

# Imagination Matters When You Shop Online: The Moderating Role of Mental Simulation Between Materialism and Online Impulsive Buying

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**Background:** Several studies have demonstrated that materialistic people tend to engage in impulsive buying. However, how to help them reduce such irrational behavior, especially in online shopping context, is not known. This study aimed to explore whether mental simulation moderates the relationship between materialism and online impulsive buying.

**Methods:** A total of 200 Chinese college students participated in the experiment. We adopted an imaginary priming paradigm to manipulate three types of mental simulation: process simulation (i.e., imagining the detailed process of purchasing goods), upward outcome simulation (i.e., imagining possible positive outcomes after purchasing), and downward outcome simulation (i.e., imagining possible negative outcomes after purchasing). Then we asked participants to make purchase decisions in a simulated online store.

**Results:** Results showed that mental simulation exerted a significant moderating effect. In the upward outcome simulation group, a higher level of materialism predicted more online impulsive buying. However, this association was not significant in the downward outcome simulation and process simulation groups.

**Conclusion:** Our findings have implications for interventions in that mental simulation (process simulation or downward outcome simulation) can act as an effective way to help materialists reduce online impulsive buying.

**Keywords:** materialism, online impulsive buying, mental simulation, moderation

## Introduction

With the rapid development of the Internet, online shopping is becoming increasingly popular. However, there seems to be a return boom of goods after each seasonal sale (e.g., the shopping festival on Nov 11 every year in China), which is mainly caused by the consumers' impulsivity. Online impulsive buying, an academic concept associated with this phenomenon, refers to the impulsive buying behavior through the Internet. Impulsive buying is a kind of unplanned, sudden, thoughtless, and hedonic purchasing behavior, which is considered as an irrational consumer behavior done without careful consideration of potential adverse consequences of buying.<sup>1,2</sup> Impulsive buying has a potentially negative impact on both individuals and society. For individuals, it may lead to negative emotions such as regret, guilt, and dissatisfaction as well as economic problems such as overspending or even overdraft.<sup>3</sup> For society, it is not conducive to resource conservation, ecological environmental protection, and sustainable development. Moreover, consumers are more likely to be impulsive in online shopping situations than in

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traditional physical stores.<sup>4</sup> Therefore, it is necessary to explore the factors influencing online impulsive buying and take appropriate actions to reduce this behavior.

Throughout the previous studies, materialism has been widely recognized as an important psychological factor affecting impulsive buying. Materialism is a value that emphasizes material wealth as the center of life, the source of happiness, and the criterion for success in personal life.<sup>5</sup> Many studies have shown that materialism correlates positively with impulsive buying.<sup>6–12</sup> However, these studies mainly focused on a traditional purchase situation; only a few studies have demonstrated a positive correlation between materialism and online impulsive buying tendency.<sup>13</sup> Thus, the relationship between materialism and online impulsive buying needs further examination. More importantly, there is a lack of research about the moderating factors, so it remains unclear how we can reduce online impulsive buying among materialists. When shopping online, consumers cannot see, touch, or try on real goods, and can only make purchase decisions by observing models, reading the product description, and then using imagination. Therefore, this mode is completely different from a traditional physical store purchase situation. Mental simulation is an approach that can help consumers make decisions by using imagination.

The concept of mental simulation, proposed by Taylor and Schneider,<sup>14</sup> refers to the imitative representation of some event or series of events. It may involve the replay of events that have already happened, the cognitive construction of hypothetical scenarios, fantasies, and mixtures of real and hypothetical events. Taylor et al<sup>15</sup> particularly emphasized that mental simulation, as an effective self-regulating mechanism, could construct a path that makes individuals preview the future by providing a clear vision of the future, thereby facilitating the connection between thought and action. They classified mental simulation into two types: process simulation and outcome simulation. More specifically, process simulation refers to the imagination of concrete steps that people would take to achieve a given goal, whereas outcome simulation refers to the imagination of expected results when achieving the goal. For example, a person who wants to lose weight and imagines the ideal weight or body shape after successful weight loss belongs to the outcome simulation group, while a person imagining how to make an exercise plan, diet menu, daily exercise schedule, and so on, belongs to the process simulation group. Other researchers<sup>16</sup> later pointed out that mental simulation may not necessarily

be directed towards the future. For instance, one could simulate how the past could have turned out differently (i.e., counterfactual simulation). Similarly, Sanna<sup>17</sup> defined mental simulations as imitative cognitive constructions of hypothetical events or reconstructions of real events, including anticipations about the future (prefactual simulation) and retrospections about the past (counterfactual simulation). Regarding simulation direction, both simulations could be either upward (thinking about positive outcomes) or downward (thinking about negative outcomes). By analyzing the above concepts and considering the aim of this study, we adopted the concept of mental simulation directed towards the future and divided mental simulation into three types: process simulation, upward outcome simulation, and downward outcome simulation.

Research shows that mental simulation technique has wide applicability in many fields, such as promoting physical health,<sup>18</sup> reducing alcohol dependence,<sup>19</sup> improving academic performance,<sup>20</sup> and promoting advertisements.<sup>21–23</sup> The purpose of most advertisements is to trigger more purchases by making consumers imagine an improved life after they use the product. For example, after using some kind of shampoo, one would enjoy smooth and bright hair. This outcome-oriented imagination may contribute to further purchases by consumers. Thus, it is clear that online impulsive buying is closely related to mental simulation. However, different types of mental simulation work differently. Process simulation focusing more on cognition encourages people to imagine specific processes and steps of purchasing, and such an approach can reduce impulsive buying since it can improve consumers' ability to plan and rationally analyze the purchase.<sup>24</sup> Unlike process simulation, outcome simulation that focuses more on emotions leads people to imagine various outcomes they expect, such as a charming image, praise, and envy from friends, thus greatly stimulating consumers' desire to buy a product when they face temptation. It has been demonstrated that upward outcome simulation makes consumers pay more attention to the pleasure produced by buying rather than supervise their behavior, and this attitude promotes impulsive buying.<sup>24</sup> However, there is little research on the role of downward outcome simulation in the shopping context. Nevertheless, some literature for upward and downward mental simulation can be found in other domains such as academic performance, health, and self-perceptions. For example, Spiegel et al<sup>25</sup> found that promotion-focused (a concern with positive outcomes) students were more likely to finish their reports and ate more fruits and vegetables than their prevention-focused (a concern with negative outcomes) counterparts.

Markman et al<sup>26</sup> demonstrated that participants who received the feedback that their performance on a verbal intelligence test was improving subsequently rated themselves as higher in verbal intelligence than participants who received the feedback indicating worse performance. Furthermore, within the context of status momentum, Pettit et al<sup>27</sup> found that participants who were exposed to an ascending rank scenario subsequently developed enhanced perceptions of feelings of acceptance from others than those who were exposed to a descending rank scenario, even though the final rank itself was held constant. These studies indicate that simulations allow people to “preview” events and “pre-feel” the pleasures and pains that those events will produce, thus affecting judgments and decision-making.<sup>28</sup> Therefore, we can speculate that in the context of shopping, contrary to the effect of upward simulation, the downward simulation will elicit negative emotions, thereby inhibiting impulse buying.

Through the literature review, we know that mental simulation is a key factor affecting impulsive purchases, especially online impulsive buying. Therefore, can different types of mental simulation improve or reduce the materialists' impulse buying behavior? In other words, does mental simulation play a moderating role between materialism and online impulsive buying? This is the core concern of this study.

China is experiencing an era of materialism. A French market research company, Ipsos, released a global survey on materialism among 20 countries in 2016, showing that the Chinese ranked at the top of the list regarding the pursuit of material wealth. Therefore, based on the prevalence of materialism in China, this research aimed to examine the moderating role of mental simulation between materialism and online impulsive buying among Chinese college students. This study also extended the previous studies in several aspects. Firstly, we further tested the relationship between materialism and online impulsive buying. Secondly, this study was the first to propose the moderating role of mental simulation, and that it could help us understand ways to reduce online impulsive buying for materialists. Thirdly, we compared the effects of upward and downward outcome simulations in the context of shopping, which could expand the application of mental simulation. Finally, regarding the research method, previous studies on materialism and impulsive purchase mostly used a self-report method to measure impulsive buying tendency, which did not necessarily represent the actual purchase behavior. In the present study, we set up a simulated online store to measure impulsive purchase

behavior based on the actual order data submitted by the participants. This approach was closer to the real shopping situation and could improve the ecological validity of the study.

We hypothesized that mental simulation would moderate the relationship between materialism and online impulsive buying. Under the condition of upward outcome simulation, individuals with higher levels of materialism were expected to engage more in online impulsive buying. Under the condition of downward outcome simulation or process simulation, the relationship between materialism and online impulsive buying was expected to be weak or absent.

## Method

### Participants

After obtaining the ethical approval from the Research Ethics Committee of Central China Normal University, we recruited 205 college students in Wuhan (a capital city of Hubei Province in China) through an advertisement on a public social network platform. All participants provided written informed consent and were assured of the confidentiality of their responses. After removing 5 participants who were not well engaged in the experimental task, the final sample consisted of 200 participants (36 males; 164 females) with a mean age of 20.16 years ( $SD=1.65$ ). All of them had online shopping experiences, with 95% of them having more than one year of experience.

### Materials and Procedures

Before the formal experiment, we designed an online store with two types of goods: jackets and sneakers (men and women respectively occupied one half) that were popular and top-selling among college students based on the big data of Taobao shopping site. The interface of this online store included discounted advertisements and detailed product information.

After the participants arrived at the laboratory, they were told that they would participate in a simulated online shopping experiment, which meant that they could not obtain the goods. Then, they were asked to open a web page on the computer, where they were required to read and imagine the following simulated scenario:

You are a college student and your parents give you enough living expenses every month. Because of the needs of life, you are going to buy a jacket on the online shop you usually visit. When you are browsing jackets, you find a pair of sneakers. You really like their brand, style, and

color. Moreover, they happen to be discounted. So maybe you also want to buy the sneakers.

Next, the participants entered the simulated online store and browsed the goods for five minutes. Before making purchase decisions, they were asked to complete an imagination and writing task, which was actually the mental simulation manipulation. Participants were randomly assigned to three groups to receive one of the three mental simulation manipulations. Detailed instructions for the different simulation conditions were as follows:

### Process Simulation

Usually when we buy online because we cannot touch the real goods, we need to consider more details in the purchase process to determine whether to buy this product. Now, please carefully imagine and think about the detailed process of purchasing these goods, such as: how many commodities do you need to buy? Is there enough money? Do you really need to buy these goods? If not, do you have other clothes or shoes to wear? What size should you choose? What kind of express delivery should be selected? Then, please write down your responses to these questions and the scenes you have rationally thought about the purchase process in about 200 words.

### Upward Outcome Simulation

Usually when we buy online because we cannot touch the real goods and try them, we need to rely on imagination (e.g., Imagine if this jacket looks good on you) to determine whether to buy the goods. Now, please carefully imagine various positive outcomes after purchasing, such as good quality, being satisfied, feeling good, having a good image of yourself, getting praise and admiration from people around you. Then, please write down all the good results after purchase that you have imagined in about 200 words.

### Downward Outcome Simulation

Usually when we buy online because we cannot touch the real goods and try them, we need to rely on imagination (e.g., Imagine if this jacket looks good on you) to determine whether to buy the goods. Now, please carefully imagine various negative outcomes after purchasing, such as bad quality, being unsatisfied, feeling uncomfortable, getting bad comments from others, and experiencing regret and guilt. Then, please write down all the bad results after purchase that you have imagined in about 200 words.

Then, we conducted a manipulation test of mental simulation by using a single item: "To what extent were

you involved in the imagination task just now?"<sup>24</sup> Participants responded on a 5-point Likert scale with a higher score representing a higher level of involvement. Apart from that, the content written by the participants in the imagination task was checked to ensure that they had followed the instructions.

Afterwards, the participants had to make purchase decisions according to their thoughts. Participants who chose to buy jackets or sneakers would have a complete online shopping experience, which involved selecting the products, filling in the address, and submitting the order. Participants who chose to buy nothing could close the web page and end the experiment. Online impulsive buying was scored from 1 to 7 based on the actual order data (buy nothing = 1, one jacket = 2, one pair of sneakers = 3, one jacket and one pair of sneakers = 4, two pairs of sneakers = 5, one jacket and two pairs of sneakers = 6, two jackets and two pairs of sneakers = 7).

At last, participants were asked to complete the Chinese version of materialism scale.<sup>29</sup> The scale included 13 items to which participants responded on a 5-point Likert scale (1=strongly disagree, 5=strongly agree); a higher score represented a higher level of materialism. The reliability of the scale in our study was acceptable (Cronbach's  $\alpha = 0.78$ ). They were also required to provide basic demographic information, including gender, age, and online shopping experience. After the experiment, each participant was given a small sum of money (RMB 10) in appreciation.

## Statistical Analyses

SPSS 20.0 was used for data analyses. First, to investigate the general tendency of materialism and online impulsive buying in the whole sample and different mental simulation groups, the mean and standard deviation for each variable, the Pearson correlation coefficients between the variables, and group differences in materialism were analyzed. Next, we used the PROCESS macro (<http://www.alhayes.com>) to conduct moderation analyses.<sup>30</sup> Concretely, we examined the moderating effect of mental simulation on the relationship between materialism and online impulsive buying. It should be noted that mental simulation was a categorical variable; it could not directly enter the regression equation, so we needed to convert it into dummy variables first. In addition, because of the unbalanced gender ratio (females accounted for 82% of all participants) in our study and the gender differences in impulsive buying reported in previous studies,<sup>31</sup> we controlled gender to avoid its extraneous effects on the

dependent variable. We used 1000 bootstrap samples, and biases were corrected at 95% confidence intervals (CI) to calculate the effect of each variable. If the 95% CI did not include zero, then the effect was significant at  $p=0.05$ .

## Results

### Mental Simulation Manipulation Check

Results of the single item test showed that 97.56% of the participants reported being well engaged in the imagination task (scoring 4 or 5,  $M = 4.57$ ). Five participants with a low level of involvement (scoring 3 or below) were excluded from further analysis. For the remaining 200 participants, we checked their written text information and found that all of them were able to follow the instructions of mental simulation, which indicated that the mental simulation manipulation was effective.

### Descriptive Statistics and Correlation Analysis

As shown in Table 1, the correlation between materialism and online impulsive buying was not significant ( $r = 0.13$ ,  $p = 0.06$ ) in the whole sample. In the upward outcome simulation group, materialism was positively associated with online impulsive buying ( $r = 0.57$ ,  $p < 0.001$ ), whereas no correlation was found to be statistically significant in the process simulation and upward outcome simulation groups ( $r = -0.17$ ,  $p = 0.18$ ;  $r = -0.14$ ,  $p = 0.25$ ).

### Analyzing Group Differences in Materialism

Since the measurement of materialism was conducted in the last order, there might be potential confounding between experimental manipulation and materialism level. To test this, we applied one way ANOVA with contrasts, and the results showed significant differences in materialism among the three groups,  $F(2, 197) = 3.38$ ,  $p < 0.05$ . Specifically, materialism in the downward simulation group ( $M = 41.23$ ,

$SD = 7.43$ ) was significantly higher than in the process simulation group ( $M = 38.02$ ,  $SD = 7.02$ ) ( $p < 0.05$ ), but there was no difference between the upward simulation group ( $M = 39.19$ ,  $SD = 7.02$ ) and the downward simulation group ( $p = 0.10$ ), or between the upward simulation group and the process simulation group ( $p = 0.34$ ). These results indicated that the potential impact of experimental manipulation on materialism levels could not be completely excluded. However, because materialism was a relatively stable value, the group differences might also be due to the differences in the participants' level of materialism.

### Moderating Analysis

A PROCESS macro was used to examine the moderating effect of mental simulation on the relationship between materialism and online impulsive buying.<sup>30</sup> First, we converted the categorical variable mental simulation into dummy variables. Taking upward outcome simulation as a reference, we coded upward outcome simulation as (0, 0), downward outcome simulation as (0, 1), and process simulation as (1, 0). In this way, two new dummy variables were produced: variable 1 (upward-process simulation) and variable 2 (upward-downward simulation). In other words, when variable 1 = 0, and variable 2=0, it represented upward simulation; when variable 1 = 0, and variable 2=1, it represented downward simulation; when variable 1 = 1, and variable 2=0, it represented process simulation. Therefore, these two dummy variables could replace three categories of mental simulation.

Then, a regression analysis was conducted with online impulsive buying as a dependent variable, upward-downward simulation and upward-process simulation as moderate variables, materialism as an independent variable, and gender as a control variable. To reduce or control multicollinearity, the independent and moderate variables were mean-centered before analysis, which was done automatically by the PROCESS procedure: Options–Mean center for products. Results showed that the whole model was significant,  $R^2 =$

**Table 1** The Means and Correlations Between Materialism and Online Impulsive Buying in the Whole Sample and Subgroup Samples

Variables	Whole Sample (N=200)		Process Simulation (n=65)		Upward Outcome Simulation (n=69)		Downward Outcome Simulation (n=66)	
	M	SD	M	SD	M	SD	M	SD
Materialism	39.48	7.24	38.02	7.02	39.19	7.02	41.23	7.43
Online impulsive buying	2.61	1.65	2.02	0.80	3.90	1.87	1.85	1.14
Correlations	$r = 0.13$ , $p = 0.06$		$r = -0.17$ , $p = 0.18$		$r = 0.57$ , $p < 0.001$		$r = -0.14$ , $p = 0.25$	

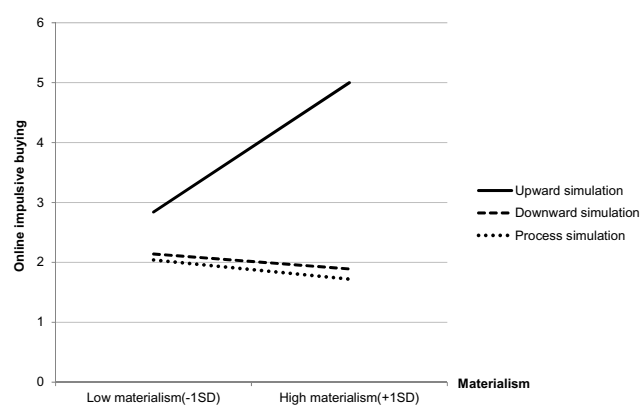


0.48,  $F(6, 193) = 29.58$ ,  $p < 0.001$ . R square changes due to interactions were also significant. For materialism $\times$ upward-process simulation,  $\Delta R^2=0.08$ ,  $F(1, 193) = 30.34$ ,  $p < 0.001$ . For materialism $\times$ upward-downward simulation,  $\Delta R^2=0.09$ ,  $F(1, 193) = 34.67$ ,  $p < 0.001$ . The regression coefficients of all variables and interactions on online impulsive buying were statistically significant (see Table 2).

Finally, the simple slope effect test was conducted. As shown in Figure 1, in the upward outcome simulation group, higher materialism predicted higher online impulsive buying scores (simple slope = 0.15,  $t = 7.08$ ,  $p < 0.001$ ). However, in the downward outcome simulation group, the effect of materialism on online impulsive buying was not significant (simple slope =  $-0.02$ ,  $t = -0.82$ ,  $p = 0.41$ ). A similar pattern was observed in the process simulation group (simple slope =  $-0.02$ ,  $t = -1.10$ ,  $p = 0.27$ ).

## Discussion

The current study was designed to examine the moderator of materialism affecting online impulsive buying. To the best of our knowledge, it was the first study to take mental simulation as the moderator. As expected, the moderating effect of mental simulation between materialism and online impulsive buying was significant. In the upward outcome simulation group, materialism predicted more



**Figure 1** Moderating effect of mental simulation on the relationship between materialism and online impulsive buying.

**Abbreviation:** SD, standard deviation.

online impulsive buying. However, this association was not significant in the downward outcome simulation and process simulation groups. Although previous researches have demonstrated a positive association between materialism and impulsive buying,<sup>6–13</sup> the results of our study indicated that materialism did not necessarily lead to this irrational consumer behavior. In the online shopping environment, individuals who adopted downward outcome simulation or process simulation could be immune from the effects of materialism on impulsive buying. Nevertheless, materialism could increase impulsive buying for those who adopted upward outcome simulation. Similarly, another study on materialism and mental health found that materialism was not necessarily detrimental to mental health, and mindfulness exerted a significant moderating effect.<sup>32</sup> Thus, it is clear that materialism is not necessarily detrimental in any circumstance. In fact, materialism has even been proved to have some positive consequences, such as boosting self-esteem<sup>33</sup> and improving life satisfaction.<sup>34</sup> It is crucial to find the moderators.

What are the potential mechanisms leading to our results? As we know, one of the core components of materialism is to consider the acquisition and possession of materials as the central goal of life, therefore the consumers' level of materialism can reflect the strength of their desire to buy. But will the desire necessarily lead to impulsive buying behavior? According to Hoch and Loewenstein's Desire-willpower Model of Self-control,<sup>35</sup> consumers with purchase impulse do not necessarily make impulsive buying, and consumers will experience a process of self-struggle between desire and willpower. When consumers fail to control their impulse, the impulsive purchase will occur. According to this model,

**Table 2** Online Impulsive Buying as A Function of Materialism and Mental Simulation

	Online Impulsive Buying				
	B	SE	t	p	95% CI
Constant	2.21	0.43	5.15***	< 0.001	[1.36, 3.06]
Control variable					
Gender	0.23	0.23	1.00	0.318	[-0.23, 0.69]
Independent variable					
Materialism	0.04	0.01	3.20**	0.002	[0.02, 0.06]
Moderate variable					
Upward-process simulation	-1.91	0.22	-8.78***	< 0.001	[-2.33, -1.48]
Upward-downward simulation	-2.04	0.21	-9.62***	< 0.001	[-2.45, -1.62]
Interaction					
Materialism $\times$ upward-process simulation	-0.17	0.03	-5.51***	< 0.001	[-0.23, -0.11]
Materialism $\times$ upward-downward simulation	-0.17	0.03	-5.89***	< 0.001	[-0.23, -0.11]

**Notes:** \*\* and \*\*\* indicate statistically significant.

consumers can increase willpower through some strategies, such as economic cost assessment and anticipated regret and guilt.<sup>35</sup> In that way, process simulation and downward outcome simulation can improve the planning and rational analysis ability of consumers' purchase, and increase the willpower part of the desire-willpower model, thus helping to reduce impulsive purchase; on the contrary, upward outcome simulation makes consumers pay more attention to the enjoyment produced by the purchase, neglect to supervise their own behavior, increase the purchase desire, and thus promote impulsive buying.<sup>24</sup>

Another contribution of this research is that we compared the effect of upward outcome simulation and downward outcome simulation in the context of shopping. Although many researchers have investigated these two types of simulation, they mainly focused on other domains such as academic performance, health, and self-perceptions.<sup>25-27</sup> In the domain of purchase, researchers generally considered the upward outcome simulation only,<sup>24</sup> and there was little empirical research exploring the role of downward outcome simulation. To the best of our knowledge, this is the first study to identify that like process simulation, downward outcome simulation could also help inhibit impulsive buying, thereby expanding the application of mental simulation.

Additionally, our findings have important practical implications for interventions to help materialists reduce online impulsive buying. Because consumers cannot see, touch, or try on real goods when they shop online, their decision whether to buy or not largely depends on imagination. According to our findings, materialistic consumers should be encouraged to adopt a process simulation or downward outcome simulation instead of upward outcome simulation, that is, try to imagine the detailed purchase process or possible negative results after shopping, which is conducive to rational consumer behavior. Thus the two kinds of mental simulation—process simulation and downward outcome simulation—can function as simple and effective intervention mechanisms for materialists to inhibit their online impulsive buying. Furthermore, we can generalize our results to pathological buying online as potential target for mental simulation. Previous studies already emphasize the importance of specific expectancies in association with online pathological buying, such as buying availability and reaching a greater product variety and receiving immediate positive feelings.<sup>36,37</sup> As Trotzke et al proposed in his research, self-monitoring techniques and cognitive restructuring could be applied to change the emotional and cognitive conditions to establish new healthy buying patterns.<sup>37</sup> Thus, mental

simulation, as an effective self-regulating mechanism, could also be applied to online pathological buying.

The current study has several limitations that could be addressed by future research. First, online impulsive buying was measured in the laboratory through a simulated online store. This approach probably increased the authenticity of the experiment, but there was still a gap between the simulated shopping scene and the real online shopping situation. For example, participants could not obtain the bought goods, which might have influenced their buying behaviors in the experiment. Thus, future research could create a more elaborate and real situation to further improve the ecological validity of the research. Second, the measurement of materialism was conducted in the last order, which could lead to potential confounding between experimental manipulation and materialism level. Although materialism was a relatively stable value, the potential impact of experimental manipulation on materialism level could not be completely excluded. Therefore, it would be better to measure materialism in the first order, before the experimental manipulation. Third, we only focused on impulsive buying based on commodity categories in this research. Future studies could consider other forms of impulsive buying, such as impulsive buying in terms of commodity grades. Finally, the hypothesis was tested only in college students, which limited the generalization of the results. Although college students tend to buy impulsively, their living expenses mainly come from parents, and they have no independent source of income. Therefore, it is necessary to replicate our research in other adult samples.

## Conclusion

The current study examined the moderation of mental simulation on the relationship between materialism and online impulsive buying using the experimental method among Chinese college students. Results showed that mental simulation exerted a significant moderating effect. Among those who adopted upward outcome simulation, materialism predicted more online impulsive buying, while among those who adopted downward outcome simulation or process simulation, this association was no longer significant. Our findings indicated that process simulation and downward outcome simulation could serve as simple and effective intervention mechanisms for materialists to inhibit their online impulsive buying. Moreover, these two types of mental simulation might have potential application value for online pathological buying.

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## Disclosure

The authors report no conflicts of interest in this work.

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