

Social Media and Adolescents' Prosocial Behavior: Evidence of the Interaction Between Short Videos and Social Value Orientation

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Background/Objective: Social media significantly influences adolescents' prosocial behavior. With smartphones becoming ubiquitous, short videos have emerged as the predominant social media format for adolescents. However, the effects of adolescents' engagement with short videos on their prosocial behavior remain uncertain. This study aims to address the problem of how short videos (content and consequences) affect prosocial behavior in adolescents, and simultaneously explores the differences of this effect among individuals with different social value orientations.

Methods: The current study conducted two research laboratory experiments using the between-subject study design of two factors. Study 1 (N=148) reveals that viewing prosocial short videos significantly predicts adolescents' prosocial behavior more so than neutral short videos. The interaction between short video content and social value orientation on prosocial behavior illustrates that the encouraging impact of prosocial content is primarily evident in prosocial individuals, rather than in pro-self individuals. In Study 2 (N=152), we introduce new dimensions by assessing adolescents' response to varying consequences of the same prosocial behavior (ie, reward, punishment) within the short video context. Findings indicate that reward consequences significantly bolster adolescents' prosocial behavior, whereas punitive measures tend to adversely affect it. Furthermore, the interaction between the consequences of prosocial short videos and social value orientation suggests that prosocial individuals exhibit no significant behavioral difference between rewards and punishments; instead, the reward/punishment consequences notably influence the prosocial behavior of pro-self individuals.

Conclusion: Short videos (content and consequences) and social value orientations interactively influence adolescents' prosocial behaviors. This study underscores the need to recognize individual differences in adolescents' use of short videos and its impact on their prosocial behavior, particularly highlighting the crucial role of their social value orientations. Practically, the research offers valuable insights for parents and professionals seeking to foster adolescents' prosocial behavior.

Keywords: social media, prosocial behavior, short videos, social value orientation, adolescents

Introduction

Social media have been defined as websites, services, and related tools that allow people to create and share their content.¹ The growth of social media use has been a prominent trend over the past decade, with platforms such as Facebook, Twitter, Instagram, and TikTok attracting billions of active users globally. As of 2023, there are nearly 5 billion active social media users around the globe and the average user spends 2 hours and 27 minutes on social media per day.² A recent study on social media use and mental health among adolescents concluded that most previous studies have focused on negative aspects of social media use.³ Less research seems to have been devoted to positive aspects of social media,⁴ such as prosocial behavior. Prosocial behavior has conventionally been defined as voluntary actions intended to benefit others.⁵ Such behaviors can be helping, comforting, sharing with, and supporting others. Previous studies have shown that prosocial behavior is significantly positively correlated with adolescents' academic performance,⁶ well-being,^{7,8} and friendship quality.⁹ Furthermore, considering adolescence as a stage of forming

individual values and worldviews, it is generally regarded as a critical period for the development of prosocial behavior.^{10,11} Therefore, scholars have been exploring the predictive factors of prosocial behavior to better cultivate and promote prosocial behavior among adolescents.^{12,13}

On the one hand, in the domain of social media, a substantial amount of research has explored the relationship between prosocial media content and prosocial behavior.^{14–16} For example, the behavior of protagonists in Disney animated movies helping their friends can increase children's prosocial behavior towards friends in real life.¹⁷ Similarly, Individuals show more prosocial behavior after watching superhero movies, suggesting that the superhero films positively impacted prosocial behavior.¹⁴ A laboratory experiment on music consumption also revealed similar results, that people significantly increase their prosocial behavior after listening to music with prosocial lyrics.¹⁸ Overall, the positive influence of prosocial media content on prosocial behavior has been confirmed.¹⁹

However, in reviewing the literature on prosocial social media content and prosocial behaviors, we found that the majority of existing research has been conducted in the traditional media domains of film,¹⁷ television,²⁰ and music.²¹ Although relevant research has extended to video games,²² there has been little attention to new media, especially short videos. Short videos, such as TikTok, as an emerging form of social media, with its rich content, convenient operation, immersive usage atmosphere, and diverse functions, fully meet the needs of adolescents for filling fragmented time, entertainment, socializing, and information retrieval.²³ Compared to TV programs and movies, short videos are easier to share on today's social media due to their short length. In fact, short videos have experienced rapid growth and attracted hundreds of millions of users worldwide.²⁴ Due to their brevity, short videos often need to present content in a more vivid or even dramatic way compared to traditional media in order to capture people's attention.²⁵ Therefore, consuming short videos may trigger strong cognitive and emotional responses in users, which has been shown to be an important foundational process for prosocial decision-making²⁶ as well as the crucial stage of prosocial development in adolescents, who are easily influenced by external factors and thus deserving of more attention in academic research. It is necessary to venture beyond the realms of traditional media and video games and explore the effects of consuming prosocial media content in the increasingly popular domain of short videos. Adolescents were chosen as the sample because they are in a key developmental period of worldview exploration^{27,28} and are also in an important stage of prosocial development, making them particularly worthy of academic attention.

Meanwhile, previous research has explored the impact of prosocial media content on prosocial behavior by comparing individual exposure to different types of content (such as prosocial content and neutral content). In fact, prosocial media content spread is much more complex and cannot be simply classified. For example, individuals may be exposed to media content depicting prosocial behavior, which can lead to different consequences: positive or negative. Positive consequences may include verbal praise, honorific titles, or material rewards, while negative consequences may involve being misunderstood, falling victim to porcelain bumping ("Porcelain bumping" is called "Pengci" in Chinese, which refers to a practice in contemporary China whereby scammers feign injury or financial loss in public to extort money from strangers),^{29,30} or even facing the risk of arrest.³¹ In today's media environment, individuals are likely to repeatedly encounter media figures experiencing different consequences due to their behaviors, which in turn may lead to cognitive and behavioral changes.³² For instance, Mayrhofer and Naderer (2019) found that the portrayal of positive consequences of alcohol consumption in movies or TV series increased the positive expectations and attitudes towards alcohol among light alcohol consumers.³³ In the domain of media and moral behavior, some studies have investigated how exposure to different behavioral consequences of media figures influences individuals' moral conduct. For instance, Yao and Enright (2020) randomly assigned 3–5 year old children to listen to a moral story with a rewarding consequence or a control story without a rewarding consequence, and the results showed that children in the reward group shared more candies with others compared to the control group.³⁴ These studies suggest that observing rewarded consequences of prosocial behavior effectively promotes the imitation of prosocial behavior. Based on these research findings, it can also be inferred that encountering punishing consequences of prosocial behavior significantly inhibits individuals from imitating the same prosocial behavior. Given the prevalence of such content in short video media, it is necessary to conduct more detailed studies by examining individuals' exposure to different consequences of the same prosocial behavior.

On the other hand, previous research has shown that adolescents' prosocial behavior is influenced not only by external factors but also by individual factors (personality traits).^{35,36} Personality traits influence prosocial behavior.³⁷ Social value orientation is a stable personality trait variable that reflects individual prosocial tendencies, representing

individuals' preference for the allocation of benefits to themselves and others in social situations, and reflecting individual differences in the extent to which decision-makers concern themselves with the interests of others in social decision-making situations.^{38,39} Researchers typically categorize social value orientations into three types: prosocial orientation, individualistic orientation, and competitive orientation.^{40,41} Prosocial individuals strive to maximize both their own and others' joint benefits while minimizing the disparity between the two. Individualistic individuals focus on maximizing their own benefits without concern for others. Competitive individuals aim to maximize the difference in benefits, seeking to obtain more than others. Scholars generally group individualistic orientation and competitive orientation under a single category referred to as pro-self orientation.⁴² In this study, individuals with a prosocial orientation are referred to as "prosocial individuals", while individuals with a pro-self orientation are referred to as "pro-self individuals". Joireman et al stated that individuals living in an environment characterized by trust and affection are likely to internalize honesty and mutual assistance as their default responses, potentially shaping them into prosocial individuals.⁴³ On the other hand, those immersed in deceit and betrayal may be molded into more self-centered individuals. According to the social value orientation theory,⁴⁴ prosocial individuals are inclined to consider both their own and others' consequences, while pro-self individuals focus more on their own gains. Consequently, compared to pro-self individuals, prosocial individuals are likely to exhibit more prosocial behaviors.^{45,46} It remains unclear whether there are differences in the prosocial behaviors of adolescents with different social value orientations when exposed to the same prosocial media content. Previous research has largely overlooked this issue. Therefore, this study proposes

Hypothesis 1: Individuals will encourage prosocial behavior by watching the prosocial short videos, and the effect of this promotion varies among individuals with different social value orientations.

According to Social Cognitive Theory (SCT), individuals can learn behavior by observing others' actions and the consequences that follow.⁴⁷ This observational learning process can occur between individuals as well as through media representations. Due to individuals' limited time, resources, and physiological constraints, they cannot acquire all knowledge and behaviors directly from their own experiences. Instead, most people's attitudes, values, and behavioral patterns are shaped by what they observe in the media environment.⁴⁷ However, it is important to emphasize that while individuals may emulate certain behaviors from media role models, they do not necessarily enact all learned behaviors in real life. Observational learning behavior is largely dependent on vicarious reinforcement,⁴⁷ which primarily stems from the consequences of role model behavior. Specifically, when the observed individual is rewarded for their behavior, the observer may be motivated to engage in similar behavior. Conversely, when the role model's behavior is punished, the observer is less likely to emulate it.^{47,48} For example, Lee et al found that hearing the story of "George Washington" increased children's truth-telling behavior, as the story emphasized the positive consequences of honesty.⁴⁹ This suggests that observing prosocial behavior with positive consequences can effectively promote prosocial behavior in observers. Based on these research findings, it is believed that exposure to punitive consequences of prosocial behavior significantly inhibits individuals from imitating the same prosocial behavior. Combining social cognitive theory with social value orientation theory, it is proposed that there are individual differences in the consequences of observational learning among adolescents with different social value orientations. For prosocial individuals, exposure to prosocial social media content triggers their observational learning and motivates them to exhibit more prosocial behavior; in contrast, for pro-self individuals, prosocial social media content does not effectively enhance their prosocial behavior, but media content depicting negative consequences of social behavior significantly diminishes their prosocial behavior. This may stem from differences in behavioral motivations between prosocial and pro-self individuals. For prosocial individuals, maximizing the common good is the optimal consequence, and exhibiting prosocial behavior is driven by intrinsic motivation, where exposure to prosocial content triggers this prosocial motivation. Conversely, for pro-self individuals, maximizing self-interest is the optimal solution, and exhibiting selfish behavior is driven by intrinsic motivation. Upon discovering the negative consequences associated with social behavior in media content, pro-self individuals are more inclined to prioritize protecting their own interests, thus reducing prosocial behavior. Therefore, this study proposes

Hypothesis 2: The different results of short videos (reward vs punishment) will differ between the prosocial behaviors of individuals with different social value orientations.

This study aims to investigate the effects of new social media platforms, specifically short videos, on the prosocial behaviors of adolescents in relation to social value orientations. It seeks to address two main questions: First, how does the content of short videos influence the prosocial behaviors of individuals with varying social value orientations? Second, what are the consequences of prosocial short video content on the prosocial behaviors of individuals with different social value orientations? To tackle the first question, Study 1 will manipulate different types of short videos (prosocial vs neutral) to explore the behavioral differences in prosocial individuals compared to those with pro-self individuals after viewing these videos. Building upon Study 1, Study 2 will further examine how the consequences of prosocial short videos (reward vs punishment) affect the prosocial behaviors of both prosocial and pro-self individuals. Thus, this research provides a deeper understanding of how exposure to prosocial media content and adolescent social values influences their social behavior.

Study 1

Methods

Research Design

A 2 (short video content: prosocial vs neutral) \times 2 (social value orientation: prosocial vs pro-self) between-subjects factorial design was utilized for this investigation, given its capacity to infer causality.⁵⁰ The dependent variable is the participant's donation behavior, as detailed in 2.4.2. All data in the current study were analyzed using SPSS 24.0 software.

Participants

Study 1 primarily investigated the influence of short video content and social value orientation on prosocial behavior. Prior to recruiting participants, we utilized G*Power⁵¹ to determine the minimum sample size necessary for the study. With reference to existing studies,⁵² calculations show that a total of 144 participants would be required to achieve a medium effect size of 0.20 with an expected power of 0.8. Through convenient sampling methods, we recruited 160 secondary school students from two secondary schools in Shanghai, China (secondary schools affiliated to the corresponding author's institution) as participants in this study. These participants completed the laboratory experiments at Tongji University from March to May 2023. Following the exclusion of incomplete data (with the criterion being incomplete participation in the experiment), we retained a valid sample of 148 participants (Response rate: 92.5%). The mean age of participants was 16.29 years ($SD = 1.46$), with 45.9% identifying as female. Study 1 received ethical approval from the Ethics Committee of Tongji University. All participants provided informed consent prior to their involvement in the study, which was conducted anonymously to ensure the protection of participants' privacy and confidentiality.

Stimulus

In this study, in order to find suitable experimental stimuli, we first used keywords such as "help" and "kindness" to search for relevant pro-social short videos on platforms such as TikTok, Weibo, and Bilibili. These short videos include but are not limited to strangers helping the elderly and drivers returning lost wallets to their owners. As for the control group short videos, we used keywords such as "travel" and "scenery" to search for relevant videos. After strict selection, we selected 6 short videos from the search results (3 pro-social short videos and 3 neutral short videos). There are two criteria for selection: pro-social short videos must explicitly mention typical pro-social behaviors (neutral short videos do not involve interpersonal interaction), and the videos must be clear and distinguishable.

Pilot Testing of Videos

To ensure the efficacy of these brief videos, a pilot test was conducted. We recruited 36 participants (different from formal participants) and assigned them to either prosocial or neutral content conditions by having them randomly draw grouping cards. Then, we asked the participants to indicate the extent to which they agreed with "the short videos reflected pro-social content". Participants were asked to rate using a five-point scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Additionally, they were also asked to evaluate the objectivity, credibility, relevance, and entertainment value of the short videos. As expected, participants in the pro-social content group ($M = 4.3$, $SD = 0.82$) perceived significantly higher scores for pro-social short videos compared to participants in the non-pro-social content

group ($M = 1.35$, $SD = 0.57$) [$t = -4.48$, $p < 0.001$, effect size = 0.89]. There were no significant differences in the evaluations of objectivity, credibility, relevance, and entertainment value of the videos between the two groups. Thus, the use of this stimulus in our experiment was appropriate.

Measures

Pre-Experimental measures

Demographics: Participants were required to report their gender and age. Past research suggested that these demographic variables were significant predictors of prosocial behavior.^{53–55} Thus, these factors were included as covariates in our study.

Social Value Orientation: The social value orientation is measured using the Social Value Orientation Slider Measure to assess individual pro-social traits.⁵⁶ This measure provides a continuous, non-categorical method for measuring social value orientation, consisting of 6 items. Participants are required to select their most preferred option from nine pairs of continuous money allocation options (for oneself and for a stranger) for each question. The ratio of the participant's average score to the average score of others is converted to the participant's social value orientation angle using the arctangent function. A larger angle indicates greater concern for others' payoffs (increased pro-sociality, with pro-social individuals' angles falling between 22.45° and 61.39°); a smaller angle indicates less concern for others' payoffs (increased selfishness, with pro-self individuals' angles falling between -12.04° and 22.45°).

Post-Experimental Measures

Manipulation Check Question: Participants were asked to rate their level of agreement with the following descriptions using a five-level Likert scale (1 point "strongly disagree", 5 points "strongly agree"): The short video reflects prosocial behavior.

Prosocial behavior: In this study, prosocial behavior is defined as participants' donation behavior. Participants were asked to donate to a real online charity project. The project described the living difficulties of children in impoverished areas and claimed to raise funds to improve the quality of life for these impoverished children (<http://www.rainbowforlove.org/>). At the end of the request, participants received the following instructions: "If you decide to donate your portion of the payment to this project, we will directly transfer the money to the charity organization".⁵⁷ Then, participants were asked how much money they would like to donate (ranging from 0–15 RMB). The amount they chose to donate was considered their prosocial behavior.

Procedures

All participants were informed that the purpose of the study was to investigate how watching short videos affects their cognitive abilities. In order to minimize potential harm caused by environmental and other factors, we invited participants to the same laboratory to take part in the study, and each participant's research procedures were consistent.

First, all participants completed the informed consent form and the demographic information and social value orientation scale (78 prosocial individuals, 70 pro-self individuals). Then, 78 prosocial individuals and 70 pro-self individuals were assigned to the prosocial content condition and the neutral content condition by randomly drawing group cards. Finally, there were 39 prosocial prosocial individuals, 39 prosocial neutral individuals, 35 pro-self prosocial individuals, and 35 pro-self neutral individuals, to ensure that participants attentively watched the video clips, they were instructed to take a memory test related to the video content after watching.

After watching the short videos, participants were asked to answer manipulation check questions. They were also asked to write down the amount they would donate from a bonus fund after reading a genuine charity appeal. Next, we examined whether participants had any suspicions about the relationship between watching the short videos and the donation task, and found that no one doubted the purpose of our experiment. Finally, we debriefed the participants about the true purpose of the study and paid them a 15 RMB participation fee. See Figure 1 for details.

Results

Manipulation Check and Descriptive Statistics

In our research, we found that participants in the pro-social content condition demonstrated significantly more pro-social behaviors in the short videos [$M = 4.62$, $SD = 0.69$] compared to the control group [$M = 0.95$, $SD = 1.39$, $t = 11.63$,

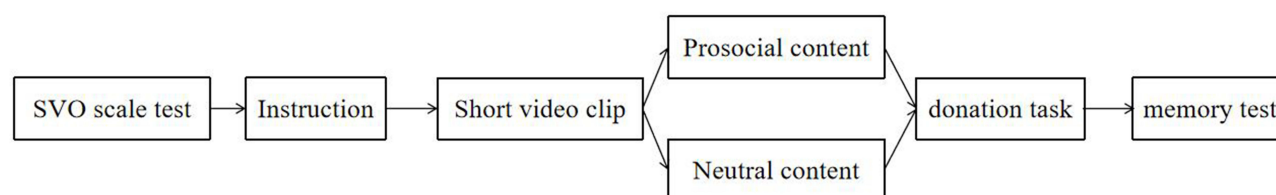


Figure 1 Study 1 Process.

Abbreviation: SVO, Social Value Orientation.

$p < 0.001$, effect size = 0.86]. These results indicate that we successfully manipulated the content type in the video shorts. Furthermore, we also found that participants' gender and age were independent across different experimental conditions. These results suggest that these factors are essentially evenly distributed across different experimental conditions. The descriptive statistics for each condition are presented in Table 1.

Two-Factor Analysis

Shapiro–Wilk test showed that p in all groups was greater than 0.05, which followed normal distribution, and ANOVA could be used. The analysis of variance on the two factors affecting participants' prosocial behavior (short video content: prosocial, neutral; social value orientation: prosocial, pro-self) revealed significant main effects of short video content, $F(1, 147) = 152.64$, $p < 0.001$, $\eta^2 = 0.52$, with participants donating significantly more after watching prosocial content videos ($M = 9.63$, $SD = 2.48$) compared to the control group ($M = 5.60$, $SD = 2.24$, effect size = 0.64); significant main effects of social value orientation, $F(1, 147) = 148.13$, $p < 0.001$, $\eta^2 = 0.63$, with prosocial individuals donating significantly more ($M = 10.17$, $SD = 1.53$) compared to pro-self individuals ($M = 5.07$, $SD = 0.73$, effect size = 0.88). There was also a significant interaction effect between short video content and social value orientation, with pro-self individuals showing no significant difference in prosocial behavior after watching both types of videos, while prosocial individuals exhibited significantly higher prosocial behavior after watching prosocial content videos ($M = 12.54$, $SD = 3.02$) compared to watching neutral content videos ($M = 6.88$, $SD = 3.25$, effect size = 0.67), as detailed in Figure 2. Furthermore, although pro-self individuals showed no significant difference in prosocial behavior after watching both types of videos, their prosocial behavior level increased slightly after watching prosocial content videos ($M = 5.45$, $SD = 2.34$) compared to neutral content videos ($M = 4.74$, $SD = 1.82$, effect size = 0.17).

While Study 1 categorizes short video content into prosocial and neutral content, the prosocial content mediated by the media is much more complex and cannot be simply classified. In today's media environment, individuals are likely to repeatedly encounter different consequences experienced by media figures due to their actions, which in turn may trigger changes in their cognition and behavior.³² For example, Mayrhofer and Naderer found that the depiction of positive consequences of alcohol consumption in movies or TV shows increases the positive expectations and attitudes towards alcohol among individuals with low alcohol consumption.³³ These studies demonstrate that observing altruistic behavior in individuals with positive consequences can effectively promote prosocial behavior in observers. Based on these research findings, it can also be argued that exposure to punitive consequences of prosocial behavior will largely deter individuals

Table 1 Descriptive Statistics

Variables	Experimental Conditions	Mean	SD	t
Gender	Prosocial	0.50	0.50	0.18
	Neutral	0.42	0.50	
Age	Prosocial	16.31	1.38	0.99
	Neutral	16.27	1.41	
Prosocial behavior	Prosocial	9.81	3.48	7.70***
	Neutral	5.70	2.99	

Note: Gender (0 = male, 1 = female), *** $p < 0.001$.

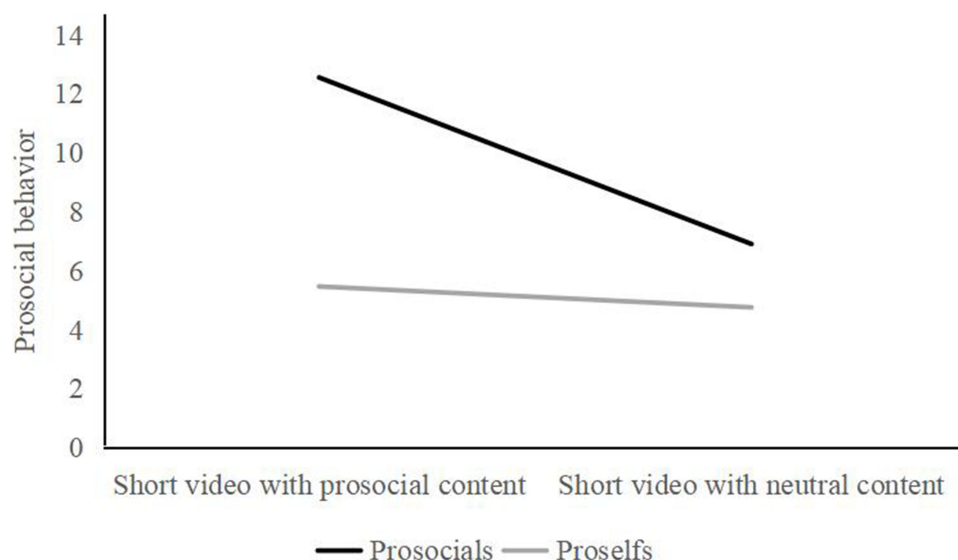


Figure 2 Interaction between short video content and social value orientation.

from imitating similar prosocial behavior. Given the prevalence of such media content, more detailed research needs to be conducted by considering the different consequences of individual exposure to the same prosocial behavior. Since Study 1 has already demonstrated that watching prosocial content in short videos can promote prosocial behavior, in order to further discuss the relationship between short videos and prosocial behavior, we need to further examine the effects of different consequences of prosocial short videos and social value orientation on prosocial behavior based on Study 1.

Study 2

Methods

Research Design

Study 2 further explores the impact of prosocial short videos and social value orientation on prosocial behavior, building upon the findings of Study 1. A 2 (consequences of the prosocial short-form video: reward vs punishment) \times 2 (social value orientation: pro-social vs pro-self) between-subjects factorial design was employed for this investigation. The dependent variable is the participant's donation behavior.

Participants

Through convenient sampling methods, we recruited middle school students from two middle schools in Shanghai, China (middle schools affiliated with the corresponding author's institution) as participants in this study, and study 2 participants were not duplicated with Study 1 participants. Before initiating participant recruitment, we determined the minimum sample size using G*Power. The calculations indicated that to achieve a medium effect size of 0.20 with a minimum power of 0.8,⁵¹ a total of 144 participants was required. Ultimately, 160 students participated in our laboratory experiment at Tongji University from April to June 2023. Following the same data exclusion criteria as in Study 1, data from 152 participants were deemed valid (Response rate: 95%). Among these participants, the average age was 15.28 years ($SD = 1.46$), with 48.68% identifying as female.

Stimulus

In this study, we aimed to find suitable experimental stimuli. We initially utilized keywords such as “help” and “good deeds” to search for relevant prosocial short videos on online platforms like TikTok, Weibo, and Bilibili. These short videos encompassed but were not limited to instances of strangers helping the elderly and returning lost wallets to their owners. Through rigorous screening, we selected three videos from the search results. The selection criteria had three

aspects: the prosocial content must explicitly mention typical prosocial behavior, the videos had to be clear and discernible, and the subtitles needed to be easily re-edited.

Subsequently, we hired a professional video editor to edit these three short videos. Each video had two versions, corresponding to one of the two conditions in our study: the reward condition and the punishment condition. In order to minimize the potential influence of other factors, all elements of the short videos remained unchanged except for the subtitles that appeared on the screen at the end of the videos. Finally, all two versions under the same condition were assigned to the same group: the reward group and the punishment group (for stimulus details, see [Appendix Table 1](#)).

Pilot Testing of Videos

To guarantee the effectiveness of these short videos, we conducted a pilot test. We recruited 32 participants and randomly assigned them to reward and punishment conditions. Then, we asked participants to rate the extent to which they agreed that (1) the helper in the short video received a reward and (2) the helper in the short video was punished. Participants were asked to rate using a five-point scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). Additionally, they were asked to evaluate the objectivity, credibility, relevance, and entertainment value of the short video. The results showed that, compared to those in the punishment group ($M=1.32$, $SD=1.45$), participants in the reward group ($M=4.57$, $SD=0.88$) reported significantly higher scores indicating that the helpers received a reward [$t = -5.37$, $p < 0.001$, effect size = 0.80]. Similarly, compared to those in the reward group ($M=1.36$, $SD=0.49$), participants in the punishment group ($M=3.58$, $SD=1.28$) scored significantly higher on the punishment question [$t = 6.21$, $p < 0.001$, effect size = 0.75]. There were no significant differences in the objective, credibility, relevance, and entertainment ratings of the short videos between the two groups. Therefore, the use of this stimulus in our experiment was appropriate.

Measures

Pre-Experimental measures

Demographics: Consistent with Study 1.

Social Value Orientation: Consistent with Study 1.

Post-Experimental measures

Manipulation Check Question: Subjects were asked to rate, on a five-point Likert scale (1 “Strongly Disagree”, 5 “Strongly Agree”), their level of agreement that (1) the helper in the short video was rewarded, and (2) the helper in the short video was punished.

Procedures

Study 2 received ethical approval from the Ethics Committee of Tongji University. All participants were required to provide informed consent before participation, and the study was conducted anonymously to ensure the protection of participants’ privacy and confidentiality. All participants were informed that the purpose of the experiment was to investigate how watching short videos affects their cognitive abilities. In order to minimize potential harm caused by environmental and other factors, we invited participants to the same lab for the experiment, and each participant’s research procedure was consistent.

First, all participants completed the informed consent form and demographic information, as well as the Social Value Orientation Scale (84 prosocial, 68 pro-self). Then, 84 prosocial and 68 pro-self individuals were randomly assigned to different groups of prosocial short video consequences by randomly drawing group cards. Ultimately, there were 42 prosocial-reward, 42 prosocial-punishment, 34 pro-self-reward, and 34 pro-self-punishment participants. To ensure that participants paid serious attention to the video clips, they were instructed to take a memory test related to the video content after watching.

Following the viewing of the short videos, participants were required to answer manipulation check questions. They were also asked to write down the amount they would donate from a reward fund after reading a genuine charity request. Subsequently, we examined whether participants had any suspicions about the relationship between watching the short

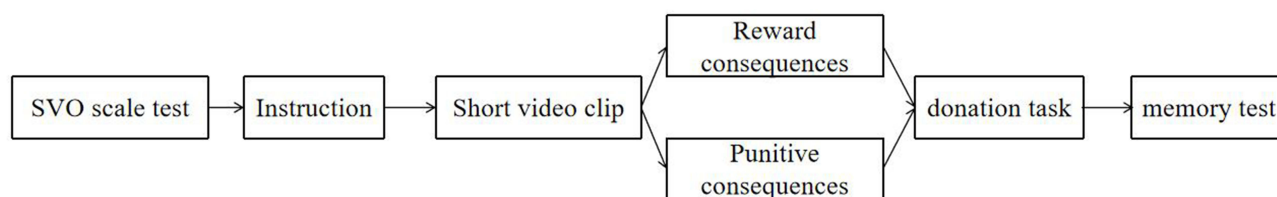


Figure 3 Study 2 Process.

Abbreviation: SVO, Social Value Orientation.

videos and the donation task, and it was found that no one doubted the purpose of our experiment. Finally, we disclosed the true purpose of the study to participants and paid a 15 RMB subject fee. See [Figure 3](#) for details.

Results

Manipulation Check and Descriptive Statistics

The study findings revealed that participants in the reward condition ($M = 4.52$, $SD = 0.73$) reported significantly higher rewards for the helper in the short video compared to participants in the punishment condition ($M = 3.11$, $SD = 1.08$, $t = 11.63$, $p < 0.001$, effect size = 0.61). Additionally, participants in the punishment condition ($M = 3.81$, $SD = 1.26$) scored significantly higher when answering the question “to what extent do they agree that the helper in the short video received punishment” compared to the reward condition ($M = 1.33$, $SD = 0.71$) [$t = -13.42$, $p < 0.001$, effect size = 0.77]. These results indicate successful manipulation of prosocial behavior consequences in the video clips. Furthermore, no significant differences were found in participant gender and age across different experimental conditions. These results suggest that these factors were roughly evenly distributed across different experimental conditions. The descriptive statistics for each condition are presented in [Table 2](#).

Two-Factor Analysis

Shapiro–Wilk test showed that p in all groups was greater than 0.05, which followed normal distribution, and ANOVA could be used. The analysis of variance results for the two factors related to participants’ prosocial behavior (consequences: reward, punishment; social value orientation: prosocial, pro-self) indicate that the main effect of consequences is significant, $F(1, 151) = 18.52$, $p < 0.001$, $\eta^2 = 0.11$. Participants’ donation amount after watching prosocial short videos with a reward consequence ($M = 9.19$, $SD = 2.62$) is significantly higher than after watching a punishment consequence ($M = 7.55$, $SD = 1.36$, effect size = 0.37). The main effect of social value orientation is also significant, $F(1, 151) = 161.29$, $p < 0.001$, $\eta^2 = 0.54$, with prosocial individuals donating significantly more ($M = 10.84$, $SD = 3.55$) than pro-self individuals ($M = 5.91$, $SD = 2.13$, effect size = 0.64). There is a significant interaction between consequences and social value orientation, as prosocial individuals show no significant difference in prosocial behavior after watching reward ($M = 11.10$, $SD = 2.33$) and punishment consequences ($M = 10.50$, $SD = 2.60$, effect size = 0.12), while pro-self individuals exhibit significantly higher prosocial behavior after watching a reward consequence ($M = 12.54$, $SD = 3.02$) compared to watching a punishment consequence ($M = 6.88$, $SD = 3.25$, effect size = 0.67). See [Figure 4](#) for details.

Table 2 Descriptive Statistics of Study 2

Variables	Experimental Conditions	Mean	SD	t
Gender	Reward	0.47	0.50	0.40
	Punishment	0.50	0.50	
Age	Reward	15.29	1.73	0.32
	Punishment	15.18	1.80	
Prosocial behavior	Reward	9.39	2.75	2.77**
	Punishment	7.87	3.94	

Note: Gender (0 = male, 1 = female), ** $p < 0.01$.

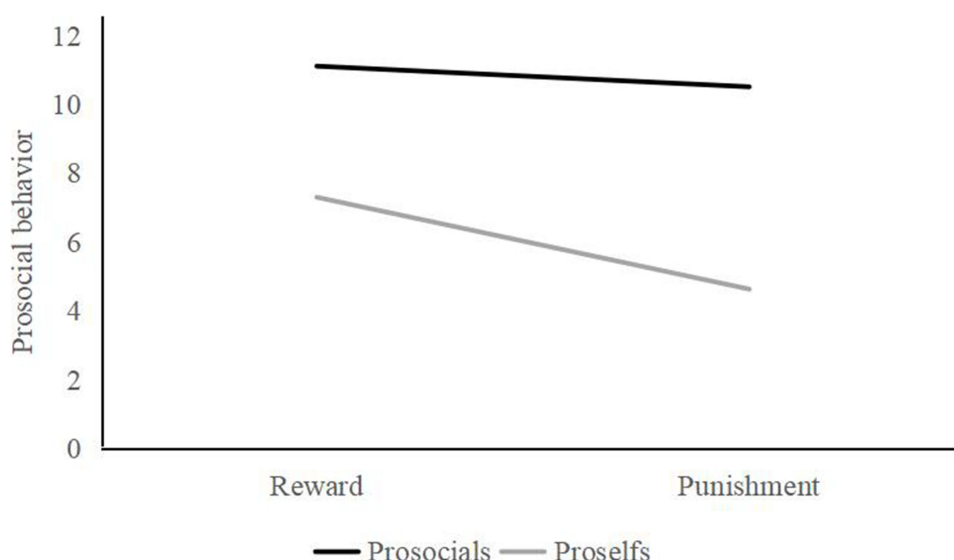


Figure 4 Interaction between prosocial short video consequences and social value orientation.

Through Study 1, we found that viewing prosocial content in short videos can enhance individual prosocial behaviors. However, this facilitating effect exhibits individual differences and is only effective for prosocial individuals. In Study 2, we further uncovered the complexities surrounding how prosocial short videos influence individual prosocial behaviors. Specifically, the rewarding consequences of prosocial short videos tend to motivate pro-self individuals to exhibit more prosocial behaviors, while punitive consequences decrease the prosocial behavior levels of pro-self individuals. In contrast, prosocial individuals demonstrate relatively stable prosocial behavior under both rewarding and punitive conditions, with no significant differences observed.

Discussion

This study examined the effects of different types of short videos and the consequences of prosocial behaviors in the context of short videos on the prosocial behavior of adolescents. Study 1 found that compared to neutral content short videos, prosocial content short videos significantly increased individual prosocial behavior. There was an interaction effect between the content of short videos and adolescents' social value orientation, showing that the promotion effect of prosocial content short videos on prosocial behavior was mainly for prosocial individuals rather than prosocial egoists. Study 2 found that compared to punishment consequences, observing reward consequences significantly predicted individual prosocial behavior. Additionally, punishment consequences had a significant negative impact on individual prosocial behavior. Furthermore, there was an interaction effect between the prosocial short video consequences and social value orientation, where prosocial individuals showed no significant difference in prosocial behavior after viewing reward and punishment consequences, while prosocial egoists exhibited significantly higher prosocial behavior after viewing reward consequences compared to punishment consequences. Further discussion on the main findings is provided below.

Study 1 found that individuals promote prosocial behavior by watching prosocial short videos. However, differences exist among individuals with various social value orientations. This result confirms Research Hypothesis 1. We believe Study 1 conveys two key points. First, similar to traditional media such as films,¹⁷ television,²⁰ music,²¹ and video games,²² the impact of prosocial short videos can enhance prosocial behavior. In the digital age, considering the convenience and ubiquity of smartphone use among adolescents, we assert that our current research significantly discusses the influence of short videos on prosocial behavior. On one hand, as opposed to traditional technologies like television or music, short video platforms provide interactive and dynamic environments. These environments can shape adolescents' attitudes and behaviors in complex ways.³⁰ The social functionalities of short videos can cater to the social needs of adolescents, which may contribute to fostering a prosocial atmosphere within this demographic. However, it is

important to note that adolescents possess immature cognitive abilities and lack proficiency in distinguishing between truth and falsehood, coupled with the inconsistent quality of short video content that is saturated with misleading material. Unlike media formats such as films and television, the content of short videos poses greater challenges for regulation.⁵⁸ Consequently, a potential issue arises: in addition to prosocial short videos, there is a propensity for the widespread dissemination of antisocial or even counterproductive content among youth, which undermines the development of prosocial behaviors and adversely impacts their mental health.⁵⁹ People tend to get information faster through new media. Traditional media is playing less of a role in the media-influenced society and suffering a huge impact brought by new media.⁶⁰ Consequently, this study aims to raise awareness about the growing influence of short video formats on adolescent behavior. While promoting the creation of high-quality short video content to enhance prosocial behavior among youth, it is also crucial to guard against the potential adverse effects of harmful short videos on adolescents' prosocial conduct. People tend to get information faster through new media. Traditional media is playing less of a role in the media-influenced society and suffering a huge impact brought by new media.⁶⁰

Additionally, prosocial short videos do not equally enhance pro-social behavior in all individuals, as significant differences exist between individuals with varying social value orientations. This study posits that the individual differences in pro-social behavior induced by pro-social short videos are related to the intrinsic motivations of individuals with differing social value orientations. According to the social value orientation theory,⁴⁴ prosocial individuals, out of an internal helping motivation, pay attention to both their own and others' benefits. After watching short videos with prosocial content, prosocial individuals are more likely to generate empathy and morality³⁰ and exhibit prosocial behavior. Pro-self individuals, on the other hand, will focus more on their own benefits and are more likely to exhibit prosocial behavior driven by external motivations.⁶¹

The second study revealed significant differences in the impact of prosocial short video consequences on the prosocial behavior of individuals with varying social value orientations, indicating an interaction effect between the two factors. This result corroborates research hypothesis 2. Specifically, the facilitative effect of reward consequences on prosocial behavior was observed exclusively among individuals with an egotistical orientation rather than those with a prosocial orientation. This finding can be elucidated through the long-term influence of moral education in China. Based on the SCT⁴⁷ and previous empirical studies,^{34,49} Chinese primary and secondary school students typically receive moral education based on the national curriculum in school environments.⁶² The textbooks used in moral education courses present various moral role models aimed at encouraging children to emulate their prosocial behaviors.⁶³ This long-term moral education may lead to two social psychological consequences. One consequence is desensitization to prosocial media content, referring to a reduction in cognitive or emotional responses to repeated exposure to moral-related media content.⁶⁴ Therefore, in this study, when prosocial individuals were exposed to the rewarding consequences of prosocial behavior, their emotional arousal was difficult to trigger. Another possible consequence is the internalization of social norms.⁶² After prolonged moral education, individuals with a prosocial orientation gradually internalize social norms, such as the social responsibility to help those in need, into their personal beliefs, possibly viewing altruistic actions as being driven by intrinsic motivation rather than external rewards and incentives. Research indicates that prosocial behavior driven by personal norms is not influenced by external environmental stimuli.⁶⁵ Thus, in our experiment, when prosocial individuals witnessed prosocial behavior incentivized by external rewards, their behavioral response was minimal or absent.

Furthermore, the punishment consequences exhibit significant variation in their impact on individuals with different social value orientations. Specifically, the repercussions of punishment have a markedly negative effect on the prosocial behaviors of those with a self-benefiting orientation, while showing no significant impact on those with a prosocial orientation. This study posits that the underlying explanation for this finding may stem from the differences in motivational drivers between prosocial individuals and those who are self-serving. For prosocial individuals, the maximization of common interests is the optimal consequence, and the display of prosocial behavior is driven by an intrinsic motivation, unaffected by the consequences of either reward or punishment. Therefore, even when exposed to "staged accidents" content in short videos, their level of prosocial behavior remains high.²⁹ For egoistic individuals, on the one hand, self-interest maximization is the optimal solution, and the display of selfish behavior is also driven by an intrinsic motivation. Once negative results of social behavior are detected, more attention is given to protecting oneself

from potential harm, thereby reducing prosocial behavior. On the other hand, egoistic individuals may exhibit negative biases in the face of punitive consequences. Negative bias is a cognitive bias, where individuals tend to engage in rapid autonomous cognitive processing, paying more attention to negative information than positive information.⁶⁶ More importantly, compared to positive events, negative events often trigger more prominent and intense emotional responses in individuals.⁶⁷ Therefore, egoistic individuals are more likely to be stimulated to protect their self-interest under punishment stimuli than under reward stimuli, thereby reducing prosocial behavior.

Implications and Limitations

Our research has made several theoretical contributions. Firstly, it complements the understanding of the impact of short videos as a new form of social media on prosocial behavior, while also focusing on individual differences in the impact of such behavior. This has led to a deeper understanding of how prosocial content influences people's engagement in prosocial behavior. Secondly, by focusing on the different consequences of the media portrayal of the same prosocial behavior, it has provided a more nuanced view of the influence of media exposure on subsequent prosocial behavior in adolescents. We have distinguished between the rewarding and punitive consequences of the same prosocial behavior and examined altruistic consequences following exposure to both types of consequences. Additionally, we have examined individual differences in prosocial behavior consequences based on different social value orientations. To the best of our knowledge, our study represents the first attempt to investigate this important topic within the context of short videos. Given the unique nature of prosocial media and its increasing prevalence in people's lives, our research goes beyond the focus of most existing studies on traditional media backgrounds, enriching and expanding the current knowledge about the effects of prosocial media exposure. Finally, our research findings provide support for the application of social cognitive theory and social value orientation theory in this study, thereby offering new evidence to support the explanatory power of these theories in a new context.

Our research also offers some insights for practical application. Considering that the consequences of pro-social behavior punishment can reduce adolescents' pro-social behavior, parents and practitioners (such as school teachers) can take measures to develop their morality and behavior in a more pro-social way. For example, it is necessary to prevent adolescents from frequent exposure to short videos containing corresponding punishment content, and when they are found to excessively consume such media content, psychological intervention is needed to mitigate the negative consequences. Conversely, individuals with a pro-self-value orientation among students can be exposed to pro-social short videos containing rewarding content through corresponding media publicity, and targeted moral education can be conducted based on their individual situations.

This research has several limitations. Firstly, the study characterizes prosocial behavior using donation behavior. Since there are other types of prosocial behavior, such as helping and sharing,⁶⁸ future research needs to consider more comprehensive measures of prosocial behavior. Secondly, the study explores the influence of short video type, consequences, and social value orientation on prosocial behavior, but the underlying mechanisms of these influences still need further exploration. For example, the moderating role of empathy provides a profound understanding of the interaction between the moral emotions and empathy triggered by short videos on prosocial behavior. According to Zuffianò et al, they found a positive correlation between moral elevation and prosocial behavior in adolescents with low empathy, but this relationship weakens in adolescents with high empathy.⁶⁹ In other words, the impact of punitive consequences on adolescent prosocial behavior depends on empathy levels, which helps researchers to understand its potential mechanisms at a more nuanced level. Thirdly, this study did not address the influence of moral emotions triggered by short videos on prosocial behavior. Considering that prosocial behavior may be one aspect of the multi-dimensional structure of moral emotions, future research is necessary to consider moral emotions, such as guilt or disgust, as potential intervening variables to obtain a more comprehensive understanding of the underlying mechanisms. Lastly, data collection was confined to two public middle schools in Shanghai, China, limiting the generalizability of findings to other regions. Given that Shanghai represents one of China's largest and most advanced areas, careful consideration is necessary when extending results to less developed regions. Future research should adopt a more comprehensive geographical approach, encompassing both urban and rural areas within China.

Conclusions

This study aims to investigate how external (short video content and consequences) and internal factors (social value orientation) affect adolescents' prosocial behavior. Two experimental designs reveal that short video content interacts with social value orientation, influencing prosocial behavior. Prosocial videos enhance prosocial behavior in prosocial individuals, but not in pro-self individuals. Furthermore, the consequences of prosocial short videos do affect pro-self individuals: rewards increase their prosocial behavior, while punishments decrease it. In contrast, prosocial individuals show stable behavior across both rewarding and punitive scenarios, with no significant differences observed.

Data Sharing Statement

The datasets generated and/or analyzed during the current study are not publicly available due to limitations of ethical approval involving patient data and anonymity but are available from the corresponding author upon reasonable request.

Ethics Approval

This study followed the principles of the Declaration of Helsinki and received approval from the Ethics Research Committee of Tongji University (#20210402). All study participants provided informed consent before participating in the research, and the study procedures were formulated to safeguard participant privacy and ensure confidentiality. This study confirmed that a parent or legal guardian of participants under 18 years of age provided informed consent.

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Disclosure

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