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You get what you deserve! Reactance, greed and altruism in the dictator game with offer suggestions by the receiver

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Abstract

Offers in the Dictator game are considered altruistic behavior. Indicators of the need of the receiver like income or a specific request of the receiver influence proposers' decisions, along with traits such as greed and altruism. We investigated the combination of these influences in 140 participants.

A higher need by the receiver led to higher offers up to equal share demands unless reactance led to lower offers for high-income receivers. Correspondingly, low-income receivers got more money than other receivers if asking for little. Trait altruism led to higher offers, while trait greed led to lower offers in above equal share requests. We found exploratory unusually high offers in our paradigm, lower offers for women and for requests in general.

The present findings strengthen the concept of a "benevolent" non-harming for anyone nature of narrow altruism, while supporting the concept of greed including the possibility of getting more at the expense of others. Additionally, the role of need and reactance is shown in bargaining.

Keywords: altruism, dictator game, greed, dictator game with suggestion, reactance

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Human decision behavior has been extensively studied in the context of economic decisions.

Two very prominent views on economic decision behavior are given by classical game theory, where people in economic decision-making situations are expected to achieve the optimal benefit (Von Neumann & Morgenstern, 1944) and are assumed to follow rational choice theory, where individual actions are based on rational decisions between available alternatives (Kirchgässner, 2008; Von Neumann & Morgenstern, 1944). These perspectives are based on the concept of homo economicus: the human being as a rational and self-interested utility maximizer (e.g., Kirchgässner, 2008; Rodrigues et al., 2015). However, the importance of interindividual differences and non-rational behavior in economic decisions is considered more and more (e.g., Thielmann et al., 2020). To investigate human economic decision behavior, several paradigms with specific interaction features were invented and used in the past (see e.g. Thielmann et al. 2020). One of them is the ultimatum game (UG, Güth et al., 1982), that was later modified to the dictator game (DG, Güth, 1995; Kahneman et al., 1986a), which further challenges the model of homo economicus (e.g., Eckel & Grossman, 1996; Rodrigues et al., 2015; Thielmann et al., 2020).

The UG (Güth et al., 1982) is a simple decision scenario, where a player divides an amount of money between herself or himself and a recipient. The recipient has the choice of either accepting the offer so that both players receive their share or rejecting it so that no one receives anything. The maximum profit would be result for the proposer if he or she offered the smallest possible amount, while the rational recipient should accept all offers above zero. However, numerous research findings show that proposers give away larger sums than the minimum; recipients in turn reject very small amounts (Güth, 1995). Thaler's (1988) explanation for this observation is that the recipient assesses the fairness of the offer when making his decision and is willing to forego small profits to punish the proposer for unjust proposals. Therefore, in reaction to this behavior strategic considerations in a rational decision maker could justify the giving of larger shares than the minimum (Weiland et al., 2012). In order to neglect this strategic

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influence, Kahneman et al. (1986) developed the DG, a variation of the UG. Here, the recipient has no opportunity to reject or influence the offer made by the player acting as dictator, transforming the game to a simple decision situation (Forsythe et al., 1994; Kahneman et al., 1986b; Rodrigues et al., 2015). Since strategic considerations are now no longer a plausible motive for generous donations (Eckel & Grossman, 1996), profit maximization alone should determine the dictator's actions. However, contrary to the predictions of classical game theory, an average of 28.3 % of the available amount of money is given to the recipient (Engel, 2011), indicating that social or altruistic motives influence the gambler's behavior (e.g., Hewig et al., 2011; Thaler, 1988).

Providing the dictators with information about the receiver even further rises contributions, if a need of the recipient is indicated (Rodrigues et al., 2015) by low income. Similarly, if recipients are able to ask for an amount of money, the offers increased compared to if they were not able to communicate (Andreoni & Rao, 2011). Both approaches seem to communicate the need of the recipient, one as an active act of asking or suggesting an offer, the other as a framework of need provided by the circumstances. In this context we wondered, which effect of need indication would be stronger and what would arise from a discrepancy in the information about the need of the recipients. For example, if a high-income receiver asks for more, the proposer may interpret this as greedy or even exploitative behavior. This might lead to anger and reactance, a behavior contrary to what the receiver intended (Brehm, 1966, quoted according to Rains, 2013). As an example for reactance in the dictator game, Andreoni and Rao (2011) observed that high suggestions for an offer by the receiver, which were higher than the equal split, led to lower offers than more moderate suggestions. We expected this effect would be amplified if the information about a high income also hinted to a lack of need for the receiver. However, if the income hinted to a real need of the receiver in this context, we would expect the effect of reactance being dampened, as the high suggestion might be seen in the context of general need and then it would be congruent asking for more. Furthermore, we were interested in the specific trait influences of the traits altruism and greed that have been shown to influence dictator game decisions (e.g., Thielmann et al.,

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2020), and whether they would be still present in a paradigm with enriched information about the need of the receivers.

Contributions in the DG can be understood as helping behavior in the sense of Eisenberg's and Miller's (1987) definition of prosocial behavior as voluntary, purposeful behavior that results in an advantage for fellow human beings. Furthermore, considering the prosocial tendencies described by Carlo and Randall (2002), this behavior can be classified as altruistic (Eckel & Grossman, 1996; Edele et al., 2013; Rodrigues et al., 2015), since it is spontaneously and voluntarily displayed and requires personal costs. According to Carlo and Randall (2002), people differ in the situations in which they provide help, so the following six prosocial tendencies are differentiated: “altruistic”, “emotional”, “compliant”, “dire”, “anonymous” and “public”, although they do not claim these categories to be exhaustive. In this context, altruism is understood to be a “voluntary helping motivated primarily by concern for the needs and welfare of another, often induced by sympathy responding and internalized norms/principles consistent with helping others” (Carlo & Randall, 2002, p.32), following the definition by Eisenberg & Fabes (1998). Narrowing this definition even further, Rodrigues et al. (2018, 2020) stressed the importance of a non-harming “benevolent” intention in altruism, and showing that punishment is not related to altruism in this narrow sense in third-party interactions (Rodrigues et al., 2018, 2020). In this study, we follow this line of research and this narrow definition. However, as altruism has been researched in various sciences for a long time, there are many different definitions of altruism in the literature. For example, while Fehr and Fischbacher (2003, p.785) defined altruism from an economic perspective as “costly acts that confer economic benefits on other individuals”, Millon et al. (2003, p.20) described it from a social psychology perspective as a “desire to benefit someone else for his or her sake rather than one’s own” and Baumert et al. (2014, p.186) as an “inclination to take other people’s interests into account”. These broader definitions of altruism include also harming actions like punishment and may therefore be confound with motivational traits and states like anger (e.g., Pillutla & Murnighan, 1996; Rodrigues et al., 2018, 2020). Although only the offer and therefore a giving act is possible in the DG, offering less if anger arises due to incongruent information may be a form of punishment here. Therefore, we chose the narrow definition of

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altruism, leaving out the anger driven punishment aspect and expecting high offers for persons with high trait altruism.

Another very important aspect in economic decisions is greed. Since the financial crisis in 2008 and 2009 trait greed has become an important and growing research field (Mussel & Hewig, 2019). Mussel et al. (2015, p. 216) defined greed as “desire to get more at all costs” and explained, that “greed reflects the tendency to blank out possibly negative consequences that might arise for another entity from their excessive striving after desired goods” and “greed is rather composed by feeling unsatisfied considering all the things that are not yet possessed” (Mussel & Hewig, 2016, p. 57). Following this second line of thought, Seuntjens et al. (2015, p. 518) stressed the “experience of desiring to acquire more and the dissatisfaction of never having enough”. Across different economic games and risk games it was found that greedier individuals act more risky and selfish even at the expense of other players (Mussel & Hewig, 2016, 2019) and greed has been identified to lead to lower offers in the UG as well as in the DG (Mussel et al., 2018; Mussel & Hewig, 2016; Seuntjens et al., 2015; Thielmann et al., 2020), maximizing the personal gains of the proposers. Hence, we expected lower offers for persons having high trait greed, compared to persons with low trait greed.

Additionally, on an exploratory level, we investigated the influence of gender, on the offer decisions in our variants of the dictator game, as there is wide evidence for women getting and offering more in the DG (see also Braaas-Garza et al., 2016; Chowdhury et al., 2020; Engel, 2011; Klinowski, 2018). Secondly, the presence of the suggestion by the receiver was investigated to identify its influence in this informative DG, with the previous finding that the presence of a suggestion led to higher offers in a normal DG (Andreoni & Rao, 2011).

To sum up our hypotheses, we expected a main effect of the income of the receiver, low offers for high income and higher offers for low income, indicating the need of the receiver (Rodrigues et al., 2015). Also, a main effect of the offer suggestion was expected, with higher suggestions for an offer by the recipient leading to higher offers. Additionally, an interaction between these two types of information was expected, with lower dictator offers for a high offer suggestion and a high income of the recipient

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(compare Andreoni & Rao, 2011; Rains, 2013), but also a higher DG offer, for a low receiver income and a high suggestion, indicating the need of the participant even more. Further, a main effect for trait altruism of the dictator was expected, with higher offers for high altruistic dictators (Rodrigues et al., 2015). A main effect was also expected for trait greed, with lower offers for high greedy dictators (Thielmann et al., 2020). On explorative basis, gender as well as the presence of the suggestion was considered.

Methods

Ethical Statement

The recommendations of “Ethical guidelines, The Association of German Professional Psychologists” (“Berufsethische Richtlinien, Berufsverband Deutscher Psychologinnen und Psychologen”) and human rights were considered. Participation was voluntary and all subjects gave written informed consent in accordance with the Declaration of Helsinki before participating. The study was embedded in a cover story including the illusion that the game was played against real interaction partners. Additionally, participants were made to believe that the amount of money earned depends on their performance in the game. At the end of the experiment participants were told about these deceptions. The research project was approved by the local ethic committee.

Preregistration

The preregistration of the study is provided here: <https://osf.io/5qbfc>. However, as the preregistration is for an entire project and not only for the dictator game paradigm, only the hypothesis and analysis concerning the dictator game are investigated here.

Participants

A priori the required sample size was calculated using the software program G*Power (Faul et al., 2007). Power analysis assuming a large effect size of $f = .3145$ and $\alpha = .05$ and power $(1-\beta) = .80$ yielded a required sample size of $N = 160$ participants, see also <https://osf.io/5qbfc>. 161 complete datasets were collected. Due to the predefined outlier criteria of $z=3.29$ (Tabachnick & Fidell, 2007) for reaction time and mean decision to the offers and suggestions defined in the preregistration, 140 participants

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between 18 and 73 years of age ($\text{mean}_{\text{age}} = 26.71$, $\text{SD}_{\text{age}} = 9.92$; $n_{\text{women}} = 103$, $n_{\text{males}} = 37$; 73.6 % women) were included in the analysis. 87.9 % of the participants took money as remuneration. The average monthly income was 841.46 € ($\text{SD} = 539.38$ €). On average, participants wished to receive 3.39 credits ($\text{SD} = 0.73$) as recipients in the DG.

Procedure

Participants were recruited via an established local psychological experiment platform, mass e-mail distribution lists and social networks. To take part, subjects had to be at least 18 years old and show no psychological abnormalities to a near clinical extent. Participants were compensated for participation with ten euros or course credits in case of psychology students.

The study was embedded in a cover story, which created the illusion that the game was played against real interaction partners and that the amount of money earned (exchange rate 10 credits : 1 cent) would be converted into euros at the end of the experiment. Participants would receive a fixed amount of four euros and would be able to earn up to six euros additionally depending on their performance in the games. At the end of the experiment, the participants were debriefed.

The data collection process of the online study was divided into three phases: A questionnaire part and two game parts (see Figure 1). All parts were realized using the online questionnaire platform SoSci Survey (Leiner, 2019). In this study, only the questionnaire part and the DG part are considered.

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Figure 1: Schematic display of the project of the present study.

Note. The focus of the work is the DG and the influence of traits on this task. The economic cyberball is presented for the sake of completeness. The questionnaire part took about 15 minutes, the DG about 25 minutes, the economic cyberball about 15 minutes. Taken together, the whole study took about 60 minutes.

After registration, participants received the first personalized link to the personality questionnaires via email. Demographic information including age, gender, handedness using the Edinburgh Handedness Inventory (Oldfield, 1971), highest level of education and type of remuneration (money or course credit) was queried. The personality questionnaires (for details see trait measurement section below) were presented in the following fixed order: GREED scale, STAXI, PTM-R, STAI, SPF, IT. Subsequently, participants chose a date (at least 24h after the questionnaire part) for playing the DG.

To start the DG, a second personalized link was sent via email for the chosen experiment date. First, participants took the position of the receiver. They entered their own initials and rated their available income on a ten-point scale from 200 to 2000 euros. In addition, they selected the amount of credits (0, 2, 4, 6 or 8) they would like to receive in the recipient's position. The cover story contained the deception

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that these data would be presented to other participants in future experiments. Then, for most of the experiment, the participants were in the position of the dictator. They had to divide 8 credits between themselves and another player in each round (for details see paradigm section below). In every trial, information about the average monthly income in Euro of the receiver was given. Additionally, in some blocks, there was also information about how much the receiver would like to get. The experiment consisted of six blocks of 45 single trials each (= 270 trials). One of these six blocks contained only the initials and income of the receiver. In this block there were 15 trials from each income level (200 / 600 / 1000). In the remaining five blocks with the single trials described in Figure 2, each of the 15 combinations of conditions, the income level (200 / 600 / 1000) and the proposed offer (0 / 2 / 4 / 6 / 8) within a block was presented three times, leading to a presentation of every combination for 15 times across the blocks. There was a pause of 7 sec between the single blocks. Then the experiment continued automatically; with a manual click the next block started. Before these six trial blocks, two practice blocks without credit collection for the dictator's position were performed with 9 trials each (with and without the recipient's offer proposal). At the end of this session the participants chose another timeslot (at least 24h after the DG) in the schedule for the second game.

A third personalized link to the economic cyberball was sent via e-mail for the specific scheduled date similar to the DG. Details are not given in this context and can be seen in the preregistration (<https://osf.io/5qbfc>). At the end of the experiment, the participants were debriefed and information for the compensation was provided.

Paradigm

In this paradigm, the participants were in the role of the “dictator” and had to distribute money in each trial between oneself and a receiver, who was not able to react to the distribution. They could choose between the following distribution options: 8:0; 6:2; 4:4; 2:6; 0:8 (or 0:8; 2:6; 4:4; 6:2; 8:0). The left part of the distribution ratio was the participants’ share, the right part the recipients’ share. It was not disclosed who the second person was in each trial, and it was made clear that the contact is limited to only one economic interaction per person. The cover story contained the illusion that economic decisions

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regarding offers would be made by other players and that the proposed offers would be allocated to the recipients, i.e. previous participants, and that the own suggestion in the first part of the paradigm would be the basis for subsequent participants. Information about the recipient was given before each decision was made. The structure of the presentation was identical throughout: the initials of the recipient appeared at the top, followed by the monthly income in Euros (200, 600, 1000), optionally the non-binding suggestion for the distribution of the 8 credits ("This person would like to have credits"; 0, 2, 4, 6, 8) was presented. After 1500 msec, the five distribution options were displayed, and a selection was to be made by mouse click (no time limit). The decision was visualized in a red-blue (or blue-red) pie chart. After 800 msec the next single trial started (see Figure 2).

Figure 2: Structure of a Single-Trial in the DG.

Note. The player is in the dictator position. After the dictator receives information about the recipient (initials, income, non-binding offer proposal), he has to choose between five possible offer distributions of 8 credits. After the decision, a pie chart visualizes the distribution.

Trait Measurements

The *revised Prosocial Tendencies Measure* (PTM-R; Carlo et al., 2003; Rodrigues et al., 2017) was used to measure altruism. There are six specific types of prosocial tendencies: altruistic, emotional, compliant, dire, anonymous and public (Carlo & Randall, 2002). The PTM-R shows adequate internal consistency (Cronbach's α for early adolescence = .75, Cronbach's α for middle adolescence = .80), validity and temporal stability with two-week test-retest reliabilities of .67 for early adolescence and .71 for middle adolescence (Carlo et al., 2003). In the present study, the German version of the PTM-R was used (Rodrigues et al., 2017).

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The *GREED scale* (Mussel & Hewig, 2016) was used to assess dispositional greed and consists of 12 items. The one-dimensional scale is considered as valid and reliable due to its high internal consistency (Cronbach's $\alpha = .90$) and overall criterion-related validity with greedy behavior of $r = 0.39$ with $p < 0.05$ (Mussel et al., 2018).

Additionally, four further standardized personality questionnaires were used: the Saarbrücker Persönlichkeitsfragebogen (SPF; Paulus, 2009), the Interpersonal Trust scale (IT; Amelang & Bartussek, n.d.; Rotter, 1967) and German versions of the trait items of the State-Trait Anger Expression Inventory (STAXI; Schwenkmezger & Hodapp, 1991; Spielberger et al., 1988) and the State-Trait Anxiety Inventory (STAI; Laux et al., 1981; C. D. Spielberger, 1989). Also, demographic data was collected (see procedure section above).

Statistical Analysis

The statistical analysis was performed with Jamovi (version 1.6.8.0). To analyze the hypotheses, two general lineal models (GLM using ANCOVA function) with the categorical predictors „income“ (200 / 600 / 1000) and „suggestion“ (8:0 / 6:2 / 4:4 / 2:6 / 0:8) as well as the centered continuous predictors altruism and greed. As the constructs greed and altruism are expected to be dependent, the two models were computed instead of a combined one in order to avoid suppression effects due to collinearity. Violations of the sphericity assumption were compensated with the Greenhouse-Geisser correction. Significant main effects and interaction effects were further tested using pairwise post hoc t-tests and linear regressions in case of the continuous predictors. As an inference criterion the standard $p < .05$ was applied; the significance level was adjusted using Bonferroni-Holm procedure.

Additionally, on an exploratory basis, the influence of gender on the offer behavior of the dictators is investigated by adding the additional factor “gender” (male / female) to the previously stated analyses. Also, the influence of the suggestion is investigated using a GLM with the factors “type of DG” (normal DG / DG with suggestion) and „income“ (200 / 600 / 1000), as well as using simple *t*-test comparisons and 90 % confidence interval inclusion in order to check for equity.

Results

Descriptive Statistics

The sample had an average (standard deviation in brackets) altruism score of 4.24 (0.495); the lowest value was 1.67, the highest 5.00. The mean score on the Greed scale was 3.04 (0.84) with a range of 1.25 to 5.67 points. As expected, altruism and greed correlated significantly with $r = -.26$, on a $p < .01$ level.

DG offer in the DG with suggestion

The first model revealed a significant effect for the dictator's altruistic tendency, $F(1, 138) = 4.02$, $p = .047$, $\eta^2_p = .028$, with higher trait altruism leading to higher offers to the receiver ($r = .168$, see Figure 3). Furthermore there were significant main effects for the factors "income", $F(2, 276) = 46.23$, $p < .001$, $\eta^2_p = .251$, $c_{GG} = .598$, and "suggestion", $F(4, 552) = 27.84$, $p < .001$, $\eta^2_p = .168$, $c_{GG} = .368$, see Figure 4 and Table 1.

Figure 3: Mean amount of money kept by the dictator dependent on trait altruism (A) and trait greed (B).

Note. $N = 140$. Both figures show the dictators' mean decision depending on their trait score. In one trial dictators could keep 0 to 8 credits for themselves. A shows the dictators' average decision depending on their altruism score. Altruism scores could vary between 1 and 5. B shows the dictators' average decision depending on their greed. Greed scores could vary between 1 and 7. Error bars show standard errors.

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Table 1: Post Hoc Comparisons of the Number of Credits Dictators Kept for Themselves Depending on the Recipient's Suggestion

Comparison			Mean Difference ^a	<i>t</i> (552)	<i>p</i> _{holm}
Suggestion		Suggestion			
0	-	2	0.531	4.034	< .001
	-	4	1.089	8.268	< .001
	-	6	1.175	8.923	< .001
	-	8	0.995	7.556	< .001
2	-	4	0.558	4.233	< .001
	-	6	0.644	4.889	< .001
	-	8	0.464	3.521	0.002
4	-	6	0.086	0.656	0.953
	-	8	-0.094	-0.712	0.953
6	-	8	-0.180	-1.368	0.516

Note. *N* = 140. For all pairwise post hoc *t*-tests the mean differences of the average number of credits kept in one trial are shown. ^a SE = 0.13 for each comparison.

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Figure 4: Mean Number of credits kept by the dictator depending on income of the receiver and the suggestion for an offer.

Note. Recipient's income in Euros. Dictators could keep 0 to 8 credits for themselves. All graphs show the average number of credits retained by the dictators in one run. A shows the main effect of the decision depending on the monthly income of the recipient. B shows the main effect of the game decision depending on the proposed offer of the recipient. C shows the interaction of the income of the receiver and their proposal. Error bars show standard errors. *** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .01$.

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The interaction between “income” and “suggestion” was also significant, $F(8, 1104) = 8.83$, $p < .001$, $\eta^2_p = .060$, $c_{GG} = 0.585$, with the deviation of the high monthly income and a high suggested offer leading to lower offers of the dictator. Also, the influence of a low offer suggestion was dampened if the monthly income was low (see Figure 4 and Table S1 in supplemental material).

There were no significant effects for the two-way interactions of the dictator’s altruistic tendency with the effect of income, $F(2, 276) = 0.17$, $p = .721$, $c_{GG} = 0.598$ and proposal, $F(4, 552) = 1.36$, $p = .255$, $c_{GG} = 0.368$, nor for the three-way interaction, $F(8, 1104) = 0.83$, $p = .520$, $c_{GG} = 0.585$.

The second model showed a marginally significant effect for the dictator’s greed, $F(1, 138) = 2.98$, $p = .087$, $\eta^2_p = .021$, see Figure 2. Like the first model it also detected the significant main effects of income, $F(2, 276) = 46.19$, $p < .001$, $\eta^2_p = .251$, $c_{GG} = 0.597$, suggestion, $F(4, 552) = 28.63$, $p < .001$, $\eta^2_p = .172$, $c_{GG} = 0.371$, and their interaction, $F(8, 1104) = 8.85$, $p < .001$, $\eta^2_p = .060$, $c_{GG} = .584$. Moreover, the recipient’s suggestion of an offer interacted with the dictator’s trait greed, $F(4, 552) = 5.34$, $p = .011$, $\eta^2_p = .037$, $c_{GG} = 0.371$. This interaction indicated a significant influence of greed if the receiver wants to get more money (6 credits: $r = .232$, $p < .01$, 8 credits $r = .259$, $p < .01$, see also Figure 5). Greedy people kept more money if the receiver suggested a high amount for him- or herself.

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Figure 5: Influence of the interaction of trait greed of the dictator with the suggested offer by the proposer on the offer of the dictator.

Note. Dictators could keep 0 to 8 credits for themselves. All graphs show the average number of credits retained by the dictators in one run. Error bars show standard errors. The influence of greed on the kept money is seen if the receiver wants to get more money.

The two-way interaction of the dictator's trait greed with the factor "income", $F(2, 552) = 0.05$, $p = .867$, $c_{GG} = 0.598$ and the three-way interaction $F(8, 1104) = 1.08$, $p = .371$, $c_{GG} = 0.584$ did not yield any additional predictive value regarding dictators' offer behavior.

Exploratory Analyses

Influence of gender on offer behavior

For the influence of gender on the money that was kept by the dictator, the exploratory analysis revealed a significant main effects of the between-subjects factor "gender" ($F(1, 137) = 9.51$, $p < .01$, $\eta^2_p = .065$ model with altruism; $F(1, 137) = 9.47$, $p < .01$, $\eta^2_p = .065$ model with greed), while all interactions

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and main effects in the models are preserved. The main effect of gender leads to higher offers given by men compared to women (see Figure 6).

Figure 6: Gender difference for the mean money kept by the dictator in the DG.

Note. Scores of the mean money kept by the dictator are shown for men and women. The scale for the mean money kept total ranges from 0 to 8 credits. Error bars show standard error. ** $p < .01$.

Influence of the suggestion in the DG

The influence of the suggestion was investigated exploratorily and led to the known significant effect for income of the receiver $F(2, 278) = 68.30, p < .001, \eta^2_p = .329, c_{GG} = .576$. However, there was also an effect for the presence versus absence of the suggestion, with the type of DG $F(1, 139) = 12.02, p < .001, \eta^2_p = .08$, with the information about the suggestion generally leading to lower offers in the dictators (see Figure 7.). Also, an interaction of the income of the receiver with the type of DG was found $F(2, 278) = 24.52, p < .001, \eta^2_p = .150, c_{GG} = .651$, with an inversion of the effect of keeping more money for oneself in the DG with suggestion if the receiver has a high income (see Figure 7). When a suggestion or request is present, dictators keep more when being confronted with medium or low income but keep less when confronted with high income.

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Figure 7: Mean Number of credits kept by the dictator depending on income of the receiver and type of DG.

Note. Recipient's income in Euros. Dictators could keep 0 to 8 credits for themselves. All graphs show the average number of credits retained by the dictators in one run. A shows the main effect of the decision depending on the monthly income of the recipient. B shows the main effect of the game decision depending on the type of DG. C shows the interaction of the income of the receiver and the type of DG. Error bars show standard errors. *** $p < .001$, ** $p < .01$, * $p < .05$.

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A direct comparison of the offer behavior with suggestion to the normal DG can be seen in Table 2 and Table 3. In essence, the participants offers in the normal DG are equal to the offers in the case of the suggestion of six or eight credits when the low income is present, to the suggestion of eight credits if the middle income is present and to the suggestion of two credits or eight credits, if the highest income is given.

Table 2: Comparison of the money kept by the dictator in the DG without a suggestion and with suggestions for the different income conditions.

							95% confidence interval	
							Lower	Upper
		<i>t</i> -value	df	<i>p</i> -value	mean difference	SE difference		
200 income dicator game no suggestion	200 income suggestion 0	-6.51	139	< .001	-1.21	0.186	-1.518	-0.902
	200 income suggestion 2	-6.368	139	< .001	-0.819	0.129	-1.032	-0.606
	200 income suggestion 4	-3.572	139	< .001	-0.361	0.101	-0.529	-0.194
	200 income suggestion 6	-0.692	139	0.49	-0.074	0.108	-0.253	0.104
	200 income suggestion 8	-0.497	139	0.62	-0.064	0.129	-0.279	0.15
600 income dicator game no suggestion	600 income suggestion 0	-6.909	139	< .001	-1.034	0.15	-1.282	-0.786
	600 income suggestion 2	-5.614	139	< .001	-0.448	0.08	-0.58	-0.316
	600 income suggestion 4	2.019	139	0.045	0.124	0.061	0.022	0.226
	600 income suggestion 6	2.442	139	0.016	0.206	0.084	0.066	0.346
	600 income suggestion 8	0.473	139	0.637	0.058	0.122	-0.144	0.26
1000 income dicator game no suggestion	1000 income suggestion 0	-4.03	139	< .001	-0.595	0.148	-0.839	-0.35
	1000 income suggestion 2	0.246	139	0.806	0.023	0.094	-0.132	0.178
	1000 income suggestion 4	6.826	139	< .001	0.665	0.097	0.504	0.827
	1000 income suggestion 6	5.024	139	< .001	0.556	0.111	0.373	0.739
	1000 income suggestion 8	1.114	139	0.267	0.154	0.138	-0.075	0.382

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Table 3: Mean offer of the dictator depending on the type of dictator game and the income of the receiver.

type of dictator game	income of the receiver	mean offer of the dictator	SE of the offer	offer of dictator in percent
DG with suggestion	overall	3.44	0.107	43.00%
	200	4.031	0.132	50.39%
	600	3.383	0.132	42.29%
	1000	2.907	0.132	36.34%
normal DG	overall	3.628	0.107	45.35%
	200	4.537	0.132	56.71%
	600	3.603	0.132	45.04%
	1000	2.746	0.132	34.33%

Discussion

In this study, we investigated the influence of an expression of the wish of offer by the DG receiver on the DG offer. Also, we manipulated the average monthly income of the receiver. Additionally, we were interested in the influence of trait greed and trait altruism on the donation behavior of the dictator.

As hypothesized, it was found that dictators give the more credits to the recipient the poorer the recipients were and the more the recipients wanted, although this main effect was only present up to the suggestion of an equal split. Furthermore, as hypothesized recipients with high income and high money suggestion in combination got lower offers the dictators, which is in line with reactance or altruistic punishment. In contrast to the hypothesis that a low income would lead to higher offers in case of a high suggestion, we only found an absence of a similar reactance as for high income. In addition, we found that the effect of giving less money for a low receiver suggestion was dampened, given their monthly income was low. These results suggest that the participants share their money according to their perception of the needs of the recipient (Rodrigues et al., 2015). One indicator of these needs is the monthly income of the receiver. As shown before, participants react strongly to this information and offer more money if the receiver has less money and therefore a higher need for money or help (Eckel & Grossman, 1996; Rodrigues et al., 2015). In this paradigm however, we added a second indicator of their need and the opportunity for communication about their need, by a non-binding suggestion of the offer. As expected, this suggestion had an influence on the offer behavior. Although the suggestion was non-binding, a higher suggested offer by the receiver led to a higher offer by the dictator. Here, the effect of the suggestion was in generally connected to the equal split. If the recipient demanded more than half of the amount to be distributed, this had no further effect on the donation behavior. This observation is well consistent with the finding that requests for more than half the amount of an endowment tended to result in lower contributions (Andreoni & Rao, 2011). Hence, an equal distribution of a resource seems to be generally considered as adequate. If one waives a part of his (adequate) share, he or she legitimizes that the others take a part of the resource that is larger than adequate. If one demands a part of the resource that is larger

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than the adequate part, the other does not feel obliged to comply with this wish. This manipulation of an additional indication of needs with a communicative aspects sheds an interesting light on the differences of DG and the UG (Güth, 1995; Güth et al., 1982). Although the suggestion of the offer has no consequences at all for the participants, they can use it in order to behave in an altruistic manner, by offering money that they could just keep for themselves, especially if a need is explicitly indicated. As they react with offering more money to a higher suggestion, this information is validly used. However, surprisingly and not in line with the finding that the recipient's ability to communicate with the dictator generally has a positive influence on his or her dispensing behavior (Andreoni & Rao, 2011) it is not to the advantage of the recipient, if this information is available. In the exploratory analysis of the influence of the suggestion on the DG offers, there was the main effect of the suggestion leading to lower offers for the receivers (see Figure 7). However, it was astonishing, how high the offers were in both cases, as they greatly exceeded the average dictator game offer that was to be expected (28.3%, Engel, 2011) by about 15% (no suggestion DG: 45.35 %, suggestion DG: 43 %, see Table 3). This discrepancy to the literature is unexpected and may reflect a bias in sampling, the specific setting of the experiment or the impact of the present crisis of COVID-19 on prosocial behavior in general (e.g., Ye et al., 2020). Given the very high general level of the dictator game offers, the differences in the DG without the suggestion and with suggestion are hard to interpret, but they may most likely be due to the lower offers given to receivers that indicate that they don't want any money at all or just a very small share (see Table 2). As this information of the need of the recipient is in some cases contradictory to the information given by the monthly income, the effects of offering less in this DG with suggestion compared to the normal DG is only present in the condition with low and middle monthly income. In contrast, the contradictory information of wanting more money although one does already have a high monthly income on average leads to higher offers if a suggestion is possible compared to the normal DG. The participants seem to use the information about the wanted offer as a kind of excuse to keep more money to themselves in general (compare other excusing effects Mellers et al., 2010; Panchanathan et al., 2013), as only in the highest income category they offered more on average to the recipient if they wanted more (see Table 2). Nevertheless, one has to keep

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in mind, that the offers are generally very high. However, the effect of the suggestion of the offer in the highest income shows another interesting hypothesized mechanism: lower offers were made if the recipients with high income were asking for more money. This could be well due to psychological reactance (Rains, 2013), with the arising anger driving a kind of punishment reaction in this DG (compare Pedersen et al., 2013; Pillutla & Murnighan, 1996; Rodrigues et al., 2018, 2020), leading to lower offers. This is in line with other findings of anger driving punishment behavior (Seip et al., 2009, 2014), also stressing the importance of the susceptibility to anger: trait anger.

Coming to the trait influences on the offer behavior in these variants of the DG, according to our hypotheses, we found higher offers for higher trait altruism. This is in line with many findings, that trait altruism leads to higher offers in the DG (e.g., Eckel & Grossman, 1996; Hilbig et al., 2015; Rodrigues et al., 2015). As this is not due to a difference in the perception of what is seen as a fair distribution (Rodrigues et al., 2015), the altruistic behavior seems to be a decision to offer fairer offers to receivers, who have no opportunity to react to the distribution. Interestingly, there is no significant interaction with the suggestion of the receiver, but only a main effect for altruism, leading to a more generous offer for all receivers and all suggestions. This stresses the independence of altruism from the situational needs or crisis induced needs (e.g., Carlo et al., 2003, 2010; Carlo & Randall, 2002; Rodrigues et al., 2017), and the difference of altruism as compared to other categories of prosocial behavior, like direct prosocial behavior or emotional prosocial behavior. Hence, the trait construct of altruism is in this case the benevolent helping behavior (Rodrigues et al., 2018, 2020) that accepts no harm to any of the receivers, independent of their income or suggestion.

For trait greed however, we did not find the hypothesized main effect of keeping more money if a higher trait greed is given, but an interaction of trait greed with the suggested amount of money by the receiver, leading to the effect of lower offers if the recipients wanted more money. This effect may be due to the higher trait activation characteristics of the high suggestion conditions for trait greed, leading to a situation, where the trait shows its influence, compared to situations with the wrong intensity of trait activation (compare Mussel et al., 2015; Rodrigues et al., 2021). In the conditions, where the receivers did

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not want much money, all participants used this information to offer less money in the same way (except they are highly altruistic). However, if the recipients wanted more money, trait greed led to lower offers, stressing the definition of getting more at all costs, including the excessive striving for desired goods and the willingness to accept that such striving may be at the expense of others (Mussel et al., 2015). Hence, the behavior is well in line with other findings about greed, although not being a main effect but specific if the participants do want a bigger share. This sheds additional light on the consequences of greed also in society, depriving others of the needed goods, also and in this case especially if a need is explicitly indicated. Greedy participants may have interpreted higher suggestions of other participants as a cue, a trigger or an excuse to keep more for themselves.

Another interesting finding on trait level is the non-hypothesized gender effect of women offering less money in this DG. Contrary to the finding of the present study, there is wide evidence for the opposite effect in meta-analyses (Engel, 2011), with women getting and offering more in the DG (see also Braaas-Garza et al., 2016; Chowdhury et al., 2020; Klinowski, 2018). As the present results are inconsistent with previous research on gender-specific differences in the DG, the specific setting of the experiment with the unusually high dictator game offers (see Table 3) and the general decision tendencies of men and women could be of importance. While men tend to decide extremier in the sense of either being very selfless or very selfish, women tend to decide neither very selfless nor very selfish (Andreoni & Vesterlund, 2001). Additionally, women seem to be more generous when altruism is expensive while men are more generous when altruism is cheap (Andreoni & Vesterlund, 2001; Visser & Roelofs, 2011). As the paradigm did not handle a high amount of money but only small credit sums that translated to cents, being generous was probably seen as a cheap action in this case and the male participants may have decided more often to go for being selfless in this paradigm. In addition to these factors, the framing of the offer also may have an influence. Women tend to spent more money to the recipient under a taking frame (you take from this amount of money, the rest goes to the receiver) than under a giving frame (the receiver gets this amount of money, the rest goes to you), choosing smaller numbers in general (Chowdhury et al., 2017). A reversed effect occurred for men, offering more under the giving than under the taking frame,

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tending to choose higher numbers as women in general (Chowdhury et al., 2017). As our framework was neither a strict giving frame nor a taking framework, but instructions were more similar to a giving framework, the participants may have behaved accordingly with men choosing higher offers to the recipients. These effects might have led to the findings that men are more altruistic than women in our paradigm. In addition, since the paradigm was an online-paradigm no experimenters were present to reinforce social desirability bias, which is much higher for women than men and which confounds ethical decisions for example in economic decision games (Dalton & Ortegren, 2011). The latter may have reduced female offers. Hence, the computer-based interaction provided in this study in their home setting might have led to this result, along with the challenging situation of less normal human interaction that is presently experienced due to the COVID-19 pandemic in Germany (e.g., Weiß et al., 2020).

Limitations

Although a broad sample was aimed for, the sample consisted mainly of women, students (especially psychology students) and participants under the age of 30 years. Additionally, the altruism scores indicate a relatively altruistic sample (mean of altruism = 4.24, SD = 0.495). Further, most of the participants belong to the academic class. This could be due to an advertising that was too narrow and only reached a certain group of people from the field of psychology, and this limits the findings substantially. However, the uniform sample can also be advantageous in order to ensure an equal understanding of high and low income and of other aspects of the study design (see Rodrigues et al., 2015). This may have supported the significance in terms of income effects. Nevertheless, the generalizability of the findings is limited. One possible solution for future studies would be a uniform student sample, which is recruited on the basis of an a priori conducted questionnaire study on altruism. This would fulfill the requirement of a broad altruism pool as well as an almost equal understanding of high and low income (Rodrigues et al., 2015).

A second limitation was the use of a cover-story, instead of a real interaction game with real persons. However, as we were interested in a complete experimental matrix and the DG does not provide any real interaction at all, we chose to use the paradigm as it was presented. However, as the setting is

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almost a natural one, in future studies, one may try to use a real interaction instead of the fictive receivers, in order to avoid possible behavioral alteration and unnecessary deception.

Another problem was caused by the current COVID-19 pandemic, which prohibited laboratory research and thus made data collection more difficult. As a result, the study was conducted exclusively online and there were no possibilities except from the instructions to ensure the experimental setting and to prevent disruptions or interruptions. Initially, a considerable number of participants reported various technical problems in the implementation of the paradigms, such as pages not loading or skipping, which led to a massive amount of unusable data. Due to the complications that arose, a significant number of participants discontinued the study completely and decided against further participation, while others could be motivated to repeat parts of the study that were not functional at their first attempt by increasing the remuneration by 0.5 VP hours or five Euros. Hence, the compensation was not entirely equal for every participant.

A further limitation is the interaction of trait greed and trait altruism with the paradigm. The DG does not allow for separate effects of altruism and greed on the amount of the offer, because both traits potentially influence the same action (see e.g., Rodrigues et al., 2018). Furthermore, there are only two persons involved in the DG. This results in an impossibility to differentiate between generally wanting more money in case of the dictator or wanting more than the others have. Therefore, using the DG, it is not possible to study this specific aspect of greed, which is given as the interest in wanting to have more than others.

Another important fact is that duration of the experiment and the different times of day when the experiment was conducted. Due to the scope of 270 trials in the entire DG, fatigue effects may have influenced the behavior and as the experiments were scheduled from 8 a.m. to 8 p.m. The different processing times may have influenced the concentration of the participants, especially as we were not able to control for them having a quiet and isolated experiment room. Instead, we had to trust them that they follow the instructions to ensure these prerequisites.

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The final limitations come with the experimental design and with the combination of the income and the suggestion as two indicators of need, without dropping the information about the income in one block. As they are both given in the suggestion DG, no simple effects of the suggestion can be investigated and therefore a direct comparison to previous findings (Andreoni & Rao, 2011) is not possible. Future research could also include experimental blocks only investigating the suggestion without the influence of income. Furthermore, future research should investigate whether the stability of the exploratory gender effect on the money kept in the DG is stable. Moreover, one may also try to replicate and extend the findings along with a more representative sample and further manipulations on the dictator and recipient side, including also variables like social desirability. Finally, future research may want to transfer these findings to other interaction paradigms (e.g., the third-party DG), that allows investigating the effects of altruism and greed separately and in a more interactive context.

Conclusion

In this study, we investigated the influence of the monthly income and the wish for money from a fictive receiver and trait altruism, trait greed and gender from the dictator on the DG offer.

A higher need by the receiver, indicated by low monthly income and by demands for higher offers led to higher offers. Demand above equal share did not lead to higher offers, in contrast leading to reactance and lower offers in particular if a high monthly income was given for the recipient. On the other hand, if a low income was given, relatively higher offers were given if only few was asked for. Taken together, higher suggestions of high-income participants were punished while lower suggestions of low-income people were rewarded in comparison to the other groups.

However, if information about the suggested offer was present, the dictators offer less than if it was absent in general. One exception is that for high income of the receivers more money was offered if a suggestion was present. For trait altruism, we found higher offers, independent of the suggested offer, while for trait greed, the influence was seen for above equal share suggestions, leading to lower offers in these cases. Additionally, we found an unexpected gender effect, with women showing lower offers compared to men, in contrast to a vast body of evidence.

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The present findings highlight the importance and interplay of information and personality for prosocial behavior. The concept of a “benevolent” non-harming anyone nature of altruism is corroborated, while the findings are also supporting the concept of greed including the possibility of getting more at the expense of others, even if they indicate being in need. Additionally, the role of need and reactance is shown while providing general information about the need leads to more helping behavior, yet too high demands or conflicting information may lead to reactance as an exploitation of goodwill is to be assumed. Finally, the importance of settings for example like a real human interaction vs. a computer context, or the influence of social desirability on gender effects in economic decision studies may have to be reconsidered. Given the evidence, the present study sheds a comforting light on human prosocial behavior in the DG, as despite the influence of greed and unusual effects for gender in this computer based setting, people still respond to indications of need, helping even more if explicit information by an offer suggestion is lacking.

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Data availability statement

The data will be made available on the OSF repository (non-frozen version of the project: <https://osf.io/e6w32/>)

Author contribution statement

Rodrigues: Designed and programmed the experiment, analyzed the data, project administration, funding acquisition, writing: original draft, review & editing: manuscript.

Caporale: Collected the data, analyzed the data, writing: original draft of the manuscript

Euen: Collected the data, analyzed the data, writing: original draft of the manuscript

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Schäfer: Programmed the experiment, data handling, writing: review & editing: manuscript.

Schneider: Collected the data, analyzed the data, writing: original draft of the manuscript

Hewig: Resources; funding acquisition, supervision; writing: review & editing: manuscript