Money and flexible generosity

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Previous research on money and prosociality has described a monotonic pattern, showing that money reduces generosity. The present research aimed to examine whether money differently impairs generosity when arising from altruistic versus egoistic motives. To this end, we employed economic games designed to study generosity (e.g., the Dictator game) and varied experimental currency (i.e., money vs. candy/food). The results ($N = 850$) showed that although money made people ignore others when others were not crucial for their future gain, generosity was not impacted when egoistic motives (Study 1: avoiding sanctions; Studies 2 and 3: building reputation) were present. In other words, although people in general showed flexible prosociality by adjusting their generosity level according to game type, this was much more strongly the case when money rather than candy/food was the currency. In addition, we demonstrate a boundary condition of money on flexible generosity, namely imbuing money with prosocial meaning (Study 3). Some implications are discussed.

Much of the previous research on money and prosociality has described a monotonic pattern, consistently showing that money or situating people in a monetary context reduces generosity (e.g., Gasiorowska, Chaplin, Zaleskiewicz, Wygrab, & Vohs, 2016; Roberts & Roberts, 2012; Vohs, Mead, & Goode, 2006). Interestingly, prosociality in human societies does not strictly arise from purely altruistic motives (i.e., genuine care and self-sacrifice). Egoistic motives, such as expecting to receive something in return or avoiding sanctions, also play a large role (Batson & Powell, 2003). If maximizing self-gain is the fundamental intention in monetary contexts, people should not opt out of generosity entirely in such contexts. Therefore, the current research aims to test whether the negative effect money has on generosity is subject to the influence of moderators. In particular, we propose that when appropriate rules are imposed by making the benefits of acting generously larger than those of coercion, the negative effects money has on generosity can be alleviated.

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[Correction added on 19-April-2022, after first online publication: The copyright line was changed.]

Market pricing mode, prosociality, and self-gain

Relationships based on market pricing are primarily formed to materially benefit people from interacting outside their close social ties, with economic trading serving as the prototypical example (Fiske, 1992). Although past research studied money from various perspectives – including exposing people (temporarily or chronically) to money, having money, desiring money, and situating people in economic contexts – these studies demonstrated consistent findings (Wang, Chen, & Krumhuber, 2020). In particular, money (operationalized as a broad concept as illustrated above) causes people to engage in self-serving behaviour, exclude others from consideration, and favour a self–other distinction; it also facilitates an instrumental approach in social relations and fosters unethical behaviour (for a review, see Wang et al., 2020).

Of particular relevance to the current research, money can impair generosity and sharing. Activating monetary thoughts by exposing (adult) participants to monetary (vs. neutral) phrases, or letting them count money (vs. sheets of paper) reduced the amount of money donated to a university student fund (Vohs et al., 2006) and the amount of money shared with a stranger (Gąsiorowska & Hełka, 2012). When money (vs. candy) acted as the currency in the economic games, participants became less generous on average by sharing less resources with their game partners (Wang, Krumhuber, & Gratch, 2018). After seeing an image of money (vs. a Thanksgiving cornucopia), adolescents ranging in age from 13 to 14 gave less to a charity (Roberts & Roberts, 2012). Even more striking, this effect is also present among children. As such, handling money (vs. buttons or candies) reduced the number of stickers children gave to their peers (Gasiorowska et al., 2016).

These consistent and robust findings can be explained by a market pricing mentality that construes social relations with others in the manner of a cost versus benefit analysis (Mead & Stuppy, 2014). Although fairness is generally valued (Henrich et al., 2010), people are also fundamentally motivated to maximize self-gain in a costs-benefits calculation (Mead & Stuppy, 2014). Several empirical studies support this notion (Bauer, Wilkie, Kim, & Bodenhausen, 2012; Sheldon & McGregor, 2000; Wang et al., 2018). Given that resources are usually limited, focusing on one's own gain would undoubtedly result in fewer resources for others.

Prosociality resulting from egoistic and self-serving motives

Although in recent decades empirical evidence has supported the notion that human (and nonhuman primates) show a default tendency towards prosociality (Keltner, Kogan, Piff, & Saturn, 2014; Rand, Greene, & Nowak, 2012), it is essential to note that individuals can behave prosocially for various reasons. Even though prosocial behaviour can arise from selfless motives (e.g., people act on others' behalf simply because others are in need and independently from any benefits to the self; Batson & Powell, 2003), one cannot assume that all prosocial acts are driven by pure altruism (Konrath, Ho, & Zarins, 2016). Recent theoretical accounts noted that self-serving and egoistic inclinations can also lead to prosocial behaviour (Batson, 2011; Keltner et al., 2014). These inclinations can range from receiving something material in return to gaining social praise (Batson, 2011), or merely increasing one's positive self-image (e.g., self-esteem; Le, Impett, Kogan, Webster, & Cheng, 2013) and reducing uncomfortable feelings (e.g., guilt; Cohen, Panter, & Turan, 2013). In fact, several scholars have argued that prosocial acts result from costs versus benefits analyses and that people engage in such behaviours when the benefits of action or the costs of inaction are larger than the costs of action (e.g., Keltner et al., 2014; Nowak, 2006).

In human society, prosocial acts are mostly based on social norms (e.g., Fehr & Fischbacher, 2004). Actions that violate such norms are often sanctioned, resulting in low payoffs. In other words, people could simply engage in prosocial acts to avoid personal costs brought on by sanctions (e.g., Balliet, Mulder, & Van Lange, 2011). In this vein, reciprocal altruism (i.e., one party temporarily foregoing own benefits for the other party, with the expectation that the other party will later reciprocate, Trivers, 1971) and reciprocated concessions (i.e., a party making more generous offers in negotiations to achieve a win-win situation, Thompson, 2006) are typical examples of self-serving prosociality. That is, in the examples above people are guided by wanting to benefit themselves, given the expected rewards or the absence of punishment (Fehr & Fischbacher, 2004).

Similarly, one's reputation – the evaluation and impressions of others regarding one's character – can be determined largely by whether one acts prosocially within a community (Keltner, Van Kleef, Chen, & Kraus, 2008). One's reputation in turn brings benefits. For instance, participants are willing to share resources with players who have a history of behaving generously rather than greedily (Wedekind & Milinski, 2000). In addition, participants who show a higher level of generosity in economic games later receive more money from other participants and enjoy increased popularity when their generous acts are made public (Milinski, Semmann, & Krambeck, 2002). Thus, acting generously to build one's reputation, which facilitates later gain, is also a type of prosociality driven by egoistic motives.

Given that people can act prosocially resulting from altruistic and egoistic motives, money should not make people opt out of prosociality entirely or reduce all types of prosociality to the same extent. Instead, money could encourage people to engage in more calculated and instrumental behaviour, being sensitive to the costs and benefits of exchange. Money might impair genuine altruism, but it may not affect prosocial acts that arise from self-serving and egoistic motives to the same extent. In other words, money could result in an increased level of flexible prosocial behaviour (i.e., adjusting the level of prosociality facing different situations) guided by the motivation to maximize self-gain in this process. Preliminary supporting evidence comes from a study examining narcissistic people (i.e., individuals who show impaired perspective-taking and empathy; Konrath et al., 2016). Interestingly, these people demonstrated prosociality when such acts could serve as a means to other ends, including to ensure others' reciprocity or to gain social attention.

Furthermore, although money may encourage people to show flexible prosociality, imbuing money with prosocial meaning could be a boundary condition. A number of studies revealed that giving or spending money on others promotes social connection and relatedness (Dunn, Aknin, & Norton, 2014). Importantly, this effect is universal (e.g., Aknin, Barrington-Leigh, et al., 2013) and can even be observed among toddlers under the age of 2 (Aknin, Hamlin & Dunn, 2012). Therefore, imbuing money with prosocial meaning (e.g., giving/donating money to others) could possibly shift people away from focusing on themselves and their own gain, making them engage in flexible prosociality to a lesser extent.

The present research

The present research primarily tested whether money does not impair all types of generosity to the same extent. Specifically, we examined if money affects generous acts that arise from egoistic motives (i.e., Study 1: avoiding sanctions; Studies 2 and 3: building reputation) to a lesser extent than acts that arise from altruistic motives. In other words, we are interested in whether money leads to an increased level of flexible generosity (i.e., adjusting the level of prosociality facing different conditions). Finally, we investigated a

boundary condition of this effect, namely whether such flexible generosity can be reduced when imbuing money with prosocial meaning (Study 3).

To this end, we employed economic games that have been designed to study generosity/sharing (i.e., the Dictator game [DG] and the Ultimatum game [UG]). To create a monetary context, we followed the experimental paradigm employed by Wang et al. (2018). Specifically, money was used as currency in these games (money condition). In contrast, candy (Study 1) or food (Studies 2 and 3) was used as currency for those in control conditions (for a similar procedure, see Gasiorowska et al., 2016; Heyman & Ariely, 2004; Wang et al., 2018).[1]

Importantly, our research extends prior findings in this field, making two important contributions. First, while past research has described a monotonic pattern of money impairing generosity, our research aimed to go a step further by demonstrating that money does not impair all types of generosity to the same extent (those that arise from altruistic vs. egoistic motives). Instead, it makes people highly sensitive to the personal outcomes of prosocial acts. Second, when explaining prosocial behaviour, researchers examined internal factors, such as altruistic motivations and other-regarding preferences, and external social forces, including social norms and reputation systems, (often) in a parallel manner (Simpson & Willer, 2015). In the current work, we tested how external factors (i.e., sanctions and reputation) influence prosocial behaviour via an internal factor (i.e., a motive to maximize self-gain).

STUDY 1

Study 1 examined whether the level of generosity impaired by money would vary according to the presence of a possible sanction. In particular, participants played both the DG and UG in the allocator role. Although counterplayers in the DG had to accept any offers made, those in the UG were allowed to reject them. We predicted that (1) money, compared to candy, as the currency would impair overall generosity; (2) people are more generous in the UG than in the DG, as people are dependent on their counterplayers to achieve good payoffs in the UG; crucially, (3) such flexible generosity (i.e., increased generosity in the UG than DG) would be more pronounced for those in the money than the candy condition: money (compared to candy) should reduce generosity in the DG to a greater extent than UG; and (4) this increased level of flexible generosity in the context of money should be mediated by the motive to maximize self-gain.

Method

Participants and design

We recruited 239 American participants (91 women, $M = 30.6$, $SD = 8.9$, 81% Caucasian, 9% Asian, 10% others) via Amazon Mechanical Turk. The two-factor experimental design included the type of experimental currency (money vs. candy) as a between-subjects variable and game type (DG vs. UG) as a within-subjects variable. Participants were randomly assigned to one of the two currency conditions (approximately $N = 120$ people per condition). Participants received $2 as compensation at the end of the study.

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[1] Sample size determination. *The sample size was determined prior to any data analysis, and we followed a heuristic of 100 participants per condition based on the planned mediation analyses. Importantly, we expected an interaction between the currency condition (between-subjects) and the game condition (within-subjects) in all experiments. The sensitivity power analyses revealed that the minimum effect sizes of* $f = .09$ *(Study 1,* $N = 239$*),* $f = .10$ *(Study 2,* $N = 205$*), and* $f = .08$ *(Study 3,* $N = 406$*) could be detected under standard criteria; that is,* $\alpha = .05$ *two-tailed, power $= .80$, $r = 0.5$ (correlation among measures).*

Procedure and measures

After reporting basic demographic data, participants were informed that they were going to play two types of games for several rounds, each round with a different player. We told participants that all players had preregistered at our game website with their behaviour being systematically recorded (for a similar procedure, see Wang et al., 2018).

Participants then learned the DG's and UG's rules. For the DG, participants learned that dictators in the game were endowed with 100 points of money/candy that they could unilaterally split between another player (recipient) and themselves, while the recipients had to accept any offer that was made. For the UG, allocators were only able to propose how to divide the 100 points between another player (the recipient) and themselves. The recipients could then choose whether to accept or reject the proposed offer. If the recipient accepted the offer, the money/candy points would be split according to the proposal. If the recipient rejected the offer, then neither player would receive anything.

The decision whether participants acted as the allocator in the game was ostensibly determined by chance. To increase people's motivation towards the incentive, we emphasized that the money/candy points earned in the game would determine their chance of receiving an extra money bonus/candy gift voucher at the end of the experiment. The value of both rewards was well-matched, that is the money bonus and the candy box voucher equalled approximately $20. Although we did not mention the price of the candy box so as to avoid a mixed market mode (see Heyman & Ariely, 2004), participants were presented with an image of it (50 flavour gift box 600g by Jelly Belly®), which indirectly conveyed the respective value. Importantly, participants were told that the more they earned in the game, the more likely they would receive the money bonus/ candy voucher at the game's end (See 1 in Supporting Information).

After some comprehension checks,[2] participants repeatedly played the one-shot DG and UG in the allocator role. There were eight rounds for each game type. The order of the DG and UG was counterbalanced across participants. For each trial, a money/candy image (1,280 × 720 pixels) appeared in the centre of the screen to signal the start of a round. This was followed by a facial image (400 × 300 pixels) of their ostensible counterpart (see 2 in Supporting Information).

After seeing the counterplayer's facial image, a decision-making page prompted the participants to make their choice by deciding on a split of the 100 money/candy points between themselves and the counterpart, ranging from *100 for self (0 for the other)* to *0 for self (100 for the other)*, with increments of 10 points. Therefore, the allocation scores ranged from 0 to 100 points, with higher numbers corresponding to greater levels of generosity.

To measure individuals' motivation to maximize self-gain, participants indicated how much they were driven by the goal to maximize their own outcome on a 7-point Likert Scale (1 = *not at all*, 7 = *very much*, $M = 5.77$, $SD = 1.39$). To control for the possibility that responses were biased by their behaviour during the game, half of the participants answered this question before the start of the game, while the other half did so after they completed the game.

To rule out the possibility that effects were driven by the incentive type's desirability, participants' incentive motivation was assessed prior to starting the experiment on a 1-(*not at all*) to 7-(*very much*) point scale ($M = 5.74$, $SD = 1.43$) by asking how motivated

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[2] *Comprehension checks were used to help participants fully understand the rule of the game. For instance, 'Which of the following options is incorrect? I can allocate X money points to a receiver. . .Options: A. 0; B. 50; C. 100; D. 120'. Correct answer(s) were always presented right after participants made their choice first. The full list of checks can be found in Supporting Information.*

they would be by money (money condition)/candy (candy condition) in the game (for a similar procedure, see Wang et al., 2018).

Results and discussion

We calculated the generosity rates by averaging the scores across the eight rounds of each game (see 3 in Supporting Information) and submitted them to a 2 (game type: DG, UG) × 2 (currency condition: money, candy) mixed analysis of variance (ANOVA).

As predicted, there was a main effect of currency condition: participants in the money condition ($M = 29.5$, $SD = 12.4$) were less generous than participants in the candy condition ($M = 34.6$, $SD = 14.6$), $F(1, 237) = 8.45$, $p = .004$, $\eta_p^2 = .034$.

Also as predicted, there was a significant main effect of game type, $F(1, 237) = 315.68$, $p < .001$, $\eta_p^2 = .571$. On average, participants were more generous in the UG ($M = 42.3$, $SD = 11.9$) than the DG ($M = 21.8$, $SD = 20.1$), a result consistent with prior findings (e.g., Forsythe, Horowitz, Savin, & Sefton, 1994).

Central to the current study's claim, a significant interaction between the game type and the currency condition emerged, $F(1, 237) = 10.10$, $p = .002$, $\eta_p^2 = .041$ (see Figure 1). Although participants rated the money incentive ($M_{\text{money}} = 5.97$, $SD_{\text{money}} = 1.26$) as more desirable than the candy gift voucher ($M_{\text{candy}} = 5.52$, $SD_{\text{candy}} = 1.56$), $F(1, 237) = 5.91$, $p = .016$, $\eta_p^2 = .024$, the interaction effect between the game type and the currency condition remained significant when incentive motivation and its interaction with the currency condition were entered as covariates in the analysis, $F(1, 235) = 4.29$, $p = .039$, $\eta_p^2 = .018$.

Specifically, when candy was the game currency, participants in the DG were less generous than those in the UG ($M_{\text{DG}} = 26.2$, $SD_{\text{DG}} = 20.3$; $M_{\text{UG}} = 43.0$, $SD_{\text{UG}} = 12.9$), $F(1, 118) = 114.61$, $p < .001$, $\eta_p^2 = .493$. When money was the game currency, the difference was larger ($M_{\text{DG}} = 17.4$, $SD_{\text{DG}} = 19.1$; $M_{\text{UG}} = 41.6$, $SD_{\text{UG}} = 10.8$), $F(1, 119) = 204.97$, $p < .001$, $\eta_p^2 = .633$. In parallel, the generosity levels in the DG were significantly lower for those in the money than candy condition, $F(1, 237) = 11.88$, $p = .001$, $\eta_p^2 = .048$. This difference as a function of condition was not significant in the UG, $F(1, 237) = 0.87$, $p = .352$, $\eta_p^2 = .004$.

Mediation analysis using the PROCESS macro (Hayes, 2018; Model 4) revealed that there was an indirect effect of currency condition (money, candy) on flexible generosity (i.e., Generosity$_{\text{UG}}$–Generosity$_{\text{DG}}$) via the intention to maximize self-gain (see 4 in Supporting Information).

In summary, compared to candy, money impaired overall generosity, and people were more generous in the UG than in the DG. Crucially, such flexible generosity was more pronounced when money rather than candy served as currency. Money (compared to candy) reduced generosity in the DG to a greater extent than UG. This increased level of flexible generosity in the context of money was mediated by the motivation to maximize self-gain.

STUDY 2

Study 2 aimed to conceptually replicate and extend the findings of Study 1. To test the generalizability of our findings, we used food points in the control condition (rather than candy points) in the following studies. More importantly, we tested whether the impaired prosociality in the context of money could also be reduced when another egoistic motive was present, namely reputation building. In Study 2, instead of playing both games,
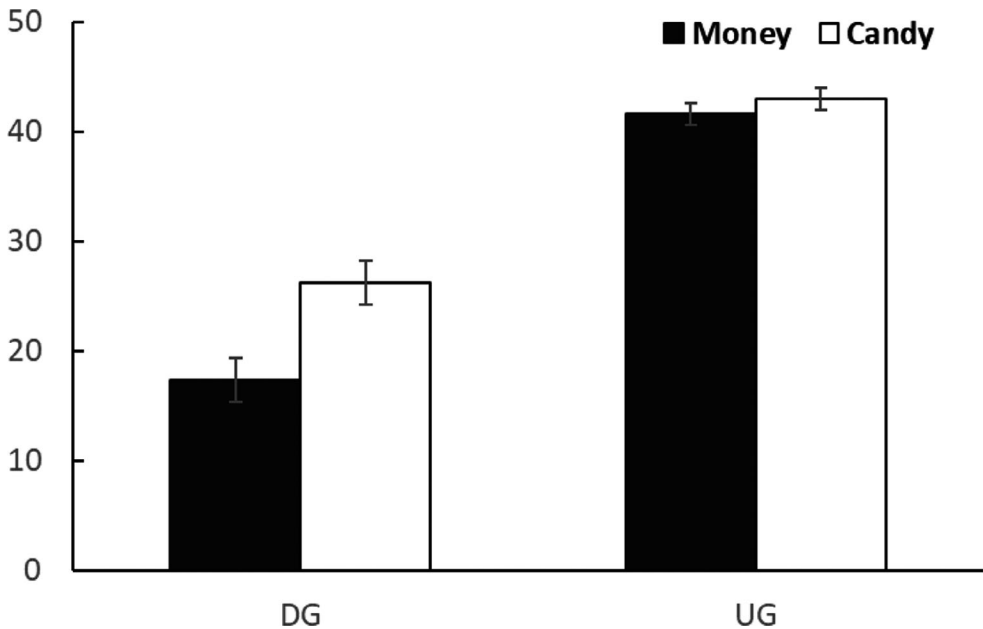
Figure 1. The generosity rates in the DG and UG as a function of the currency condition (Money vs. Candy) in Study 1. Error bars represent $\pm$ 1SE.

participants only played the DG in the allocator role. To allow participants to build their reputation, we manipulated whether their allocations were made in private (private condition) or in public (public condition). We predicted that (1) money, compared to food, as the currency would impair overall generosity; (2) people are more generous in the public than private condition, as people need to bear in mind the reputation they might acquire in the eyes of others who might retaliate in future rounds; crucially, (3) such flexible generosity would be more pronounced in the money than the food condition: money (compared to food) should impair generosity in the private condition to a greater extent than in the public condition; and (4) this increased level of flexible generosity in the context of money could be mediated by the motive to maximize self-gain.

Method

Participants and design
A total of 205 American participants (96 women, $M = 37.8$, $SD = 11.5$, 75% Caucasian, 9% African, 8% Asian, 8% others) from Mechanical Turk remained in the final analysis after excluding 18 participants who failed attention checks or screening questions.[3] The two-factor experimental design included the experimental currency condition (money vs. food) as a between-subjects factor and game condition (private vs. public) as a within-subjects factor. Participants were randomly assigned to one of the two currency

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[3] *The attention checks (e.g., Oppenheimer, Meyvis, & Davidenko, 2009) used included 'Colour or colour is the visual perceptual property corresponding in humans to the categories called red, blue, yellow, green and others. To answer the following question correctly, please always tick red no matter what your favourite colour really is. What colour do you like the most? Options: red, yellow, green, blue, silver, white, purple, black, grey, brown, pink, golden, other'. Regarding the screener question, we asked participants whether they had participated in the same/very similar studies before and excluded those who answered yes.*

conditions (approximately $N = 100$ people per condition). Participants received \$2 as compensation at the end of the study.

Procedure and measures

After reporting basic demographic data, participants were informed they were going to play two types of games for six rounds, each time with a different player. We told participants that all players had preregistered on our game website and that their behaviour was being systematically recorded (for a similar procedure, see Wang et al., 2018).

Participants then learned the general rules of the DG and also the two conditions of the game (i.e., private, public). As in Study 1, dictators in the game were endowed with 100 points of money/food they could unilaterally split between another player (recipient) and themselves, and the recipients had to accept any offer that was made. In the private game condition, participants learned that their decisions would remain anonymous, and that although recipients would be affected by their decisions, nobody would be able to determine their identity. However, in the public condition participants were made aware that their allocation pattern would be recorded and shown to a third party (another participant), who would act as the dictator in a subsequent round of the game in which participants themselves would be in the role of recipients. In particular, they were told that six additional rounds would take place at the very end. In these final six rounds, they would play with another six dictators (one at a time) who had observed their behaviour in the public condition rounds. For each round of the public condition, only one third party was ostensibly present.

The decision whether participants acted as the dictator in the game was ostensibly determined by chance. To increase people's motivation towards the incentive, we emphasized that the money/food points they earned in the game would determine their chance of receiving an additional money bonus (money condition)/a meal voucher (food condition) at the end of the experiment. The value of both rewards was well-matched (i.e., the money bonus and the meal voucher equalled approximately \$8). Although we did not mention the price of the lunch meal, participants were presented with an image of a typical McDonald's lunch meal, including a Big Mac® Meal, a chocolate Sundae, and an extra coffee, which indirectly conveyed the respective values.

After some comprehension checks (see Supporting Information), participants repeatedly played the one-shot DG in the dictator role, ostensibly each time with a different recipient. The order of the two game conditions (private and public) was counterbalanced across participants. For each trial, a money/food image ($1,280 \times 720$ pixels) appeared in the centre of the screen to signal the start of a round. This image was followed by a facial image (400×300 pixels) of their ostensible counterpart. To ensure the previous results were not specific to one gender, we extended the stimuli to include both men and women (see 5 in Supporting Information).

After seeing the counterplayer's facial image, a decision-making page prompted participants to make their choice by deciding how to split the 100 money/food points between themselves and their counterpart, ranging from *100 for self (0 for the other)* to *0 for self (100 for the other)*. Self-gain was measured using two questions, including '*How motivated are/were you to maximize your self-gain in this game?*' and '*How much are/were you driven by self-gain in this game?*' Half of the participants answered these questions before the game started and the other half did so after they completed the game.

An overall self-gain score was calculated by averaging the scores of the two items ($r = .82$, $M = 5.27$, $SD = 1.70$).

To control for the desirability of the incentive type, participants' incentive motivation was assessed after the experiment with three questions, including 'How motivated were you by the money bonus/food voucher in the game?'; 'How motivated are you by money/food in general?'; and 'Generally speaking, how desirable is money/food to you?' The responses were made on a 7-point Likert scale (1 = *not at all*, 7 = *very much*). An overall incentive motivation score was calculated by averaging the three items' scores ($\alpha = .86$, $M = 6.15$, $SD = 1.01$).

Results and discussion

Generosity rates were calculated by averaging the scores across the six rounds of each game condition (see 6 in Supporting Information) and then submitted to a 2 (game condition: private, public) × 2 (currency condition: money, food) mixed ANOVA (stimuli gender did not qualify the effects reported below, see 7 in Supporting Information).

As predicted, there was a significant main effect of currency condition, such that those in the money condition ($M = 27.5$, $SD = 15.2$) were less generous than those in the food condition ($M = 37.6$, $SD = 21.3$), $F(1, 203) = 15.54$, $p < .001$, $\eta_p^2 = .071$.

As predicted, there was a significant main effect of the game condition, $F(1, 203) = 116.03$, $p < .001$, $\eta_p^2 = .364$. On average, people were more generous in the public game condition ($M = 39.7$, $SD = 19.5$) than the private game condition ($M = 25.2$, $SD = 23.8$), indicating that people in general engage in flexible prosocial acts.

Central to the current study's claim, a significant interaction between the game condition and the currency condition emerged, $F(1, 203) = 42.06$, $p < .001$, $\eta_p^2 = .172$ (see Figure 2). Participants rated money and food as similarly desirable ($M_{money} = 6.23$, $SD_{money} = 0.86$; $M_{food} = 6.06$, $SD_{food} = 1.14$), $F(1, 203) = 1.38$, $p = .242$, $\eta_p^2 = .007$.

Specifically, people were less generous in the private than public condition when food was the game currency ($M_{private} = 34.8$, $SD_{private} = 24.4$; $M_{public} = 40.5$, $SD_{public} = 20.7$), $F(1, 99) = 14.30$, $p < .001$, $\eta_p^2 = .126$. This difference was larger when money was the game currency ($M_{private} = 16.0$, $SD_{private} = 19.3$; $M_{public} = 39.0$, $SD_{public} = 18.3$), $F(1, 104) = 112.64$, $p < .001$, $\eta_p^2 = .520$. In parallel, the generosity levels in the private game condition were significantly lower for those in the money condition than that of the food, $F(1, 203) = 37.66$, $p < .001$, $\eta_p^2 = .156$. This difference as a function of currency condition was not significant in the public game condition, $F(1, 203) = 0.30$, $p = .583$, $\eta_p^2 = .001$.

Further mediation analysis using the PROCESS macro (Hayes, 2018; Model 4) revealed that there was an indirect effect of currency condition (money, food) on flexible generosity (i.e., Generosity$_{public}$–Generosity$_{private}$) via the intention to maximize self-gain (see 8 in Supporting Information).

In summary, compared to food, money impaired overall generosity, and people were more generous in the public than private condition. Crucially, such flexible generosity was more pronounced when money rather than food served as currency. Money (compared to food) impaired generosity in the private condition to a greater extent than public condition. The motivation to maximize self-gain mediated this increased level of flexible generosity in the context of money.
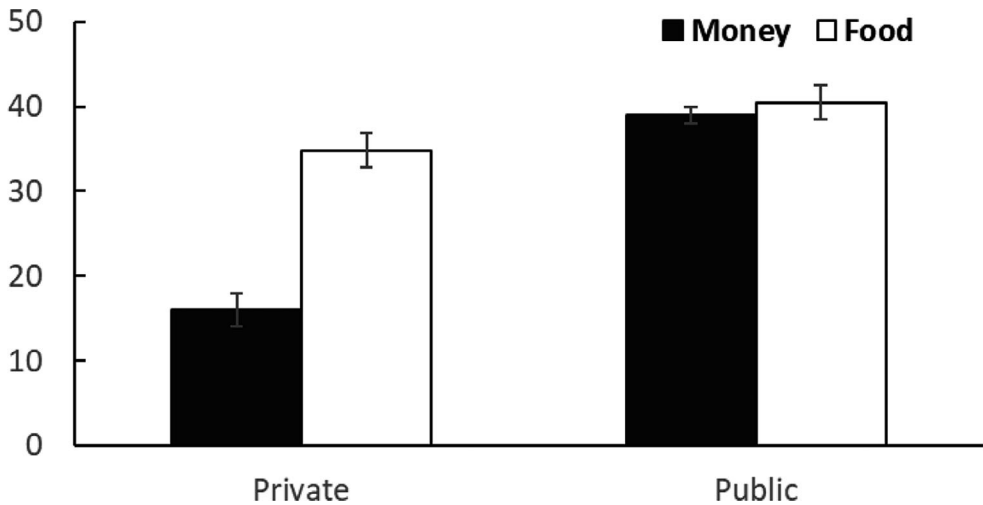
Figure 2. The generosity rates in the private and public DG as a function of the currency condition (Money vs. Food) in Study 2. Error bars represent ± 1 *SE*.

STUDY 3

Study 3 aimed to directly replicate Study 2 and, more importantly, to examine whether imbuing money with prosocial meaning (i.e., money to be donated to charities) could constitute a boundary condition for the effect of money on flexible prosociality. To this end, we used a 2 (currency condition: money, food) × 2 (target: self, charity) × 2 (game condition: private, public) design. To address potential limitations of Studies 1 and 2, Study 3 was conducted in a laboratory setting with a different sample, namely Chinese college students. We predicted a significant three-way interaction of currency, target, and game condition. Specifically, decomposing by target, (1) we expected to replicate the findings of Study 2 in the self-condition, namely a currency by game interaction such that flexible generosity (i.e., being less generous in the private than public condition) would be more pronounced in the money than the food condition. We expected this effect to be absent in the charity condition. Furthermore, decomposing by currency, (2) we expected that the level of flexible generosity would be higher in the self than the charity condition with money being the currency. We expected this effect to be less pronounced with food being the currency. (3) We predicted that although self-gain would mediate the effect of the currency condition on flexible generosity in the self-condition, self-gain would fail to be a significant mediator in the charity condition.

Method

Participants and design

A total of 406 Chinese participants (212 women, *M* = 21.6, *SD* = 2.37) were recruited from a university participant pool and remained in the final analysis after 19 participants who failed attention checks or did not finish the study were excluded. The three-factor experimental design included currency condition (money vs. food) and target (self vs. charity) as between-subjects factors and game condition (private vs. public) as a within-subjects factor. Participants were randomly assigned to one of the four between-subjects

conditions (approximately $N = 100$ per condition). Apart from their remuneration (i.e., 10 Chinese Yuan, approximately \$1.40 US dollars), participants in the self-condition were further compensated with 10 Chinese Yuan or a 10-Yuan bakery voucher (depending on currency condition), supposedly determined by the money/food points they had earned during the game. An equivalent amount of money or vouchers were donated to a local charity for those in the charity condition.

Procedure and measures

The study was conducted in a laboratory. The procedures were identical to those of Study 2, except for the following modifications. First, we added charity conditions (i.e., money charity and food charity conditions). Second, participants were made aware that the money or food points they earned in the game would be converted to money/food vouchers and given to themselves (self-condition) or donated to people working on the frontline of the COVID-19 pandemic response (charity condition; see 9 in Supporting Information). Third, we did not use any profile photographs (but only presented participants with counterplayers' number) so as to strengthen the anonymity of their interactions in a laboratory setting. Fourth, in the public condition, participants were made aware that their allocation pattern would be recorded and seen by other players on the platform. Finally, the private game was always presented before the public game.

We calculated a motivation to maximize self-gain score ($r = .66, M = 4.73, SD = 1.48$) and an overall incentive motivation score ($\alpha = .73, M = 5.50, SD = 0.92$) in the same way as in Study 2.

Results and discussion

Generosity rates were calculated by averaging the scores across the six rounds of each game condition (see 10 in Supporting Information) and then submitted to a 2 (game condition: private, public) × 2 (currency condition: money, food) × 2 (target: self, charity) mixed ANOVA.

Consistent with the previous studies, there was a trend that people on average were less generous when money ($M = 35.3, SD = 13.3$) rather than food ($M = 37.6, SD = 15.0$) was the game currency, $F(1, 402) = 2.90, p = .089, \eta_p^2 = .007$. In addition, people on average were less generous in the private ($M = 32.0, SD = 18.1$) than the public condition ($M = 41.0, SD = 13.4$), $F(1, 402) = 167.39, p < .001, \eta_p^2 = .294$ (see 11 in Supporting Information for other main effects and interactions not central to our hypotheses).

Central to the current study's claim, a significant interaction between game condition, currency condition, and target emerged, $F(1, 402) = 5.77, p = .017, \eta_p^2 = .014$. Participants on average rated money and food as similarly desirable ($M_{money} = 5.47$, $SD_{money} = 0.88$; $M_{food} = 5.54, SD_{food} = 0.95$), $F(1, 402) = 0.51, p = .475, \eta_p^2 = .001$. Although participants found incentives more desirable when they were for themselves, compared to when they were for charity ($M_{self} = 5.60, SD_{self} = 0.89$; $M_{self} = 5.40$, $SD_{self} = 0.93$), $F(1, 402) = 4.64, p = .032, \eta_p^2 = .011$, such target-driven difference did not vary as a function of the incentive type, $F(1, 402) = 0.15, p = .700, \eta_p^2 = .000$. More importantly, the interaction effect of game condition, currency condition, and target on generosity remained significant when incentive motivation and its interactions with the currency condition and target were entered as covariates in the analysis, $F(1, 399) = 5.53$, $p = .019, \eta_p^2 = .014$.

Specifically, when the target was self, the interaction between the game condition and currency was significant, $F(1, 198) = 8.88$, $p = .003$, $\eta_p^2 = .043$ (see Figure 3). People were less generous in the private than public condition when food was the currency ($M_{\text{private}} = 32.2$, $SD_{\text{private}} = 17.6$; $M_{\text{public}} = 40.2$, $SD_{\text{public}} = 12.9$), $F(1, 104) = 32.83$, $p <.001$, $\eta_p^2 = .240$. This difference was larger when money was the currency ($M_{\text{private}} = 27.0$, $SD_{\text{private}} = 17.6$; $M_{\text{public}} = 41.4$, $SD_{\text{public}} = 10.8$), $F(1, 94) = 76.26$, $p <.001$, $\eta_p^2 = .448$. In parallel, the generosity levels in the private game condition were significantly lower for those in the money compared to the food condition, $F(1, 198) = 4.33$, $p = .039$, $\eta_p^2 = .021$. This difference was not significant in the public game condition, $F(1, 198) = 0.52$, $p = .473$, $\eta_p^2 = .003$, replicating Study 2. In contrast, when the target was charity, the interaction between the game condition and currency was not significant, $F(1, 204) = 0.04$, $p = .840$, $\eta_p^2 = .000$.

In parallel, when money was the currency, the interaction between game condition and target was significant, $F(1, 198) = 13.68$, $p < .001$, $\eta_p^2 = .065$. People were less generous in the private than public condition in the self-condition ($M_{\text{private}} = 27.0$, $SD_{\text{private}} = 17.6$; $M_{\text{public}} = 41.4$, $SD_{\text{public}} = 10.8$), $F(1, 94) = 76.26$, $p < .001$, $\eta_p^2 = .448$. This difference was smaller in the charity condition ($M_{\text{private}} = 32.8$, $SD_{\text{private}} = 17.4$; $M_{\text{public}} = 39.7$, $SD_{\text{public}} = 13.6$), $F(1, 104) = 30.51$, $p < .001$, $\eta_p^2 = .227$. This suggests that imbuing money with prosocial meaning could be the boundary condition for the effect of money on flexible prosociality. The generosity level in the private game condition was significantly lower for those in the self-condition ($M = 27.0$, $SD = 17.6$) than that of the charity ($M = 32.8$, $SD = 17.4$), $F(1, 198) = 5.53$, $p = .020$, $\eta_p^2 = .027$. This difference was not significant in the public game condition, $F(1, 198) = 0.97$, $p = .326$, $\eta_p^2 = .005$. In contrast, when food was the currency, the interaction between the game condition and the target was not significant, $F(1, 204) = 0.16$, $p = .692$, $\eta_p^2 = .001$ (see Figure 3).

Moderated mediation analysis using the PROCESS macro (Hayes, 2018; Model 7) revealed that there was an indirect effect of interaction between currency condition and target on flexible prosociality (i.e., Generosity$_{\text{public}}$–Generosity$_{\text{private}}$) via the intention to
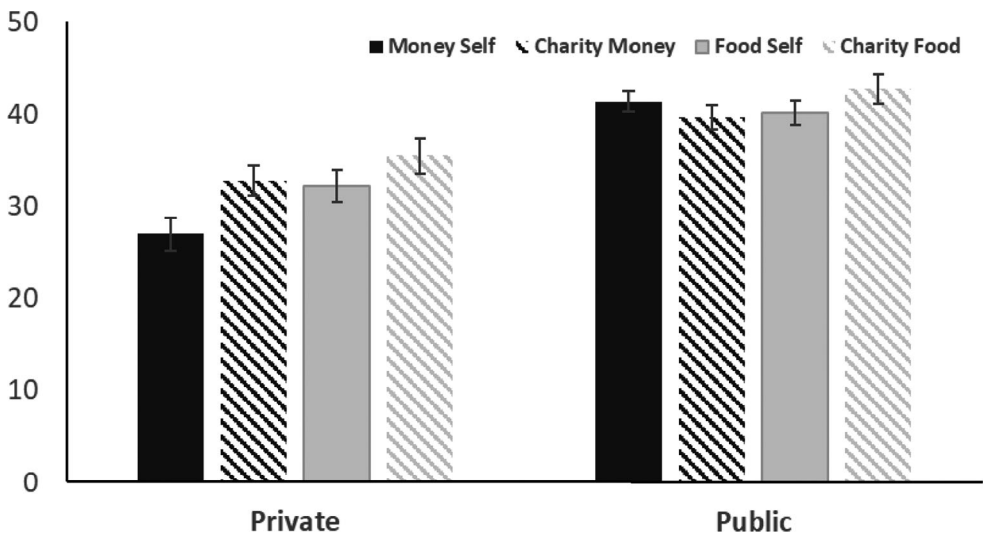

Figure 3. The generosity rates in the private and public DG as a function of currency condition (Money vs. Food) and target (self vs. charity) in Study 3. Error bars represent $\pm$ 1 *SE*.

maximize self-gain (see 12 in Supporting Information). Specifically, in the self-condition, there was an indirect effect of currency condition on flexible generosity via the intention to maximize self-gain, replicating Study 2. However, this was not the case in the charity condition.

In summary, Study 3 replicated the findings of Study 2. In addition, we showed a boundary condition for the effect of money on flexible generosity, namely imbuing money with prosocial meaning.

GENERAL DISCUSSION

Previous research on money and prosociality has described a monotonic pattern, consistently showing that money reduces generosity (e.g., Gasiorowska et al., 2016; Roberts & Roberts, 2012). The current research extended these findings by showing that money does not impair all types of generosity to the same extent.

In Study 1, we showed that money impaired generosity in the DG where no possible sanction was expected, but not in the UG, where acting in an ungenerous manner could entail punishment. This finding was conceptually replicated in Study 2: money reduced participants' generosity level in the DG private condition where no possible sanction was expected, but not in the public condition where one's negative reputation could entail retaliation. This finding was directly replicated in Study 3 when the game included gains for the self. Interestingly, Study 3 further showed that giving prosocial meaning to money by making participants donate their earnings from the game to a charity was a boundary condition for the effect of money on flexible prosociality. In addition, the increased flexible prosociality (i.e., different generosity levels facing varied games or game conditions) when money was the game currency was accounted for by people's motive to maximize self-gain across all studies.

These findings have important theoretical and practical implications. Consistent with the findings on the detrimental effects of money, such as fostering self-serving and unethical behaviour (for a review, see Wang et al., 2020), we revealed that when others were not crucial for their future gain, participants in the money condition tended to ignore them. That is, compared to those in the candy/food condition, participants in the money condition were less likely to share when others had no impact by means of potential retaliation (DG, Study 1) or by tarnishing their reputation (private condition, Studies 2 and 3). This is in line with the general view that money increases self-centredness by excluding others from consideration (e.g., Mead & Stuppy, 2014; Wang & Krumhuber, 2017; Zaleskiewicz, Gasiorowska, & Vohs, 2017).

Crucially, when egoistic motives were the driving force for generosity, namely an interaction partner co-determining participants' material gain (UG, Study 1), or a third party observing participants' behaviour (public condition, Studies 2 and 3), the inhibited prosociality brought about by money reduced or even disappeared. This finding suggests that money makes people adopt an instrumental approach when it comes to prosociality. It is also in line with previous studies showing that people in a monetary mode tend to use others as a means to maximize personal goal achievement (e.g., Teng, Chen, Poon, Zhang, & Jiang, 2016; Wang & Krumhuber, 2017). Our findings suggest that if appropriate rules are imposed (e.g., through sanctions or by linking prosocial act with one's reputation), the adverse effects of money on prosociality can possibly be reduced or even disappear. As such, they shed light on the real-world phenomena, such as donations made by average citizens and corporations for reputation building and tax reductions.

Interestingly, we found that people are generally inclined to engage in flexible generosity. People's generosity levels were significantly higher in the UG than the DG (Study 1), and in the public than private condition (Studies 2 and 3). These findings are in line with the central assumption of economics that individuals' behaviours are guided by self-interest. Importantly, money heightened such a self-maximization motive that led to an increased level of flexible generosity (Studies 1–3). In addition, in line with prior findings on prosocial spending (i.e., spending money on others; Aknin, Barrington-Leigh, Dunn, et al., 2013; Dunn, Aknin, & Norton, 2008; Whillans, Dunn, Sandstrom, Dickerson, & Madden, 2016), we showed that shifting people's focus away from themselves and personal gain by imbuing money with prosocial meaning reduces such flexible prosociality.

Limitations and future avenues

In the current research, the overall generosity level was reduced when money (vs. candy/food) was the game currency. This conceptually replicated a number of previous studies (e.g., Gasiorowska et al., 2016; Gąsiorowska & Hełka, 2012; Vohs et al., 2006), but seemed to be inconsistent with the results by Sorokowski et al. (2017) who did not find differences in generosity when money or food served as game currency. One possibility is that the amount of money shared was rather small in that study. In contrast, money in our case was treated as an abstract concept (i.e., money points). Future research could further examine whether the amount of money (large vs. small) and/or whether the actual reward is directly related to participants decisions influences overall generosity as well as levels of flexible prosociality.

In addition, we demonstrated that impaired prosociality in monetary contexts reduced when egoistic motives were present. Such motives were exampled by avoiding sanctions and reputation building, both of which entail interdependence. As such, an interaction partner (UG) or observing others (public condition) could impact participants' gain immediately or in the future. Future studies could test whether other egoistic reasons, such as a public display of one's economic power or reducing guilt, lead to similar effects.

Furthermore, in testing boundary conditions, participants in the current research earned money either for themselves or for a charity (Study 3). Future studies could examine if a similar effect as found here would emerge even if the money was for another person (e.g., general others) rather than for someone in need (e.g., charity). In addition, although we showed that self-gain could account for the effect of money on flexible generosity, future studies could examine other potential mediators in this process, such as objectification (i.e., perceiving and treating a benefit recipient as a tool to facilitate personal goal attainment).

In summary, previous research on money and prosociality described a monotonic pattern, showing that money reduces generosity. The present research demonstrated that money impaired generosity that arises from altruistic versus egoistic motives differently. Money made people ignore others when those others were not crucial for their future gain, and generosity was not impacted when egoistic reasons (Study 1: avoiding sanctions; Studies 2 and 3: building reputation) were the driving force. In addition, we demonstrated a boundary condition of money on flexible generosity: imbuing money with prosocial meaning (Study 3).

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Conflicts of interest

The authors have no conflict of interest.

Author contributions

Xijing Wang (Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Writing – original draft; Writing – review & editing) Zhansheng Chen (Conceptualization; Funding acquisition; Writing – original draft; Writing – review & editing) Eva Krumhuber (Conceptualization; Methodology) Hao Chen (Data curation; Investigation; Project administration; Writing – review & editing)

Data availability statement

For all studies, anonymized data, data analysis scripts, and Supporting Information are freely available: https://osf.io/bkvdm/?view_only=84394983c3da4abdbf439980c1e1064c

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Supporting Information

The following supporting information may be found in the online edition of the article:

Figure 1SM. The mediation model for the effect of currency condition (money vs. candy) on flexible generosity via self-gain, with β and p values after controlling for the mediator shown in parentheses, Study 1.

Figure 2SM. The mediation model for the effect of currency condition (money vs. food) on flexible generosity via self-gain, with β and p values after controlling for the mediator shown in parentheses, Study 2.

Figure 3SM. The moderated mediation model for the interaction between currency condition (money vs. food) and target (self vs. charity) on flexible generosity via self-gain, with β and p values after controlling for the mediator shown in parentheses, Study 3.