The Effect of Social Value Orientation on Third-Party Altruistic Behavior in 10-12-Year-Old Children: The Role of Emotion (Postprint)

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Abstract

To explore the relationship between social value orientation and third-party altruistic behavior in children aged 10-12, Experiment 1 adopted the third-party punishment paradigm, recruiting 233 child participants, and Experiment 2 adopted the third-party compensation paradigm, recruiting 238 child participants, to examine the effects of social value orientation and emotion on third-party altruistic behavior under three distribution conditions (highly unfair, moderately unfair, and fair), and to compare the results of the two experiments. The results showed: (1) In the third-party punishment task, prosocial children (compared to pro-self) contributed more coins to punish the allocator under highly unfair conditions; (2) In the third-party compensation task, prosocial children (compared to pro-self) contributed more coins to compensate the recipient under both unfair conditions; (3) Emotion only mediated the relationship between social value orientation and third-party altruistic behavior under highly unfair conditions; (4) Children who adopted third-party compensation (compared to third-party punishment) showed less emotional fluctuation when facing different distributions and exhibited more altruistic behavior under moderately unfair conditions. These findings provide developmental evidence for the influence mechanism of social value orientation on third-party altruistic behavior, highlighting the important role of prosocial orientation in maintaining social fairness.

Full Text

Preamble

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The Effect of Social Value Orientation on Third-Party Altruistic Behaviors in Children Aged 10–12 Years: The Role of Emotion

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Abstract

Fairness plays a critical role in maintaining social order. To understand fairness development, numerous studies have examined children's upholding fairness behaviors, such as resource allocation. In particular, the emergence of third-party altruism in Chinese children at the age of 8–10 is an important turning point in fairness development. Third-party altruism refers to the behavior of individuals voluntarily paying costs to punish violators, which is a form of prosocial behavior. Most previous studies have confirmed that social value orientation (SVO) affects prosocial behaviors, and some cognitive neuroscience studies have found that SVO and emotion together affect prosocial behaviors. However, we do not know the specific mechanisms by which children's SVO and emotions affect their third-party altruistic behaviors. Additionally, because third-party altruism can adopt punishment and compensation, the mechanisms may be different. Therefore, through two experiments, this study aimed to investigate the mechanisms of children's SVO and emotion on third-party altruism and the difference between children's third-party punishment and compensation behaviors in three offer conditions (i.e., high inequality, moderate inequality, and equality).

Experiment 1 was based on the third-party punishment task and aimed to investigate the effect of children's SVO on their emotion and punitive behaviors and to verify the mediating role of emotion. We recruited 233 children aged 10–12 years. After completing the demographic information, they were instructed to complete three third-party punishment tasks revised from the dictator game. The proposer in the dictator game offered one, three, and five coins from 10 coins to the recipient successively. As the third party, children reported the level of pleasure and decided whether to spend any integer of their endowed five coins to punish the proposer in each task. For every coin spent, two coins were deducted from the proposer's endowment. The results revealed that prosocial children (vs. the pro-self) were more unpleased and spent more coins to punish the proposer, and emotion played a mediating role in the relationship between SVO and third-party punitive behaviors in the high inequality condition but

not in the moderate inequality or equality conditions.

To deeply understand children's third-party altruistic behaviors and compare the two kinds of behaviors, we conducted Experiment 2 based on the third-party compensation task. We recruited 238 children aged 10–12 years. The experimental procedure was similar to that of Experiment 1, except that children in Experiment 2 spent coins to compensate the recipient rather than punish the proposer. The results revealed that prosocial children (vs. the pro-self) spent more coins to compensate the recipient in the high and moderate inequality conditions; emotion played a mediating role in the relationship between SVO and third-party compensation behaviors only in the high inequality condition. As for the difference between the two kinds of third-party altruistic behaviors, children in the third-party compensation (vs. punishment) task had less emotional fluctuation when confronted with three offers and spent more coins to maintain a fair order in the moderate unequal condition.

These findings suggest that SVO had a stable effect on third-party punishment and compensation in 10- to 12-year-old children under all three offer conditions, and that emotion mediated the relationship between SVO and each kind of third-party altruistic behavior when children were confronted with an extremely unfair offer. Additionally, the children showed different levels of pleasure and behavior in the two third-party altruistic tasks. Our study contributes to revealing the mechanisms of SVO and emotion on two kinds of third-party altruistic behaviors and suggests that prosocial orientation is a critical factor in fostering children's third-party altruism.

Keywords: social value orientation, third-party punishment, third-party compensation, inequality aversion, emotion, children

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1.1 Children's Third-Party Altruistic Behaviors

Third-party altruism refers to the behavior of individuals who, as uninvolved bystanders whose own interests are not affected, voluntarily pay costs to punish violators (Fehr & Fischbacher, 2004) or compensate victims (Hu et al., 2015; Leliveld et al., 2012). This behavior not only helps individuals establish good interpersonal interactions in complex social situations but also maintains social norms, making it an important form of prosocial behavior. As one of the most important social norms, fairness helps promote group cooperation and maintain a good social order, and is a topic of great importance in psychology, education, economics, sociology, and other fields. To understand the origin and development of fairness maintenance in humans, numerous studies have examined fairness behaviors in children at different developmental stages (e.g., McAuliffe et al., 2017) and found that children in early childhood avoid disadvantageous inequality (receiving less than others) (Blake et al., 2015). By middle childhood, they avoid both self-relevant unfairness (second-party punishment) (Gummerum & Chu, 2014) and self-irrelevant unfairness (third-party punishment) (McAuliffe

et al., 2015). By late childhood, they begin to avoid advantageous inequality (receiving more than others) (Blake & McAuliffe, 2011). Thus, the emergence of third-party altruistic behavior indicates that children in middle childhood (ages 6–11) have transitioned from "adhering to fairness principles for oneself" to "adhering to fairness principles for both self and others" (McAuliffe et al., 2017), representing an important turning point in the development of children's fairness behaviors.

Given the importance of third-party altruistic behavior for children's development and social adaptation, it is necessary to deeply understand the formation mechanisms of third-party altruistic behavior in this developmental stage. Therefore, this study selected children aged 10–12 as participants. Children aged 10–12 are not only at an important turning point in the development of fairness behavior but also at a critical life transition point before adolescence. Investigating this developmental stage can provide empirical guidance for fostering stable third-party altruistic tendencies in late childhood.

Third-party punishment is one form of third-party altruistic behavior, referring to individuals voluntarily paying costs to punish violators, a unique social action that distinguishes humans from other animals (Guo et al., 2016). Previous research has shown that even infants exhibit third-party punishment tendencies. For example, Meristo and Surian (2014) used a looking-time paradigm and found that 10-month-old infants expected fair allocators and unfair allocators to be treated differently. Further research has found that 2-year-old children already show a tendency to reward and punish clearly (Hamlin et al., 2011), and 3-year-old children make verbal condemnations of moral transgressors (Vaish et al., 2011), indicating that they can not only distinguish between prosocial and antisocial behaviors but also treat them differently behaviorally. McAuliffe et al. (2015) found that 6-year-old children can make systematic and selective interventions against fairness norm violations, whereas 5-year-old children's behavior patterns are still unclear. Other studies have also confirmed that 6- to 8-year-old children are more willing to make costly punishments as third parties (Gummerum & Chu, 2014; Jordan et al., 2016). In summary, children generally develop stable third-party punishment behavior around middle childhood, and this conclusion is basically consistent with findings from domestic researchers. Liang et al. (2015) confirmed that the turning point for Chinese children's fairness concepts occurs at ages 8–10, meaning that after age 8, they adhere to fairness principles for both self and others, showing altruistic tendencies.

In addition to third-party punishment, third-party altruistic behavior has another form: third-party compensation (Leliveld et al., 2012). Third-party compensation refers to individuals voluntarily paying costs to compensate victims. Although third-party compensation is also an altruistic option for bystanders and has equal importance for maintaining fairness norms, few studies have examined third-party compensation behavior (Chavez & Bicchieri, 2013), and even fewer have directly examined children's third-party compensation behavior. Existing studies have experimentally examined children's preferences for

the two types of third-party altruistic behaviors and found that children prefer to use third-party compensation to maintain fairness rather than third-party punishment (Lee & Warneken, 2020). This finding has also been confirmed in real-world situations (Lee et al., 2022). More studies have examined adults' preferences for third-party altruistic behaviors but have not reached consistent conclusions. Some studies, consistent with children's research, found that third-party compensation is more preferred (Chavez & Bicchieri, 2013; Hu et al., 2016; Leliveld et al., 2012), while others reached opposite conclusions (Stallen et al., 2018). However, both adults and children evaluate third-party compensation more positively than third-party punishment (Dhaliwal et al., 2021; Jordan et al., 2016; Raihani & Bshary, 2015). Lee and Warneken (2020) pointed out that children have higher evaluations of third-party compensators because they tend to view them as generous and compassionate, while viewing third-party punishers as aggressive.

In addition to comparing the two third-party altruistic behaviors from the perspective of preferences and evaluations, some studies have also pointed out differences and similarities between the two behaviors from a neurobiological perspective. Although third-party punishment and third-party compensation have similar cognitive neural foundations (Hu et al., 2015; Stallen et al., 2018), both activating the bilateral striatum, the specific networks mobilized differ (Guitart-Masip et al., 2014; Hu et al., 2015). Third-party punishment activates the left lateral prefrontal cortex and ventromedial prefrontal cortex, while third-party compensation activates the right lateral prefrontal cortex.

Overall, although previous studies have noted differences in children's preferences and evaluations of the two third-party altruistic behaviors, these studies have not directly examined children's own third-party altruistic behaviors. Therefore, we do not know whether children's preference for third-party altruistic behaviors is reflected in actual behavior under the same allocation situation. A deep examination of whether 10–12-year-old children's preferences for third-party altruistic behaviors are manifested in actual behavior is conducive to understanding their characteristics as third-party prosocial behavior and guiding children who have just formed altruistic tendencies to more actively maintain social norms. Existing relevant studies on adults simultaneously provide two third-party altruistic options for bystanders to choose from to maintain fairness, so bystanders may be influenced by the choice situation (Jordan et al., 2016). That is, in this optional situation, people who still choose to punish rather than compensate may appear very aggressive rather than well-intentioned. To avoid this influence, this study separately set up two experiments—third-party punishment and third-party compensation—to examine children's emotions and behaviors when using third-party punishment and third-party compensation separately under the same allocation situation. Given the scarcity of relevant research, this study only hypothesizes that different available third-party altruistic methods would result in differences in children's emotions and behaviors, without making specific predictions.

1.2 The Relationship Between Social Value Orientation and Third-Party Altruistic Behaviors

Third parties who make altruistic behaviors consider the interests of others and sacrifice their own interests to pursue equality of outcomes. Therefore, third-party altruistic behavior is regarded as prosocial behavior that maintains fairness and social order (Fehr & Fischbacher, 2004; Fehr & Gächter, 2002; Ginther et al., 2016). Numerous studies have confirmed that social value orientation (SVO) is closely related to prosocial behaviors, including altruistic behavior (Qi et al., 2017; Zhang et al., 2014). Social value orientation refers to individuals' specific preferences for distributing self and others' interests in interdependent situations, a relatively stable personality tendency typically divided into prosocial orientation and pro-self orientation (Hong et al., 2012). Pro-self individuals pursue maximization of self-interest and do not care about others' interests in social dilemmas, while prosocial individuals pursue maximization of joint interests and minimization of interest differences (Qi et al., 2017). Van Lange et al. (1997) pointed out that SVO is rooted in individuals' interactive experiences with their primary caregivers, shaped by social interaction patterns from early childhood to adolescence, and also influenced by social experiences in adulthood and even old age. Li et al. (2013) pointed out that Chinese adolescents only form stable SVO at age 14, and behavior at this time can reflect their SVO.

Although previous studies have confirmed that SVO affects decision-making, few have examined the effect of SVO on the two types of third-party altruistic behaviors. Meanwhile, considering that 10–12-year-old children are in the initial stage of altruistic behavior formation (McAuliffe et al., 2017; Liang et al., 2015) and their SVO is still not stable (Li et al., 2013), understanding the relationship between the two can provide empirical support for educators to better guide children in forming stable prosocial orientations. Therefore, it is more necessary to examine the effect of SVO on third-party punishment and compensation behaviors. Given that individuals with different SVOs show different reactions when facing unfair proposals (Karagonlar & Kuhlman, 2013), this study focuses on how 10–12-year-old children's SVO affects third-party altruistic behavior when they see fair and unfair allocation proposals, and hypothesizes that SVO and allocation fairness interactively affect children's third-party altruistic behavior. That is, when facing unfair proposals, prosocial children make more third-party punishment and compensation behaviors than pro-self children.

1.3 The Mediating Role of Emotion

Third-party altruistic behavior is also driven by emotion (Civai et al., 2010; Fang & Chen, 2011; Wu et al., 2022). Chen et al. (2015), based on social norm activation theory (Schwartz, 1977), pointed out that when third parties see social norms being violated, their social norms are activated at both cognitive and emotional levels, and emotion directly affects their subsequent altruistic behavior.

Most previous studies have focused on the effect of emotional valence on adults' third-party altruistic behavior. Negative emotion is related to third-party punishment behavior; for example, subjects with angry emotions propose higher third-party punishment amounts than those in neutral emotions (Gummerum et al., 2016), while positive emotion can positively predict people's third-party compensation behavior (Hao et al., 2016). Xie et al. (2022) found that experiences of being treated with advantageous unfairness can positively predict people's third-party compensation behavior through positive emotion, while experiences of being treated with disadvantageous unfairness positively predict people's third-party punishment behavior through negative emotion. Sanfey et al. (2003) also found from a brain mechanism perspective that people's fairness decisions consist of emotional and cognitive components, where the pursuit of fairness corresponds to activity in the anterior insula (a brain emotional region). Existing developmental studies have mainly focused on the effect of emotional valence on prosocial behavior in children's resource allocation. Chen et al. (2012) used "happy or not" measurements in an ultimatum game task to examine the effect of emotional valence on children's decision-making and found that children made friendly decisions when in positive emotions and hostile decisions when in negative emotions. Ma et al. (2011) found that primary and secondary school students allocated more resources to others when positive-valence emotions were induced and allocated fewer resources to others when negative-valence emotions were induced. Gummerum et al. (2020) also used "(un)happy/pleasure" measurements to examine the effect of emotional valence on 9-year-old children's second-party punishment behavior and found that children's unpleasure was highly positively correlated with their punishment intensity. In summary, emotional valence has an important effect on third-party altruistic behavior in unfair situations, but no study has directly examined the effect of emotion on children's third-party punishment and compensation behaviors. Referring to relevant children's emotion studies (Chen et al., 2012; Gummerum et al., 2020) and considering that children are more familiar with the emotion word "happy" (Zhang, 2011), this study used "(un)happy" to measure children's emotional valence.

Furthermore, Haruno and Frith (2010) further examined the effect of SVO on emotion and prosocial behavior and found that prosocial individuals showed stronger amygdala activation than pro-self individuals when facing unfair proposals, indicating that prosocial individuals showed stronger negative emotions and subsequently made prosocial behaviors. Individuals' SVO affects their expectations of others' behaviors, thereby affecting prosocial behavior (Qi et al., 2017). Whether others' behaviors meet individuals' expectations also affects their emotions, and emotion has an important effect on the decision-making process of third-party punishment and compensation (Fang & Chen, 2011; Xie et al., 2022). Therefore, this study hypothesizes that emotion plays a mediating role in the relationship between 10–12-year-old children's SVO and third-party altruistic behavior in unfair allocation situations.

1.4 Research Questions and Hypotheses

The purpose of this study was to examine the mechanisms of 10–12-year-old children's SVO and emotion on third-party altruistic behavior under three allocation conditions and to compare the differences between children's third-party punishment and compensation behaviors. We designed two experiments using third-party punishment and compensation paradigms, respectively, with 10–12-year-old children as participants, to explore the following questions under highly unfair, moderately unfair, and fair proposals: (1) How does children's SVO affect their emotion and third-party altruistic behavior? (2) In unfair situations, does emotion mediate the relationship between children's SVO and third-party altruistic behavior? (3) Under the same allocation situation, how do available third-party altruistic methods (punishment vs. compensation) affect children's emotions and behaviors? Children aged 10–12 are at a critical stage of basic socialization, having just formed altruistic behaviors and about to form stable SVO. A comprehensive examination of their personality tendencies, immediate emotions, and behavioral performance helps to understand how they make altruistic behaviors when their own interests are not affected. Additionally, this study is the first to examine two types of third-party altruistic behaviors in 10–12-year-old children, providing evidence for children's third-party compensation behavior to supplement existing research.

Based on previous research and relevant theories, this study hypothesizes that: Children's SVO affects their emotion and third-party altruistic behavior differently under fair and unfair situations; emotion mediates the relationship between children's SVO and third-party altruistic behavior in unfair allocation situations; children's emotions and behaviors differ under the same allocation situation due to different available third-party altruistic methods. Children aged 10–12 are at a critical stage of basic socialization, having just formed altruistic behaviors and about to form stable SVO. A comprehensive examination of their personality tendencies, immediate emotions, and behavioral performance helps to understand how they make altruistic behaviors when their own interests are not affected. Additionally, this study is the first to examine two types of third-party altruistic behaviors in 10–12-year-old children, providing evidence for children's third-party compensation behavior to supplement existing research.

2. Experiment 1: The Effect of Social Value Orientation on Third-Party Punishment Behavior in Children Aged 10–12

2.1 Purpose

Experiment 1 examined the effect of SVO on third-party altruistic behavior in children aged 10–12 using a third-party punishment task and proposed two hypotheses. Hypothesis 1 stated that SVO and allocation fairness interactively affect children's emotion and third-party punishment behavior. Hypothesis 2 stated that emotion mediates the relationship between SVO and third-party punishment behavior in unfair situations.

2.2 Method

2.2.1 Participants Based on calculations using G*Power 3.1, for the between-subjects repeated-measures ANOVA applicable to this experiment, the minimum required sample size was 158 (Effect Size = 0.25, $\alpha = 0.05$, Power = 0.8). Using random cluster sampling, two classes from each of grades four, five, and six were selected from an elementary school in Nanjing. This experiment recruited 243 children, and 10 invalid cases were excluded due to missing data. The final sample consisted of 233 children, including 118 boys (approximately 51%). There were 73 fourth graders (M $\pm$ SD = 10.52 $\pm$ 0.59 years), 85 fifth graders (11.36 $\pm$ 0.30 years), and 75 sixth graders (12.36 $\pm$ 0.26 years). There was no significant difference in gender distribution across grades, $^{2}(2, n = 233) = 0.672$, $p = 0.715$. The experimenter reminded children during the instructions and throughout the experiment: "The number of gold coins you obtain in the experiment determines the value of the gift you can exchange." The purpose was to make children believe their choices were linked to real rewards, thereby making more authentic choices. However, all participating children ultimately received a small gift worth 5 RMB (e.g., a notebook or pen) randomly distributed by the experimenter, and they were not informed that everyone received the same reward. All participants and their parents signed informed consent forms before the experiment. All experimental procedures were approved by the Ethics Committee of the Department of Psychology at Renmin University of China.

2.2.2 Design A 2 (SVO: prosocial, pro-self) $\times$ 3 (allocation fairness: high inequality, moderate inequality, fair) mixed design was used. SVO was a between-subjects variable, and allocation fairness was a within-subjects variable. The main dependent variables were participants' emotion and third-party punishment behavior.

2.2.3 Materials and Procedure After reporting basic information such as gender, age, and grade, participants completed the SVO slider questionnaire and then completed the third-party punishment task under high inequality, moderate inequality, and fair conditions. The specific materials were as follows.

Social Value Orientation Slider Questionnaire. The SVO slider questionnaire (Murphy et al., 2011) was used to measure children's SVO. The questionnaire consists of two parts: primary items and secondary items. This study only used the primary items, which include 6 questions, each with 9 monetary allocation options between self and others. Participants needed to choose their most preferred option. The questionnaire calculates the SVO angle, i.e., SVO°. According to the formula, those with angles greater than or equal to 22.45° are prosocial, and those with angles less than 22.45° are pro-self. The calculation formula is as follows:

SVO arctan

where OA is the average for others, and SA is the average for the participant.

This measurement tool has good test-retest reliability and convergent validity; it is faster and more accurate than other tools; it can report both categorical results and continuous SVO variables (Murphy et al., 2011). This method has superior psychometric properties and is more acceptable to 10–12-year-old children due to its relatively simple composition (Wu, 2018).

Third-Party Punishment Task and Emotion Measurement. The third-party punishment experimental paradigm adapted from the dictator game was used, where one party is the allocator, another is the recipient, and the participant is the third-party bystander. Emotion was measured during the experimental task. The procedure: Participants were told "Here are 10 gold coins"; the allocation proposal "Allocator gives X coins to recipient" was presented sequentially; participants reported their emotional valence on a 7-point scale (from 1 "very unhappy" to 7 "very happy," with 4 as "calm") based on Gummerum et al. (2020); participants were told "Now you have 5 gold coins, you can choose to keep them all or take some to punish the allocator." The punishment ratio was set at 1:2, meaning that for every 1 coin the participant spent to punish, the allocator would lose 2 coins (Gummerum & Chu, 2014). After understanding this mechanism, participants decided how many coins to spend to punish the allocator. The punishment amount could be any integer from 0 to 5. The three allocations were presented once each in order to all participants: high inequality, moderate inequality, and fair allocation. After each allocation was presented, participants reported their emotion and punishment amount.

The amount of coins participants were willing to spend to punish reflected their degree of punishment toward the allocator as a third party. Participants' punishment amount was used as the dependent variable in a 2 (SVO: prosocial, pro-self) × 3 (allocation fairness: high inequality, moderate inequality, fair) repeated-measures ANOVA.

2.3 Results

2.3.1 Descriptive Statistics Among the participants in this experiment, 156 were prosocial (51.3% girls) and 77 were pro-self (45.5% girls). There was no significant difference in gender distribution between prosocial and pro-self individuals, $^{2}(1, n = 233) = 0.700$, $p = 0.403$. Other descriptive statistics are shown in Table 1 .

Table 1. Descriptive Statistics

Variable	Experiment 1 (Third-Party Punishment Task, n = 233)	Experiment 2 (Third-Party Compensation Task, n = 238)
Gender (boys)	50.6%	50.4%
Age (years)	11.39 ± 0.81	11.40 ± 0.83

Variable	Experiment 1 (Third-Party Punishment Task, n = 233)	Experiment 2 (Third-Party Compensation Task, n = 238)
SVO (pro-self)	33%	26.5%
SVO angle	28.85 ± 13.16	31.00 ± 13.00
High inequality emotion	2.19 ± 1.21	2.36 ± 1.33
High inequality coins spent	2.68 ± 1.57	2.64 ± 1.42
Moderate inequality emotion	3.24 ± 1.03	3.24 ± 1.03
Moderate inequality coins spent	1.60 ± 1.14	1.79 ± 1.13
Fair emotion	5.23 ± 1.30	5.00 ± 1.25
Fair coins spent	0.24 ± 0.85	0.47 ± 1.14

Note: "Coins spent" refers to participants' third-party punishment amount (Experiment 1) or third-party compensation amount (Experiment 2).

2.3.2 Interactive Effects of SVO and Allocation Fairness on Emotion and Third-Party Punishment Participants' emotions when facing allocation proposals of different fairness levels were related to their willingness to

punish the allocator as a third party. Using participants' emotion as the dependent variable, a 2 (SVO: prosocial, pro-self) × 3 (allocation fairness: high inequality, moderate inequality, fair) repeated-measures ANOVA showed a significant main effect of allocation fairness, $F(1, 306) = 411.48$, $p < 0.001$, $p^2 = 0.64$, with children showing the most negative emotion in the high inequality condition and the most positive emotion in the fair condition. The main effect of SVO was not significant, $F(1, 231) = 1.64$, $p = 0.202$. The interaction between SVO and allocation fairness was significant, $F(1, 306) = 4.10$, $p = 0.033$, $p^2 = 0.02$. Simple effects analysis showed that in the high inequality condition, prosocial individuals' emotions were significantly more negative than pro-self individuals' (2.02 ± 1.09 vs. 2.43 ± 1.39, $p = 0.014$), with no significant differences in the moderate inequality or fair conditions ($p > 0.1$), as shown in Figure 1 Figure 1: see original paper.

For easier understanding, we transformed "emotion" into "unpleasure" in the mediation analysis, with the calculation formula: unpleasure = -(emotion - 4). Unpleasure ranges from -3 to 3, with higher values indicating greater unhappiness and 0 indicating calm.

Using participants' punishment amount as the dependent variable, a 2 (SVO: prosocial, pro-self) × 3 (allocation fairness: high inequality, moderate inequality, fair) repeated-measures ANOVA showed a significant main effect of allocation fairness, $F(2, 360) = 280.77$, $p < 0.001$, $p^2 = 0.55$, with children showing the highest punishment amount in the high inequality condition and the lowest in the fair condition. The main effect of SVO was significant, $F(1, 231) = 7.32$, $p = 0.007$, $p^2 = 0.03$. The interaction between allocation fairness and SVO was significant, $F(2, 360) = 11.31$, $p < 0.001$, $p^2 = 0.05$. Simple effects analysis showed that in the high inequality condition, prosocial individuals' punishment amounts were significantly higher than pro-self individuals' (2.96 ± 1.44 vs. 2.13 ± 1.77, $p = 0.014$). In the moderate inequality condition, prosocial individuals' punishment amounts were marginally significantly higher than pro-self individuals' (1.70 ± 1.04 vs. 1.40 ± 1.30, $p = 0.061$), as shown in Figure 1(B).

2.3.3 Mediating Effect of Emotion Using the SPSS Process plugin compiled by Hayes et al. (2017) and the Bootstrap test method (Edwards & Lambert, 2007), Model 4 was selected to test the mediating effect of emotion in the relationship between children's SVO and third-party punishment behavior, with gender and age as covariates. Based on the correlation analysis results of all variables in Experiment 1 (not shown in the main text due to space limitations, see Appendix Table S1 for details), only in the high inequality condition did SVO, unpleasure, and third-party punishment behavior meet the prerequisites for mediation analysis. Therefore, subsequent analysis only tested the mediating effect of emotion in this condition. All variables were standardized before analysis. The regression analysis results among variables are shown in Table 2 .

The results showed that the regression equation with SVO as the predictor and

third-party punishment behavior as the outcome variable was significant, $F(3, 229) = 8.29$, $p < 0.001$. The regression equation with SVO and unpleasure as predictors and third-party punishment behavior as the outcome variable was also significant, $F(4, 228) = 15.09$, $p < 0.001$. In the high inequality condition, SVO positively predicted unpleasure ($\beta = 0.17$, $t = 2.63$, $p = 0.009$), and unpleasure positively predicted third-party punishment behavior ($\beta = 0.34$, $t = 5.67$, $p < 0.001$). Covariates age and gender had no significant effect on third-party punishment behavior in the mediation model. The mediating effect test results are detailed in Appendix Table S2, and the mediating effect path is shown in Figure 2 [Figure 2: see original paper].

In the high inequality condition, the indirect effect of unpleasure was 0.06, with a 95% confidence interval [0.01, 0.11] not containing 0, indicating a significant indirect effect. The direct effect of SVO on third-party punishment behavior was 0.21, with a 95% confidence interval [0.09, 0.33] not containing 0, indicating a significant direct effect. The results show that emotion plays a partial mediating role, accounting for 21.6% of the total effect. That is, the more prosocial children's SVO, the more unpleased they are in high inequality situations, which in turn increases third-party punishment behavior.

3. Experiment 2: The Effect of Social Value Orientation on Third-Party Compensation Behavior in Children Aged 10–12

3.1 Purpose

Third-party altruistic behavior includes not only third-party punishment but also third-party compensation. To further understand children's third-party altruistic behavior, Experiment 2 recruited another group of 10–12-year-old children to participate in a third-party compensation task. To examine the effects of SVO and emotion on children's altruistic behavior in the third-party compensation task and compare differences in children's performance under the two third-party altruistic methods, we proposed three hypotheses. Hypothesis 3 stated that SVO and allocation fairness interactively affect children's emotion and third-party compensation behavior. Hypothesis 4 stated that emotion mediates the relationship between SVO and third-party compensation behavior in unfair situations. Hypothesis 5 stated that children's emotions and behaviors differ under the same allocation situation when different third-party altruistic methods are available.

3.2 Method

3.2.1 Participants Based on calculations using G*Power 3.1, for the between-subjects repeated-measures ANOVA applicable to this experiment, the minimum required sample size was 158 (Effect Size = 0.25, $\alpha = 0.05$, Power = 0.8). Using random cluster sampling, two classes from each of grades four, five, and

six were selected from an elementary school in Nanjing. This experiment recruited 241 children, and 3 invalid cases were excluded due to missing values. The final sample consisted of 238 children, including 120 boys (approximately 50%). There were 68 fourth graders (10.35 ± 0.34 years), 85 fifth graders (11.34 ± 0.29 years), and 75 sixth graders (12.41 ± 0.27 years). There was no significant difference in gender distribution across grades, $^2(2, n = 238) = 0.341$, $p = 0.843$.

3.2.2 Design A 2 (SVO: prosocial, pro-self) × 3 (allocation fairness: high inequality, moderate inequality, fair) mixed design was used. The main dependent variables were participants' emotion and third-party compensation behavior.

3.2.3 Procedure The procedure and materials of Experiment 2 were basically the same as those of Experiment 1, with the difference being that Experiment 1 was a third-party punishment task where participants spent coins to punish the allocator, while Experiment 2 was a third-party compensation task where participants spent coins to compensate the recipient. In subsequent analyses, Experiment 1's third-party punishment amount and Experiment 2's third-party compensation amount were collectively referred to as third-party altruistic amount. Although the targets of the two third-party altruistic amounts were the allocator and recipient respectively, with different specific functions, overall they both measured participants' behavior of using personal resources to maintain fairness.

3.3 Results

3.3.1 Descriptive Statistics Among the participants in this experiment, 175 were prosocial (49.1% girls) and 63 were pro-self (50.8% girls). There was no significant difference in gender distribution between prosocial and pro-self individuals, $^2(1, n = 238) = 0.050$, $p = 0.822$. Other descriptive statistics are shown in Table 1.

3.3.2 Interactive Effects of SVO and Allocation Fairness on Emotion and Third-Party Compensation Participants' emotions when facing allocation proposals of different fairness levels were related to their willingness to compensate the recipient as a third party. Using participants' emotion as the dependent variable, a 2 (SVO: prosocial, pro-self) × 3 (allocation fairness: high inequality, moderate inequality, fair) repeated-measures ANOVA showed a significant main effect of SVO, $F(1, 236) = 8.08$, $p = 0.005$, $p^2 = 0.03$. The main effect of allocation fairness was significant, $F(1, 339) = 203.79$, $p < 0.001$, $p^2 = 0.46$, with children showing the most negative emotion in the high inequality condition and the most positive emotion in the fair condition. The interaction between SVO and allocation fairness was significant, $F(1, 339) = 16.16$, $p < 0.001$, $p^2 = 0.06$. Simple effects analysis showed that in the high inequality condition, prosocial individuals' emotions were significantly more negative than

pro-self individuals' (2.10 ± 1.01 vs. 3.08 ± 1.80, $p < 0.001$). In the moderate inequality condition, prosocial individuals' emotions were significantly more negative than pro-self individuals' (3.15 ± 0.92 vs. 3.46 ± 1.28, $p = 0.043$). In the fair condition, prosocial individuals' emotions were significantly more positive than pro-self individuals' (5.09 ± 1.21 vs. 4.73 ± 1.33, $p = 0.049$), as shown in Figure 3 Figure 3: see original paper.

The number of coins participants were willing to spend reflected their degree of compensation toward the recipient as a third party. Using participants' compensation amount as the dependent variable, a 2 (SVO: prosocial, pro-self) × 3 (allocation fairness: high inequality, moderate inequality, fair) repeated-measures ANOVA showed a significant main effect of SVO, $F(1, 236) = 26.01$, $p < 0.001$, $p^2 = 0.10$. The main effect of allocation fairness was significant, $F(2, 394) = 280.10$, $p < 0.001$, $p^2 = 0.54$, with children showing the highest compensation amount in the high inequality condition and the lowest in the fair condition. The interaction between allocation fairness and SVO was significant, $F(2, 394) = 17.38$, $p < 0.001$, $p^2 = 0.07$. Simple effects analysis showed that in the high inequality condition, prosocial individuals' compensation amounts were significantly higher than pro-self individuals' (3.10 ± 1.25 vs. 1.86 ± 1.31, $p < 0.001$). In the moderate inequality condition, prosocial individuals' compensation amounts were also significantly higher than pro-self individuals' (1.97 ± 1.08 vs. 1.30 ± 1.12, $p < 0.001$). In the fair condition, the difference was not significant ($p > 0.1$), as shown in Figure 3(B).

3.3.3 Mediating Effect of Emotion The mediation analysis followed the same procedure as Experiment 1. Based on the correlation analysis results of all variables in Experiment 2 (see Appendix Table S3 for details), both unfair allocation conditions met the prerequisites for mediation analysis with SVO, unpleasure, and third-party compensation behavior. Therefore, subsequent analysis tested the mediating effect of emotion in both high and moderate inequality conditions. All variables were standardized before analysis. The regression analysis results among variables are shown in Table 2.

The results showed that in the high inequality condition, the regression equation with SVO as the predictor and third-party compensation behavior as the outcome variable was significant, $F(3, 234) = 26.64$, $p < 0.001$. The regression equation with SVO and unpleasure as predictors and third-party compensation behavior as the outcome variable was also significant, $F(4, 233) = 23.45$, $p < 0.001$. In the high inequality condition, SVO positively predicted unpleasure ($\beta = 0.44$, $t = 7.49$, $p < 0.001$), and unpleasure positively predicted third-party compensation behavior ($\beta = 0.20$, $t = 3.26$, $p = 0.001$). Covariates age and gender had no significant effect on third-party compensation behavior in the mediation model. Although the regression relationships among variables in the moderate inequality condition were all significant, emotion did not play a significant mediating role according to the mediation effect test results. The mediating effect test results are detailed in Appendix Table S4, and the mediating effect

path is shown in Figure 4 [Figure 4: see original paper].

In the high inequality condition, the indirect effect of unpleasure was 0.09, with a 95% confidence interval [0.02, 0.16] not containing 0, indicating a significant indirect effect. The direct effect of SVO on third-party compensation behavior was 0.41, with a 95% confidence interval [0.29, 0.53] not containing 0, indicating a significant direct effect. The results show that emotion plays a partial mediating role, accounting for 18% of the total effect. That is, the more prosocial children's SVO, the more unpleased they are in high inequality situations, which in turn increases third-party compensation behavior.

3.3.4 Effects of Third-Party Altruistic Methods on Children's Emotion and Behavior To examine the effect of third-party altruistic methods on children's emotion and behavior, we compared participants' emotions and coins spent in corresponding allocation conditions between Experiment 1 (third-party punishment group) and Experiment 2 (third-party compensation group). First, using SVO, gender, age, etc. as dependent variables, independent samples t-tests showed no significant differences between the third-party punishment and compensation groups on these variables.

Using participants' emotion as the dependent variable, a 2 (third-party altruistic method: punishment, compensation) $\times$ 3 (allocation fairness: high inequality, moderate inequality, fair) repeated-measures ANOVA showed no significant main effect of third-party altruistic method, $F(1, 469) = 0.06$, $p = 0.812$. The main effect of allocation fairness was significant, $F(1, 646) = 795.37$, $p < 0.001$, $p^2 = 0.63$, with children showing the most negative emotion in the high inequality condition and the most positive emotion in the fair condition. The interaction between third-party altruistic method and allocation fairness was significant, $F(1, 646) = 12.83$, $p < 0.001$, $p^2 = 0.03$. Simple effects analysis showed that in both unfair conditions, the third-party compensation group showed more positive emotion than the third-party punishment group, with a marginally significant difference in the high inequality condition (2.36 ± 1.33 vs. 2.15 ± 1.20, $p = 0.078$) and a statistically significant difference in the moderate inequality condition (3.24 ± 1.03 vs. 3.03 ± 0.95, $p = 0.023$). However, in the fair condition, the third-party compensation group showed more negative emotion than the third-party punishment group, with a statistically significant difference (5.00 ± 1.25 vs. 5.46 ± 1.35, $p < 0.001$). This indicates that when the available third-party altruistic method is compensation, children consider fair allocation more reasonable, thus showing less emotional fluctuation than the third-party punishment group, as shown in Figure 5 Figure 5: see original paper.

Using participants' coins spent as the dependent variable, a 2 (third-party altruistic method: punishment, compensation) $\times$ 3 (allocation fairness: high inequality, moderate inequality, fair) repeated-measures ANOVA showed a marginally significant main effect of third-party altruistic method, $F(1, 469) = 3.83$, $p = 0.051$, $p^2 = 0.01$, with the third-party compensation group showing higher al-

truistic amounts than the punishment group (1.68 ± 0.06 vs. 1.51 ± 0.06). The main effect of allocation fairness was significant, $F(2, 740) = 754.91$, $p < 0.001$, $p^2 = 0.62$, with children showing the highest third-party altruistic amount in the high inequality condition and the lowest in the fair condition. The interaction between third-party altruistic method and allocation fairness was not significant, $F(2, 740) = 0.82$, $p = 0.417$. The results showed that compared with the third-party punishment group, the compensation group spent more coins under all three allocation conditions. Specifically, in the moderate inequality condition, the compensation group spent marginally significantly more coins than the punishment group (1.79 ± 1.13 vs. 1.60 ± 1.14, $p = 0.065$). In the fair condition, the compensation group spent significantly more coins than the punishment group (0.47 ± 1.14 vs. 0.24 ± 0.85, $p = 0.011$), as shown in Figure 5(B).

4 General Discussion

4.1 Social Value Orientation (Prosocial vs. Pro-Self) Affects Children's Third-Party Altruistic Behaviors

Experiment 1 found that in the third-party punishment task, prosocial children (vs. pro-self) were more unpleased in the high inequality condition and spent more coins to punish the allocator, with no significant differences in emotion or third-party punishment behavior in the moderate inequality or fair conditions. Experiment 2 found that in the third-party compensation task, prosocial and pro-self children differed in emotion across all three allocation conditions. In both high and moderate inequality conditions, prosocial children were more unpleased than pro-self children and spent more on third-party compensation. In the fair condition, prosocial children were more pleased than pro-self children, with no significant difference in third-party compensation amounts.

Overall, the results of Experiments 1 and 2 confirm that SVO affects children's third-party altruistic behavior, and that the effect of SVO on children's third-party altruistic behavior differs under fair and unfair situations. Compared with pro-self children, prosocial children make more third-party punishment and compensation behaviors in unfair situations. These results support Schwartz's (1977) social norm activation theory, indicating that both types of third-party altruistic behavior in 10–12-year-old children depend on individuals' SVO and situational allocation fairness. This also confirms that by late childhood, children have generally formed fairness principles for both self and others, and prosocial children's fairness principles are more stable.

4.2 Emotion Plays a Mediating Role in High Inequality Situations

SVO affects children's emotions in high inequality situations. In both Experiments 1 and 2, the more prosocial children's SVO, the more unpleased they were when seeing highly unfair proposals. This confirms that prosocial children, compared with pro-self children, care more about "fairness" than personal inter-

ests. Even though highly unfair proposals do not affect prosocial children's own interests, they still feel unpleased. Experiments 1 and 2 consistently showed that the more prosocial children's SVO, the more unpleased they are when seeing highly unfair proposals, which in turn leads to more third-party altruistic behaviors. This finding confirms in children that emotion not only plays an important role in fairness decisions related to self-interest (Pillutla & Murnighan, 1996; Sanfey et al., 2003) but also in third-party altruistic decisions unrelated to self-interest. Unpleasure (i.e., emotion) can predict not only children's third-party punishment behavior but also their third-party compensation behavior. Fehr and Schmidt (1999) first proposed "inequality aversion," suggesting that people experience aversive emotions when facing unfair situations. Liang et al. (2015) also pointed out based on a social utility model that people are more satisfied with allocations where they and others receive the same amount (fair allocation) than with allocations where they receive more than others (advantageous unfair allocation). Our findings, together with previous research, reveal that unfair proposals affect children's emotions, so children maintain fairness through third-party altruism and other means to balance negative emotions. This result further supports social norm activation theory and again confirms the "cognition-emotion" dual-system model in the decision-making domain from a behavioral perspective. According to Reno et al. (1993), third-party punishment and compensation tasks allow children to see others destroying or maintaining social norms, jointly activating children's social norms at both cognitive and emotional levels. Previous research has emphasized that third-party punishment tasks evoke specific emotions (e.g., anger) in individuals, who then make altruistic behaviors (Chen et al., 2015). This study confirms that the mechanism of emotion's effect on third-party altruistic behavior is not limited to a specific emotion type; different emotional valences also have obvious effects on third-party altruistic behavior.

Additionally, we believe that the reason why the mediating effect of emotion only appears in high inequality situations and not in moderate inequality situations may be because children, as disinterested third parties, still consider moderately unfair allocation proposals acceptable, and only extremely unfair situations elicit obvious emotional fluctuations.

4.3 Children's Emotions and Behaviors Differ Based on Available Third-Party Altruistic Methods (Punishment vs. Compensation)

Comparing participants' emotions and coins spent in the third-party punishment and compensation groups under the same allocation situation, the results showed that when the available third-party altruistic method was compensation (vs. punishment), children showed less emotional fluctuation when facing different allocation proposals but spent more coins to maintain fairness in the moderate inequality condition. This finding confirms Hypothesis 5.

We believe that children's emotional differences under different third-party altruistic methods may be due to differences in the intrinsic motivations cor-

responding to the two methods (deterrence vs. justice-based care) in evoking positive and negative emotions. From a psychological mechanism perspective, although both third-party punishment and compensation are costly third-party altruistic behaviors, the two behaviors are not completely equal. The intrinsic motivation for third-party punishment behavior is deterrence and retribution (Carlsmith, 2006; Carlsmith et al., 2002), which can reduce current feelings of unfairness and also reduce the occurrence of future unfairness (Wenzel & Thielmann, 2006). The intrinsic motivation for third-party compensation behavior is justice-based care, which can reduce feelings of unfairness but cannot reduce the occurrence of unfairness (Carlsmith, 2006; Carlsmith et al., 2002). Additionally, we believe that emotional differences may be caused by different roles and powers corresponding to the two altruistic methods. When we stipulate that child participants use a certain third-party altruistic method to maintain fairness, we assign them corresponding roles and powers. Children in the third-party punishment group are given the power to punish violators, while children in the third-party compensation group are given the power to compensate victims. Previous research has proposed that third-party punishment not only punishes violators but also maintains social order, whereas third-party compensation does not have a direct effect on maintaining social order (Chavez & Bicchieri, 2013). Therefore, children given third-party punishment have greater power and thus may have a stronger sense of responsibility, showing stronger inequality aversion and greater emotional fluctuation when seeing unfair proposals.

The behavioral differences between the third-party punishment and compensation groups may be because the moderate inequality situation does not endanger children's own interests and is not severe enough to evoke children's motivation to deter others, so children in the compensation group make more altruistic behaviors. Additionally, indirect reciprocity theory and Kohlberg's theory of moral cognitive development can also explain this difference. According to indirect reciprocity theory, people make third-party altruistic behaviors to maintain fairness norms, thereby establishing a good reputation in the group and receiving fair treatment in future interactions with others (Nowak, 2006). From the perspective of indirect benefits, third-party compensation can obtain a better reputation (Jordan et al., 2016). According to Kohlberg's theory of moral cognitive development (Kohlberg & Kramer, 1969), 10–12-year-old children are at the conventional level, which includes two stages: the seeking approval stage and the authority obedience stage. Children in this age range are in the seeking approval stage and will make prosocial behaviors for reputation and interpersonal relationships (Eisenberg et al., 2006). Therefore, 10–12-year-old children making more third-party compensation behaviors is not only to maintain fairness but also to obtain recognition and praise.

4.4 Innovations and Limitations

This study is the first to examine the mechanisms of SVO on two types of third-party altruistic behaviors in 10–12-year-old children and found that emo-

tion plays a mediating role in high inequality situations. This result supports social norm activation theory and expands its applicable scope, showing that the theory can explain both third-party punishment behavior and well describe the formation mechanism of third-party compensation behavior. Children aged 10–12 are in the initial stage of altruistic behavior formation (Liang et al., 2015; McAuliffe et al., 2017), and their SVO is still not stable (Li et al., 2013). However, even when fairness norms are highly violated, unstable SVO still has an obvious effect on third-party altruistic behavior. This result indicates that even though children at this stage hope to gain recognition and praise, prosocial-oriented children (vs. pro-self) still make more third-party punishment behaviors in moderate inequality situations, again emphasizing the importance of prosocial orientation. This suggests that teachers and parents of 10–12-year-old children can guide children to form stable prosocial orientations by praising children's prosocial behaviors and constructing prosocial learning and living atmospheres. If everyone in society has a stable prosocial orientation, then whenever social norm violations occur, violators will be punished and victims will be compensated, and society will be orderly.

This study not only examined children's third-party punishment behavior, as in previous research, but also examined children's third-party compensation behavior, providing evidence from a developmental perspective for differences between the two behaviors. We examined the two behaviors separately but found that even when excluding the influence of choice situations (Jordan et al., 2016), children still made more third-party compensation behaviors. That is, children in the third-party compensation group were stronger than the punishment group in maintaining norms in moderate inequality situations. This again confirms that humans' preference for third-party compensation is stable (van Doorn et al., 2018). At a practical level, this result also suggests that teachers and parents of 10–12-year-old children should praise children's third-party punishment behavior more, helping children recognize that although "punishment" may seem unfriendly, punishing fairness norm violations can maintain social order and is a commendable behavior. Although children's preferred third-party compensation is also a way to maintain fairness, third-party punishment has a better effect on maintaining fairness than third-party compensation (Chavez & Bicchieri, 2013). Therefore, even though children prefer third-party compensation, it is necessary to cultivate children to make more third-party punishment behaviors and encourage them to dare to punish violators.

Although this study obtained some meaningful findings, it also has some limitations. First, for participants, the available third-party altruistic method was singular—they could only decide whether to spend coins and how many to spend, not choose which method to use to maintain fairness. Although this avoided the influence of choice situations, it still could not directly answer "which third-party altruistic method children prefer to use to maintain fairness." Second, this study only set up singular third-party punishment and compensation tasks, not a combined third-party punishment and compensation task where participants could both punish the allocator and compensate the recipi-

ent. Future research could further explore more complex third-party altruistic behaviors. Additionally, this study used situational experimental questionnaires to investigate children in late childhood, using coin allocation as the situation, but this situation is difficult to completely replicate the social dilemmas children encounter in real life. Therefore, future research could use more life-like situations to improve the ecological validity of research conclusions.

5 Conclusions

(1) Most 10–12-year-old children have a prosocial SVO, and SVO affects children's third-party altruistic behavior.

(2) When the available third-party altruistic method is punishment, prosocial children (vs. pro-self) spend more coins to maintain fairness in high inequality situations, with emotion playing a mediating role.

(3) When the available third-party altruistic method is compensation, prosocial children (vs. pro-self) spend more coins to maintain fairness in both high and moderate inequality situations, with emotion playing a mediating role only in high inequality situations.

(4) Children's emotions and behaviors differ under the same allocation situation depending on the available third-party altruistic method. That is, when the available third-party altruistic method is compensation (vs. punishment), children show less emotional fluctuation when facing different allocation proposals but spend more coins to maintain fairness in moderate inequality situations.

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Appendices

Appendix Table S1. Correlation Analysis Results for Experiment 1

Variable	1	2	3	4	5	6	7
1. SVO angle	1						
2. High inequality emotion	-0.136*	1					
3. High inequality coins spent	0.241***	-0.393***	1				
4. Moderate inequality emotion	-0.081	0.636***	-0.307***	1			
5. Moderate inequality coins spent	0.165*	-0.251***	0.288***	-0.174**	1		
6. Fair emotion	0.178**	0.212**	-0.113	0.179**	-0.121	1	
7. Fair coins spent	0.181**	-0.099	0.263***	-0.062	0.668***	-0.233***	1
8. Age	-0.113	-0.004	0.179**	-0.113	0.181**	-0.215**	0.
9. Gender	-0.068	0.165*	-0.174**	0.178**	-0.121	0.212**	-0

Appendix Table S2. Indirect Effect Test Results of Emotion in High Inequality Condition for Experiment 1

Effect	Estimate	SE	95% CI
Indirect effect	0.06	0.02	[0.01, 0.11]
Direct effect	0.21	0.06	[0.09, 0.33]

Appendix Table S3. Correlation Analysis Results for Experiment 2

Variable	1	2	3	4	5	6
1. SVO angle	1					
2. High inequality emotion	-0.417***	1				
3. High inequality coins spent	0.494***	-0.385***	1			
4. Moderate inequality emotion	-0.172**	0.563***	-0.300***	1		
5. Moderate inequality coins spent	0.392***	-0.273**	0.699***	-0.296***	1	
6. Fair emotion	0.206**	-0.317***	0.167**	-0.075	0.206**	1
7. Fair coins spent	0.167**	-0.036	0.317***	-0.061	0.486***	-0.245***
8. Age	-0.144*	0.167**	-0.002	0.145*	-0.055	-0.028
9. Gender	-0.111	0.179**	-0.111	0.179**	-0.111	0.212**

Appendix Table S4. Indirect Effect Test Results of Emotion in Unfair Conditions for Experiment 2

Condition	Effect	Estimate	SE	95% CI
High inequality	Indirect effect	0.09	0.03	[0.02, 0.16]
High inequality	Direct effect	0.41	0.06	[0.29, 0.53]
Moderate inequality	Indirect effect	-0.003	0.02	[-0.05, 0.04]
Moderate inequality	Direct effect	0.18	0.05	[0.08, 0.28]

Note: Figure translations are in progress. See original paper for figures.