The Impact of Self-Depletion on Altruism in the Loss Situations

Liangyu Liu[a,*], Jiaxiong Ma[b]

School of Psychology, Jiangxi Normal University, Nanchang, China

[a] Luke_psy2210@sina.com, [b] 2630795359@qq.com

*corresponding author

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Abstract: The current research applies Stroop task and the variants of Dictator game to investigate the effects of loss situations and self-depletion on individual altruistic behavior. The result shows that the altruistic behavior of individuals in the loss situations was influenced by self-control resources and the self-depleted individuals' altruistic levels significantly declined; Loss situations further deepened the degree of individual self-depletion, thus the level of altruism was lower than the gain situations. Our research confirms the idea that individuals' altruistic behavior in the loss situations is deliberately controlled by the rational system, given that loss situations can accelerate the consumption of self-control resources. The current research aims at further investigating the nature of human altruism.

1. Introduction

Altruism is a socially recognized good behavior. The so-called altruism refers to a behavior in which individuals sacrifice their own interests to other's benefits, regardless of whether or not they might get anything in return. The question about whether altruism has been a human innate instinct or an acquired behavior has always been a controversial debate.

Although some viewers believe that altruism is a human instinct, it is also intuitive and implicit. Yet deeper researches establish that altruism is not a human instinct, but an autonomous behavior controlled by subjective consciousness governed by self-control resources [1]. Self-depletion does not only increase the occurrence of immoral behaviors, but also reduce the probability of prosocial behaviors (such as altruism). From the perspective of the dual system approach, human instincts may be egocentric, while altruism is likely to be the result of self-controlled individual rational systems.

Nevertheless, most of the previous studies focused on the gain situations, and only few studies tackled the altruistic individual behavior based on the loss situations. Studies of framing effects and risk preference suggest that individuals have a preference for loss aversion. The damage caused by the loss is far greater than the happiness brought by the same gain. Studies propose that loss aversion is a natural psychological characteristic of human beings[2], and it is an instinctive expression of human beings' advantage and a basic neurologic feature that evaluate possible outcomes. So do the loss situations affect the individual's experimental performance in the dictator game task?

This study intends to further explore the impact of self-depletion on individual altruism in the loss situations. Let's assume that, firstly, altruism may be a rational activity that requires more self-control resources, so a decrease in self-control resources reduces individual altruism, and the loss situations may exhibit the same self-depletion effects as the gain situations. Next, considering the particularity of the loss situations itself, which induce individual loss aversion[3], the decrease in self-control resources may further highlight the individual's intuition, showing an increasing trend of egoism.

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2. Method

2.1 Participants

126 undergraduates from Jiangxi Normal University were recruited, comprising of 36 males, 90 females, with the age average and standard deviation being 18.48 years and 0.89, respectively. The participants had normal visual acuity or properly corrected vision, no color blindness, and no previous participation in similar experiments.

2.2 Experimental Design

3. (Degree of Self-Depletion: High Self-Depletion, Low Self-Depletion)×2 (Decisive Context: Context of Gain, Context of Loss), Two-Factor Mixed Design.

3.1 Experimental Materials

This study uses dual-task paradigms to manipulate self-losses. It is the classic paradigm of self-depletion research. The basic logic is that the self-control process of the previous task consumes limited resources and affects subsequent self-control tasks[4].

3.1.1 Stroop Task

The adapted Stroop task was used to induce individual self-depletion. The experimental materials for this task are the four Chinese characters “red”, “yellow”, “blue”, and “green” written in four colors: red, yellow, blue, and green. Divided into two types of stimuli whose color is consistent with the meaning of the word or not. Stroop missions were compiled using E-prime 2.0 and the single trial experiment process is shown in Figure1

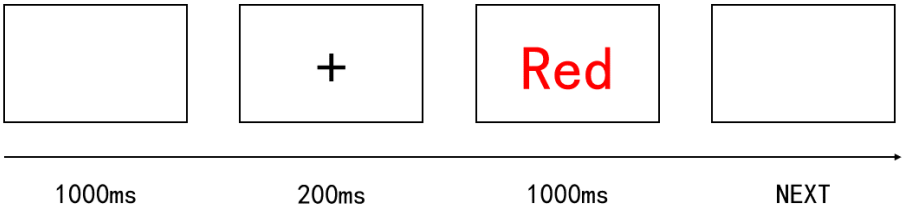

Fig.1 Single Stroop Task Experiment Process

3.1.2 Altruism Level Test

Based on the dictator's game task, the current experiment sets up two different situations of gain and loss. The task was divided into two blocks. A 30s rest period was provided between block1 and block2. The order of block presentation was balanced among the participants. There were 8 trials per block, including 4 gain situations trials and 4 loss situations trials. The trials presentation order was randomized. The single experimental trial process is shown in Figure 2.

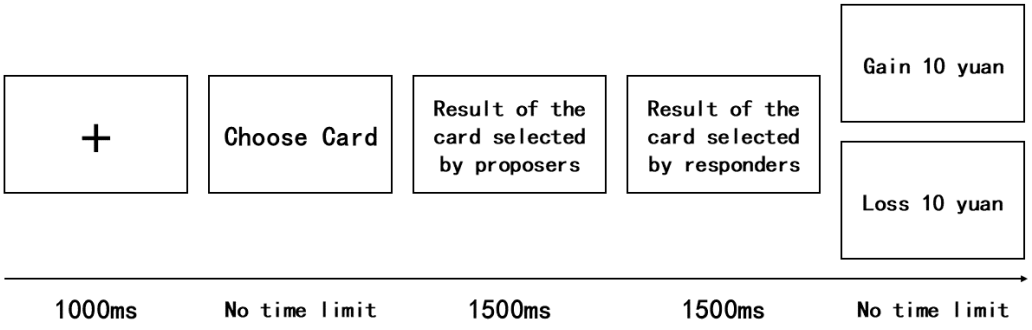

Fig.2 Experimental Process of a Single Dg Task

4. Results

Using the level of altruism in DG as the dependent variable, two-way repeated measures anova were performed. The results show that the main effect of the gain and loss situations was significant, $F(1,124) = 17.99$, $p<0.01$, $\eta^2 = 0.13$, and the level of altruism in the loss situations was significantly lower than in the gain situations; The main effect of the degree of self-depletion was significant, $F(1,124) = 47.23$, $p<0.01$, $\eta^2 = 0.28$, and the altruism level with high self-depletion was significantly lower than that with low self-depletion; The interaction effect between the gain and loss situations with the degree of self-depletion was significant, $F(1,124) = 7.31$, $p<0.01$, $\eta^2 = 0.06$.

A further simple effect analysis of the interaction effect revealed that under the gain situations, the level of altruism with high self-depletion was significantly lower than those with low self-depletion, $F(1,124) = 14.27$, $p<0.01$, $\eta^2 = 0.10$; In the loss situations, the level of altruism with high self-depletion was also lower than that with low self-depletion significantly, $F(1,124) = 41.43$, $p<0.01$, $\eta^2 = 0.25$, which indicates that the loss situation was the same as the gain situation and individuals showed lower levels of altruism when self-control resources collapsed.

Table 1 Altruistic Levels With High / Low Self-Depletion in Gain-Loss Situations

Gain and Loss situations	Degree of Self-depletion	Altruism level (M ± SD)
Gain situations	High self-depletion	4.30±0.09
	Low self-depletion	4.78±0.09
Loss situations	High self-depletion	3.68±0.11
	Low self-depletion	4.64±0.11

On the other hand, there is no difference between the level of altruism in the gain and loss situations under low self-depletion conditions ($p>0.05$). However, the level of altruism in the loss situations and the gain situations is significantly different under high self-depletion conditions ($p<0.01$), and the level of altruism in the loss situations is significantly lower than that in the gain situations ($p<0.01$).

5. Discussion

This study uses the Stroop task to change the self-depletion status. Through the experimental performance of individuals' money allocation tasks in the adapted DG task, it examines the effect of the loss of self-control resources on individual altruistic behavior in the loss situations. Our research found that individuals' altruistic behavior in the loss situations is still affected by self-control resources. Meanwhile, compared with the gain situations, the self-depletion effect suffered by the individual in the loss situations is further deepened.

Current research found that the altruism level of self-depleting individuals is significantly reduced in the gain situation, which is consistent with previous research results[5]. Moreover, the current research also found that the altruism level of self-depleting individuals was also significantly reduced in the loss situations, which are consistent with our experimental expectations. Our results suggest that individuals are more inclined to be altruistic in the loss situations, and to some extent support individuals' altruistic behavior in the loss situations based on the self-control of rational systems[6].

The level of altruism in self-depleting individuals in the loss situations is significantly lower than that in the gain situations. Behavioral economics studies confirm that individuals' emotional experiences are different in gain and loss situations, and loss situations are often perceived as a negative event, which can activate negative emotions-related brain regions such as the thalamus and dorsal striatum and trigger an individual's negative emotional experience. Once negative emotions occur, the individual tries to suppress them. Emotion modulation theory believes that controlling an emotional response requires the consumption of certain self-control resources and may cause self-depletion. Related research also shows that negative emotions can accelerate the failure of self-control and affect the performance of subsequent tasks. Therefore, in order to overcome the negative emotions induced by the loss situations, the individual will consume additional self-control

resources, resulting in a greater degree of self-depletion in the loss situations than in the gain situations, making the level of altruism in the loss situations significantly lower than the gain situations.

Intuitively, altruism is not an adaptive choice. Individuals can maximize their own interests by storing and retaining resources, and helping others is often accompanied by the consumption of their own resources. Compared with altruism, egoism obviously has greater genetic value and biological adaptability value. Current research tends to believe that individuals' behaviors in the face of losses are more based on instinctual considerations of egoism. Yet still, there must be a potential risk behind prosocial behavior. That individuals exhibit altruistic behavior means one-way payment of resources such as time, energy, and money. The tangible loss is painful and disgusting[7]. When individuals face situations such as DG tasks that pay close attention to core interests and always emphasize the gains and losses of their own interests, the individual's instinctive egoism preferences will overcome the altruistic preferences expected from the outside world, and then show egoistic behavior.

6. Conclusion

This research suggests that: (1) the individual's altruistic behavior in the loss situations is affected by self-control resources. When an individual is in a state of self-depletion, due to the lack of self-control resources, the internal impulse of egoism cannot be suppressed, displaying less altruism; (2) the loss situation exacerbates the individual’s degree of self-depletion and thus shows less altruism. Compared with the gain situations, the individual's self-depletion is further deepened in the loss situations, making people more inclined to exhibit egoistic behavior.

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