00   1   2     1 -0.27    -1.95 0.06
age                 4 65 22.35 2.79     22   22.25 2.97  17  31    14  0.42    -0.09 0.35
Share.E.S.Dictator  5 65  0.99 0.67      1    0.94 0.49   0   3     3  1.02     2.03 0.08
```

Tab. 1: Descriptive statistics by Type. `$`1` is the statistic for Treatment 1, `$`2` is the statistic for Treatment 2, `$`3` is the statistic for Treatment 3.

Table 3. Descriptive statistics by Type and gender

factor(Type)	1	2	ALL
1	26 0.7532051	35 0.6880952	61 0.7158470
2	29 0.5000000	36 1.0694444	65 0.8153846
3	28 0.8333333	37 1.1171171	65 0.9948718
ALL	83 0.6917671	108 0.9621914	191 0.8446771

factor(Type)	1	2	ALL
1	26 9.038462	35 8.257143	61 8.590164
2	29 3.000000	36 6.416667	65 4.892308
3	28 5.000000	37 6.702703	65 5.969231
ALL	83 5.566265	108 7.111111	191 6.439791

Tab.3: Binary factor: 1 is male, 2 is female contributions. 1-3 are treatments, respectively. Left transfers as shares of the equal share are stated. Right absolute transfers are indicdated.

B.2. Figures

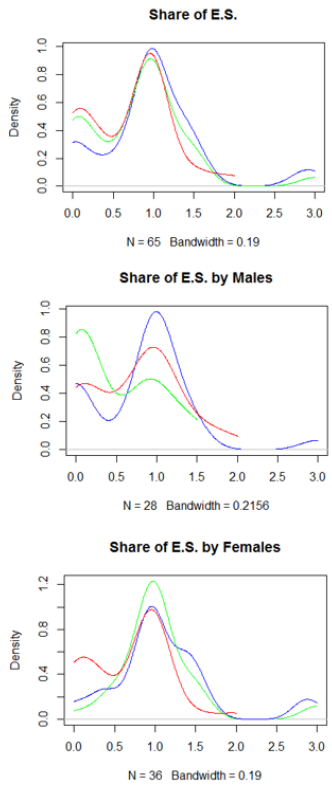


Fig. 10: Transfer distributions are presented by treatment. Transfers in Treatment 1 are red, Transfers in Treatment 2 are green, and transfers in Treatment 3 are blue. Means and distributions are significantly different from each other for males. Mean and distribution of Treatment 1 is significantly different from Treatment 2 for females.

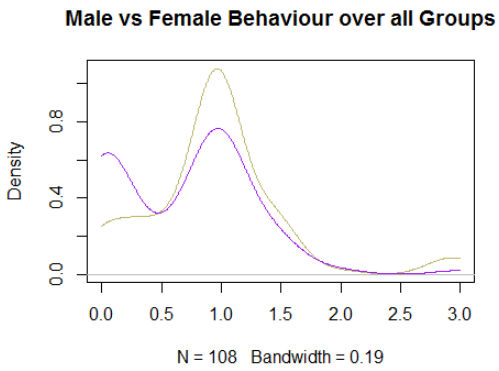


Fig. 11: Transfer distribution for male and females overall. Transfers across all treatment are pooled. The purple line are transfers by males and the dark khaki line are tansfer by females. Means as well as distributions are significantly different from each other.