

# Self-Esteem and College Students' Online Impulse Buying: The Independent and Interactive Moderating Role of Interdependent Self-Construal and Interpersonal Relationships

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**Purpose:** Despite the extensive research examining the antecedents and consequences of impulse behavior, empirical studies exploring the role of self-esteem in college students' online impulse buying remain relatively scarce. Drawing on the theory of compensatory consumption, the current study aimed to examine the influence of self-esteem on college students' online impulse buying and the independent and interactive moderating role of interdependent self-construal and interpersonal relationships.

**Patients and Methods:** This study recruited 323 college students through random sampling and invited them to complete self-reported questionnaires measuring self-esteem, online impulse buying, interdependent self-construal, and interpersonal relationships. To test the research hypotheses, SPSS 27.0 was used for reliability analysis, correlation analysis, tests of convergent and discriminant validity, hierarchical linear regression analyses, and simple slope analyses to examine moderation effects.

**Results:** The study found that self-esteem is negatively associated with online impulse buying among college students. More importantly, interdependent self-construal strengthens this negative relationship, with the effect being significantly stronger for students who exhibit higher levels of interdependent self-construal. Furthermore, a three-way interaction revealed that the inhibitory effect of self-esteem on online impulse buying is strongest when students have both high interdependent self-construal and low-quality interpersonal relationships, compared to other combinations of these factors.

**Conclusion:** This study enhances our understanding of the relationship between self-esteem and online impulse buying by examining the moderating effects of interdependent self-construal and interpersonal relationships. Specifically, the inhibitory effect of self-esteem on online impulse buying is strongest among college students with low-quality interpersonal relationships and a high level of interdependent self-construal. These findings explore how interpersonal factors shape the relationship between self-esteem and online impulse buying, offering practical guidance for preventing and intervening in online impulse buying among college students.

**Keywords:** online impulse buying, self-esteem, interdependent self-construal, interpersonal relationships, college students

## Introduction

College students currently represent the primary demographic engaging in online shopping in China, with 76.5% of students making at least one online purchase per week, 40% to 80% of these purchases are considered irrational and spontaneous.<sup>1,2</sup> Impulse buying is an irrational, unplanned, yet prevalent and frequent shopping behavior.<sup>3</sup> Impulsive buying behavior typically occurs in traditional shopping environments.<sup>4</sup> With the rapid development of e-commerce, online impulsive buying has also become a prevalent phenomenon. Online impulse buying refers to the spontaneous and unplanned act of purchasing a product or service in an online shopping environment, driven by a sudden psychological urge to buy, often accompanied by immediate gratification.<sup>4</sup> This behavior typically occurs without prior intention or deliberation, and the urge to act can be

powerful and sometimes irresistible. Such as a college student is driven by a 24-hour flash sale and the fear of missing out to impulsively purchase a product, despite having no prior intention to buy it. Although it can provide individuals with short-term pleasure,<sup>5,6</sup> in the long run, it can lead to negative emotions such as self-blame and guilt, as well as corresponding debt,<sup>7,8</sup> and even pose significant threats to students' lives and mental health.<sup>9</sup> Existing research suggests that online impulse buying is primarily influenced by external factors such as product promotions and customer reviews, as well as individual's internal factors such as emotional states and trait self-control.<sup>10-12</sup> Although self-esteem, as an individual's overall sense of self-worth or personal value, serves as an important foundation for effective self-regulation and controlling irrational behaviors, the relationship between self-esteem and online impulse buying has been largely overlooked. This overlook hinders a comprehensive understanding of how self-esteem impacts irrational consumption behavior among college students in the context of the digital age. Furthermore, understanding the relationship holds practical significance for effectively inhibiting or managing impulse buying among college students in an internet environment. Therefore, this study aims to explore the influence of self-esteem on online impulse buying to achieve a more comprehensive understanding of college students' irrational behaviors in the internet era.

Self-esteem refers to an individual's overall assessment of their personal worth or abilities.<sup>13</sup> From the perspective of compensatory consumption theory, when an individual's basic psychological needs are unmet, they may engage in consumption behavior as a means of seeking compensation or self-affirmation. Research has shown that individuals with high self-esteem typically possess stronger emotional self-regulation skills and a more intrinsic sense of self-worth, making them less likely to compensate for perceived deficiencies in their self-value through material consumption.<sup>14</sup> In contrast, individuals with low self-esteem are more likely to seek temporary psychological satisfaction through consumption.<sup>14</sup> In other words, when self-esteem levels are higher, university students' need for material consumption may decrease, thus inhibiting impulsive buying behavior. Those with higher self-esteem tend to be more confident and independent, which enables them to manage emotions and control impulse buying more effectively.

It is noteworthy that in collectivist cultures, where group harmony, interdependence, and social relationships are emphasized, cultural factors play a pivotal role in shaping self-esteem and consumption behaviors.<sup>15,16</sup> Self-esteem in such contexts is often contingent upon social approval and the fulfillment of group expectations.<sup>17</sup> At the same time, individual consumption decisions are likely to reflect collective values that emphasize responsibility, self-discipline, and the restraint of irrational behaviors to maintain group harmony and uphold other cultural norms.<sup>15,18,19</sup> Consequently, individuals with high self-esteem in a collectivist cultural context may be more likely to exercise self-control and inhibit impulsive buying behaviors, as such restraint aligns with the expectations of group members regarding responsibility, self-discipline, and other cultural values. However, how the relationship between self-esteem and online impulse buying among college students is shaped within a collectivist cultural context remains unclear.

Building on this, we used the theory of compensatory consumption to explain how the relationship between self-esteem and online impulse buying depends on college students' self-concept in a collectivist culture. This theory posits that an individual's self-concept influences the process and decisions involved in compensation.<sup>20</sup> Self-esteem is a core component of self-evaluation and, along with self-construal, constitutes two crucial aspects of the self.<sup>21</sup> Both factors jointly influence an individual's consumption decisions.<sup>22,23</sup> Based on this, we propose that within a typical collectivist culture like China, college students' interdependent self-construal can strengthen the inhibitory effect of self-esteem on online impulse buying. Interdependent self-construal refers to a self-concept shaped by relationships and social roles, where one's identity is defined by group membership and social bonds, emphasizing interconnectedness and adaptability across different social contexts.<sup>24</sup> For example, a college student with a high interdependent self-construal may place greater value on the expectations and opinions of friends or family, rather than focusing on personal interests or hobbies. Specifically, individuals with an interdependent self-construal tend to focus on group interactions and connections, possess a stronger sense of group belongingness, and enjoy more diverse social support, which facilitates their adaptation to the environment by actively seeking available interpersonal resources and social support.<sup>25-27</sup> Furthermore, individuals with an interdependent self-construal are more likely to adopt a regulatory focus that is prevention-oriented, making them more sensitive to potential losses and risky information, thereby promoting more cautious and less risky consumption choices.<sup>28</sup> Therefore, the study posits that interdependent self-construal is an important condition strengthen the inhibitory effect of self-esteem on online impulse buying.

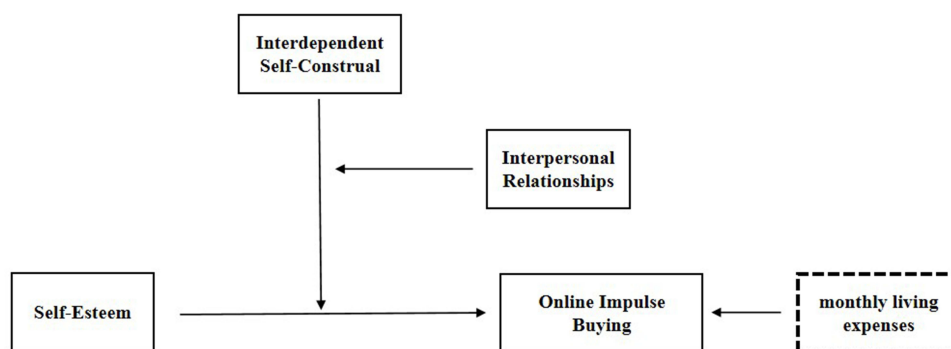
Since high-quality interpersonal relationships are considered a solid social foundation for the development of interdependent self-construal,<sup>29,30</sup> high-quality interpersonal relationships provide the external conditions necessary for individuals with interdependent self-construal to express their true selves.<sup>31,32</sup> Therefore, this study posits that the moderating effect of interdependent self-construal on the relationship between self-esteem and online impulse buying is contingent on the quality of an individual's interpersonal relationships. Specifically, the development of harmonious interpersonal relationships is emphasized by individuals who value social dependency, as it contributes to the formation of self-concept and the attainment of self-worth.<sup>33–35</sup> In contexts characterized by high-quality interpersonal relationships, individuals can form stable and enduring social connections, which not only help those with an interdependent self-construal develop a consistent and stable self-concept but also provide the external conditions for authentic self-expression. This, in turn, enables individuals to make decisions based on their genuine needs and values. Based on this notion, the study suggests that interpersonal relationships serve as an important external condition influences the moderating effect of interdependent self-construal on the relationship between self-esteem and online impulse buying.

Grounded in compensatory consumption theory, our study constructs a three-way interaction model of self-esteem's impact on college students' online impulse buying (Figure 1). The theoretical and practical implications of this study are as follows: First, this study expands the research on the antecedents of online impulse buying by examining the influence of self-esteem on impulse buying. Previous studies have focused on the impact of self-esteem on impulse buying,<sup>7,36</sup> but there has been limited exploration of the relationship between self-esteem and impulse buying in the context of the internet. By investigating the antecedents of irrational behavior among college students in an online environment, this study contributes to our understanding of the drivers of impulse buying in the digital age. Second, our study explores how the quality of college students' interpersonal relationships and interdependent self-construal enhance the inhibitory effect of self-esteem on online impulse buying, deepening our understanding of the moderating role of interpersonal factors that effectively regulate online impulse buying among college students. Based on the context of collectivist cultural values, our study proposes that interdependent self-construal, as an interpersonal-related social cognition, serves as a boundary condition that strengthens the impact of self-esteem on online impulse buying, providing a valuable supplement to the existing literature. Furthermore, we posit that the quality of interpersonal relationships is an objective factor that enhances the moderating role of interdependent self-construal, revealing the comprehensive moderating mechanism of when self-esteem inhibits online impulse buying from both the individual's objective interpersonal environment and subjective cognition. Third, our study provides empirical evidence for the development of effective intervention strategies and the guidance of cultivating rational behavior among college students also.

## Literature Review

### College Students' Self-Esteem and Online Impulse Buying

The compensatory consumption theory posits that when fundamental psychological needs are unmet, individuals are inclined to seek compensation or self-affirmation through consumption behaviors to satisfy their needs for interpersonal belonging and self-worth.<sup>37,38</sup> For example, individuals who live alone may prefer to buy pets to obtain companionship,



**Figure 1** Theoretical model.

**Note:** Dashed lines indicating control variable.

providing themselves with emotional comfort and support.<sup>39</sup> In a similar way, when self-worth is not recognized, people tend to seek self-affirmation through consumption.<sup>40</sup> Self-esteem, as a basic psychological need, is a representation of individual's sense of self-worth.<sup>41</sup> Individuals with low levels of self-esteem, due to unmet intrinsic needs, are more prone to engage in online buying as a form of compensatory.<sup>42</sup> College students are in a critical phase of developing self-identity and constructing value systems, with a strong need for self-evaluation and social identity. However, in campus social circles or internship environments, they may experience rejection or neglect from others, such as in situations of romantic breakups or being excluded by peers.<sup>43</sup> These situations not only diminish an individual's level of self-esteem but also reduce college students' control over their impulsive behavior,<sup>44</sup> leading them to purchase products that symbolize group identity.<sup>45</sup> Prior research found that purchasing symbolic products can provide value compensation, prompting consumers to buy products that symbolize group identity to obtain self-affirmation and value compensation.<sup>46</sup> Online buying has become a primary mode of consumption for college students.<sup>47</sup> When college students' self-esteem is threatened or diminished, online buying serves as a means for them to compensate for their reduced self-esteem.<sup>48,49</sup>

Online impulse buying refers to a sudden, unplanned purchasing behavior that occurs when consumers browse products on the internet, influenced by various factors.<sup>50</sup> This behavior is typically triggered by internal psychological factors or external environmental factors.<sup>1</sup> Empirical studies have found that college students with low levels of self-esteem do indeed tend to exhibit a stronger propensity for online impulse buying.<sup>51</sup> This tendency is not only due to the high accessibility of online shopping platforms but is also closely related to college students' desire for self-identity. Individuals lacking self-esteem are more inclined to engage in impulse buying to fulfill their needs and desires and are more easily influenced by internal factors, such as emotional states, leading to impulse buying.<sup>52,53</sup> In contrast, individuals with high self-esteem are generally more confident and optimistic and do not rely on external validation to meet their psychological needs.<sup>54–56</sup> Therefore, we propose hypothesis as follow:

Hypothesis 1: Self-esteem negatively relates to the likelihood of online impulse buying among college students.

## The Moderating Role of Interdependent Self-Construal

Compensatory online impulse buying arises from threats to self-esteem, a sense of control, and a sense of belonging.<sup>57</sup> When faced with the lack of these intrinsic needs, individuals often resort to alternative means, such as impulse buying, to satisfy their psychological needs and to restore or reinforce their self-concept. Influenced by collective values, individuals in Eastern cultures generally possess an interdependent self-construal, which is shaped by collectivist values. These individuals focus more on their connections with others,<sup>29</sup> place high importance on collective opinions, and maintain self-esteem through caring for others and fulfilling social responsibilities.<sup>58,59</sup> The type of self-construal is closely related to an individual's behavioral choices. For instance, Zhang and Shrum demonstrated that consumers' self-construal is more likely to predict their tendency for impulse buying.<sup>60</sup>

When individuals face interpersonal-related frustrations, such as social exclusion, those with a high level of interdependent self-construal tend to focus on information related to social acceptance and the opinions of others.<sup>61–63</sup> These individuals are also more rational,<sup>64</sup> and therefore, they seek help from peers or support from their in-group to maintain the stability of their self-concept, rather than engaging in negative behaviors or excessively focusing on self-enhancement strategies to meet psychological needs. For example, they are less likely to engage in impulse buying of unnecessary products as a way to compensate for self-worth. In contrast, individuals with a low level of interdependent self-construal are more likely to disregard external opinions and tend to compensate for self-worth through self-adaptation or external material means in response to social exclusion.<sup>65,66</sup> Such individuals are more focused on pursuing personal goals,<sup>67</sup> such as whether their abilities are improving or whether their personal goals are being achieved,<sup>68</sup> with purchasing behavior serving as a way to express the self.<sup>69</sup> When making decisions, those with a higher level of interdependent self-construal are more likely to consider personal image and social evaluation, making more ideal choices that reduce their tendency toward impulse buying.<sup>70,71</sup> Research by Zhang and Hawk indicates that when individuals have a low level of interdependent self-construal, self-esteem negatively relates to materialistic values, indicating that individuals with low interdependent self-construal are more likely to use external material possessions to

compensate for deficiencies in self-worth. However, when interdependent self-construal is high, individuals are less likely to use materialism as a means to compensate for reduced self-esteem.<sup>72</sup>

In summary, to maintain or enhance their self-esteem, individuals with low levels of interdependent self-construal are more likely to engage in online impulse buying. In contrast, for those with high levels of interdependent self-construal, their self-esteem is more sufficiently fulfilled, making the desire to express themselves through purchasing less of a priority. Therefore, we propose hypothesis as follow.

**Hypothesis 2:** Interdependent self-construal moderates the relationship between self-esteem and online impulse buying among college students. Specifically, when the level of interdependent self-construal is low, the negative relationship between self-esteem and online impulse buying is stronger, when the level of interdependent self-construal is high, the negative relationship between self-esteem and online impulse buying is weaker.

## The Three-Way Interaction Effect of Interpersonal Relationships

High quality of interpersonal relationships are the cornerstone for the construction and development of an individual's positive self-concept, serving as a crucial external factor in shaping self-concept,<sup>73</sup> and as an important condition for realizing the positive functions of interdependent self-construal. Moreover, high quality of interpersonal relationships not only provide a safe and supportive environment for individuals but also affirm the individual's relational self,<sup>74</sup> allowing those with an interdependent self-construal to express their true selves and enhance positive emotional experiences.<sup>75,76</sup> Consequently, as a self-concept rooted in a collectivist cultural context, the development of interdependent self-construal is influenced by the quality of interpersonal relationships. Prior study demonstrated that the presence of peers increased the motivation for individuals with an interdependent self-construal to inhibit impulse buying tendencies.<sup>60</sup> Similarly, Hsieh found that the presence of family and friends could mitigate the effect of self-construal on impulse buying.<sup>77</sup> Therefore, this study posits that interpersonal relationships act as an enhancing factor, strengthening the inhibitory effect of self-esteem on online impulse buying among individuals with an interdependent self-construal.

Low quality of interpersonal relationships can hinder the establishment of a relationship-oriented self-concept and negatively impact an individual's self-worth judgment within a group,<sup>78,79</sup> thereby failing to meet the belongingness needs of those with an interdependent self-construal.<sup>80</sup> Additionally, the lack of connection with others can weaken an individual's self-regulation abilities,<sup>81,82</sup> which are essential for restraining or controlling irrational behaviors.<sup>83</sup> Consequently, individuals with diminished self-regulation are more prone to making impulsive choices. Previous studies have indicated that when interpersonal relationships are unsatisfactory, individuals with an interdependent self-construal, due to their strong need for harmonious and intimate relationships, often resort to compensatory strategies to fulfill their interpersonal needs.<sup>84,85</sup> Furthermore, low-quality interpersonal relationships can obstruct individuals from receiving support from their existing social connections, increasing the likelihood of irrational consumption.<sup>86</sup> Therefore, under conditions of low interpersonal relationship quality, the inhibitory effect of self-esteem on online impulse buying among individuals with an interdependent self-construal may be weakened or even absent.

Therefore, the regulatory function of interdependent self-construal on individual behavior is contingent on the quality of interpersonal relationships. High levels of interpersonal relationships enable individuals with an interdependent self-construal to express their true selves and make rational choices. Conversely, low levels of interpersonal relationships hinder the establishment of self-concept and reduce the stability of interdependent self-construal, thereby weakening self-regulation abilities. Based on this, the following hypothesis is proposed:

**Hypothesis 3:** The self-esteem–college students' online impulse buying linkage will be jointly moderated by both interpersonal relationship and interdependent self-construal, such that the linkage will be strongest (weakest) when a college student's both interdependent self-construal is high (low).

## Methods

### Participants and Procedures

This study used a random sampling method to collect data from undergraduate students at several universities in two cities in Guangdong Province, China (Guangzhou and Shenzhen). The research team collaborated with the teaching



affairs office of each university to obtain the necessary permissions and support for conducting the study, which included building a sampling frame and employing a random generator to select each student, after which we distributed electronic questionnaires to the students via the universities' internal WeChat Work platforms (<https://work.weixin.qq.com>) and ultimately received 350 completed questionnaires. All participants were provided with information at the start of the survey and indicated their consent by completing the questionnaire. We assured all participants that their data would remain anonymous and confidential. After excluding 27 invalid questionnaires, we obtained 323 valid responses (92.28%). Among the participants, 131 were male, and 192 were female; 62 were freshmen, 87 were sophomores, 98 were juniors, and 76 were seniors. Additionally, 161 participants (49.8%) were majoring in the humanities, 138 (42.7%) were in science and engineering, and 24 (7.4%) were in other disciplines. The average age of the participants was 19.92 years ( $SD = 1.826$ ). The survey was conducted according to the guidelines of the Declaration of Helsinki and was approved by the Department of Public Administration at Guangdong University of Finance (LSM20221015).

## Measures

### Self-Esteem

We employed the Chinese version of the Self-Esteem Scale (SES) to assess self-esteem, which was originally developed by Rosenberg and later revised by Wang et al<sup>87,88</sup>. The scale consists of 10 items and is scored on a 4-point Likert scale. An example item is, "I feel that I have a number of good qualities". Items 3, 5, 8, 9, and 10 are reverse-scored. In this study, the Cronbach's alpha coefficient for this scale was 0.89.

### Interdependent Self-Construal

We employed the Chinese version of the Self-Construal Scale (SCS) to assess interdependent self-construal, which was originally developed by Singelis and later revised by Wang et al<sup>89,90</sup>. We specifically employed the subscale measuring interdependent self-construal, which consists of 12 items scored on a 7-point Likert scale. An example item is, "I am willing to sacrifice my own interests for the benefit of the group". In this study, the Cronbach's alpha coefficient for this scale was 0.88.

### College Students' Interpersonal Relationship

We employed the College Students' Interpersonal Relationship Scale to assess interpersonal relationships, which was developed by Wu and Qian.<sup>91</sup> The scale includes 19 items and is scored on a 5-point Likert scale. An example item is, "Friends share emotional exchanges, help with worries, and share happiness". Items 2, 4, 8, 9, 10, and 15 are reverse-scored. In this study, the Cronbach's alpha coefficient for this scale was 0.82.

### College Students' Online Impulse Buying

We adapted the method for measuring online impulse buying developed by Kacen and Lee,<sup>15</sup> primarily employing a free recall method to assess participants' online impulse buying. First, we provided the definition of online impulse buying to participants and asked them to recall the planned purchases and budgets for items they intended to buy online over the past month. The difference between the budget and the actual expenditure was considered the amount spent on online impulse buying. Previous studies have found this measurement method, which focuses on online purchasing as the shopping mode, to be simple, intuitive, easy for participants to recall, and highly reliable.

### Control Variable

Previous research has indicated that college students' monthly living expenses affect their consumption capacity and decision-making tendencies,<sup>92</sup> such as impulse buying behavior.<sup>93,94</sup> To better control for biases resulting from differences in economic advantages, our study included college students' monthly living expenses as a control variable.

## Results

### Testing for Common Method Bias

Due to the reliance on self-reported data from participants, potential common method bias may affect the study results. We conducted Harman's single-factor test using an unrotated principal component factor analysis of all variables to assess

possible common method bias.<sup>95</sup> The results indicated that there were eight factors with eigenvalues greater than 1, and the first factor explained 19.41% of the variance. This suggests that there is no significant common method bias in our study.<sup>96</sup>

### Convergent Validity and Discriminant Validity Analysis

Convergent validity was evaluated by average variance extracted (AVE) and composite reliability (CR). The AVE scores for our focal variables ranged from 0.510 to 0.630, all greater than the threshold value (0.500).<sup>97,98</sup> Meanwhile, the CR values for every construct ranged from 0.926 to 0.944, surpassing the 0.70 threshold, which indicates convergent validity.<sup>98</sup> In addition, we used the square roots of the AVE scores as an important indicator to measure the discriminant validity of the key variables in this study.<sup>99</sup> If the square roots of the AVE scores for all pairs of constructs were greater than their correlation coefficients, it would indicate that the focal concepts in this study have good discriminant validity. Consequently, the results confirm the discriminant validity of our focal constructs.

### Descriptive Statistics Analysis

Table 1 presents the mean and standard deviations for each variable as well as the correlations between them. The online impulse buying was significantly positively correlated with living expenses ( $r = 0.21, p < 0.01$ ), significantly negatively correlated with self-esteem ( $r = -0.18, p < 0.01$ ) and interpersonal relationships ( $r = -0.13, p < 0.05$ ). Interpersonal relationships were significantly positively correlated with self-esteem ( $r = 0.17, p < 0.01$ ) and interdependent self-construal ( $r = 0.16, p < 0.01$ ).

### Hypothesis Testing

We used hierarchical regression analyses to test the hypotheses. As shown in Table 2, after controlling for monthly living expenses, self-esteem was significantly and negatively related to online impulse buying ( $\beta = -0.16, p < 0.05$ ), Hypothesis 1 was supported. Moreover, the coefficient of determination ( $R^2$ ) of Model 2 was 0.06, indicating that independent variable (self-esteem) explained 6% of the variance in dependent variable (online impulse buying).

Hypothesis 2 posited that college students interdependent self-construal moderate the relationship between self-esteem and online impulse buying. Prior to hypothesis testing, we mean-centered the predictor (self-esteem) and moderator (interdependent self-construal) to minimize potential multicollinearity. As indicated in Model 4 of Table 2, the interaction term between self-esteem and interdependent self-construal had a significant positive effect on online impulse buying ( $\beta = 0.21, p < 0.01$ ). This indicates that interdependent self-construal positively moderates the negative effect of self-esteem on the amount of online impulse buying. Moreover, the coefficient of determination ( $R^2$ ) of Model 4 was 0.16, indicating that, in addition to including the independent variable, the regression equation also included moderator (interdependent self-construal) and the interaction terms between interdependent self-construal and self-esteem explained 16% of the variance in online impulse buying. Table 3 and Figure 2 presents the results of the simple slope analysis for the moderating effect of interdependent self-construal. When interdependent self-construal was at a low level ( $M - SD$ ), the effect of self-esteem on online impulse buying was not significant ( $t = 0.79, p > 0.05$ ). However, when

**Table 1** Descriptive Statistics and Correlation Analysis Results

Variable	M	SD	AVE	CR	1	2	3	4	5
1.Monthly Living Expenses	1541.54	519.87							
2.Impulse Buying Amount	435.47	678.94			0.016				
3.Self-Esteem	26.08	4.65	0.630	0.944	0.214**	-0.182**			
4.Interdependent Self-Construal	15.22	9.05	0.538	0.926	0.076	0.213**	0.037		
5.Interpersonal Relationships	50.63	7.03	0.510	0.932	0.023	0.172**	0.136*	0.155**	

**Note:** \* $p < 0.05$ , \*\* $p < 0.01$ . 1 = Monthly Living Expenses, 2= Impulse Buying Amount, 3= Self-Esteem, 4= Interdependent Self-Construal, 5= Interpersonal Relationships.

**Abbreviations:** AVE, average variance extracted; CR, composite reliability.

**Table 2** Regression Analysis Results

Variable	Impulse Buying				
	M1	M2	M3	M4	M5
Monthly Living Expenses	0.16*	0.17**	0.170**	0.15*	0.15*
Self-Esteem		-0.160*	-0.22**	-0.18**	-0.21**
Interdependent Self-Construal			0.05	0.04	0.02
Interpersonal Relationships			0.23**	0.20**	0.17**
Self-Esteem * Interdependent Self-Construal				0.21**	0.17*
Self-Esteem * Interpersonal Relationships				0.04	0.05
Interdependent Self-Construal * Interpersonal Relationships				0.03	-0.01
Self-Esteem * Interdependent Self-Construal * Interpersonal Relationships					0.17*
$R^2$	0.03	0.06	0.11	0.16	0.18
$\Delta R^2$	0.03	0.03	0.05	0.05	0.02
$F$	6.33*	6.30**	6.70***	5.92***	6.04***

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . Coefficients are standardized.

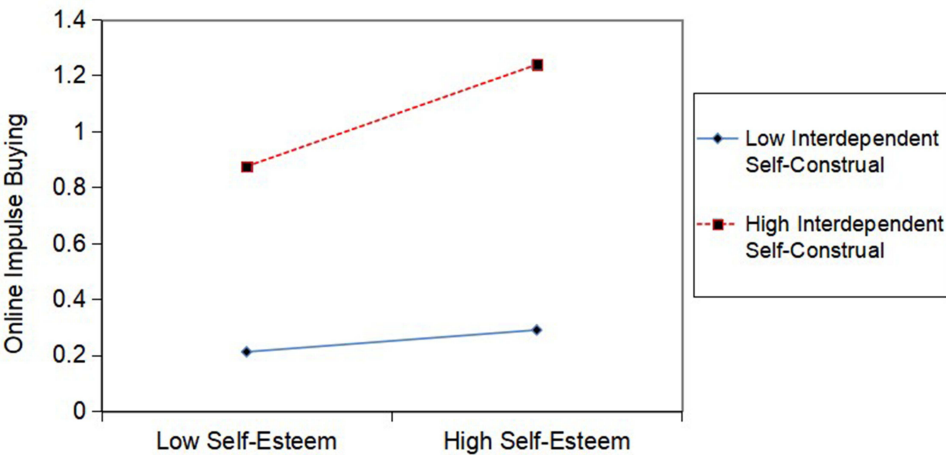
**Table 3** Simple Slope Analysis for the Moderating Effect of Interdependent Self-Construal

Interdependent Self-Construal	Effect	SE	t	P
9.24	-56.19***	12.72	-4.42	0
-9.24	11.50	14.62	0.79	0.431

Notes: \*\*\* $p < 0.001$ . Coefficients are unstandardized coefficients.

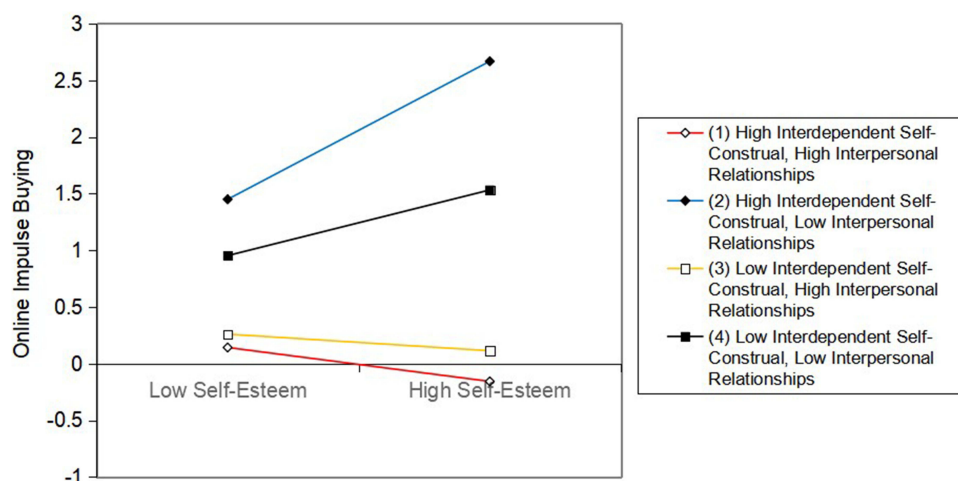
interdependent self-construal was at a high level ( $M + SD$ ), self-esteem had a significant negative effect on online impulse buying ( $t = -4.42$ ,  $p < 0.001$ ), Hypothesis 2 was supported.

Hypothesis 3 posited the joint moderating roles of both interdependent self-construal and interpersonal relationship in linking self-esteem and online impulse buying. We mean-centered the predictor (self-esteem) and moderator (interdependent



**Figure 2** Interaction between interdependent self-construal and self-esteem on online impulse buying.





**Figure 3** Interaction between interpersonal relationships, interdependent self-construal and self-esteem on online impulse buying.

self-construal and interpersonal relationship) to minimize potential multicollinearity before hypothesis testing. Model 5 (Table 2) demonstrates that the three-way interaction term of self-esteem, interdependent self-construal, and interpersonal relationship had a significant positive effect on online impulse buying ( $\beta = 0.17$ ,  $p < 0.05$ ). Moreover, the coefficient of determination ( $R^2$ ) of Model 5 was 0.18, indicating that the inclusion of the three-way interaction terms, along with the independent variable and both moderators, explained 18% of the variance in online impulse buying. The results of the simple slope analysis (Figure 3 and Table 4) indicate that when both interpersonal relationship and interdependent self-construal were at low levels, self-esteem significantly and negatively effect on online impulse buying ( $t = -2.51$ ,  $p < 0.05$ ). When interpersonal relationships were at a low level but interdependent self-construal was at a high level, self-esteem significantly and negatively effect on online impulse buying ( $t = -3.89$ ,  $p < 0.05$ ). When interpersonal relationship and interdependent self-construal were both at a high level, there was an insignificant relationship between self-esteem and online impulse buying ( $t = 1.13$ ,  $ns$ ). Similarly, when interpersonal relationship was at a high level and interdependent self-construal was at a low level, self-esteem was insignificantly associated with online impulse buying ( $t = -1.51$ ,  $ns$ ).

## Discussion

Based on the compensatory consumption theory, this study examines the moderating effect of interdependent self-construal and interpersonal relationship in the relationship between self-esteem and college students' online impulse buying. The results reveal the following: First, self-esteem negatively associates with college students' online impulse buying. Second, interdependent self-construal negatively moderates the relationship between self-esteem and online impulse buying. Specifically, when interdependent self-construal is high, the negative relationship between self-esteem and online impulse buying is stronger than interdependent self-construal is low. Finally, there is a three-way interaction effect among self-esteem, interdependent self-construal, and interpersonal relationship. Specifically, the relationship

**Table 4** Simple Slope Analysis for the Three-Way Interaction Effect

Interpersonal Relationships	Interdependent Self-Construal	Effect	SE	t	P
-7.31	9.24	-73.73***	18.94	-3.89	0.000
	-9.24	-44.49*	17.76	-2.51	0.013
7.31	9.24	20.00	17.77	1.13	0.261
	-9.24	-35.38	23.40	-1.51	0.132

Note: \* $p < 0.05$ , \*\*\* $p < 0.001$ . Coefficients are unstandardized coefficients.

between self-esteem and online impulse buying is strongest when interpersonal relationship is low and self-construal is high, compared to when both interpersonal relationship and interdependent self-construal are at other levels.

This study holds several theoretical implications. First, by examining the influence of self-esteem on online impulse buying, our research extends the body of antecedent studies on online impulse buying. Previous studies have focused on exploring the mechanisms through which self-esteem affects impulse buying,<sup>100,101</sup> but have largely overlooked the exploration of this relationship in the context of the digital age. However, with the widespread adoption and the rapid development of the internet, college students' behavior pattern in online environments exhibits new characteristics and trends. Therefore, investigating the antecedent of online impulse buying under such circumstances has become particularly important. According to the findings of this study, individuals with low self-esteem indeed tend to engage in online impulse buying. Specifically, individuals who lack self-esteem have weaker self-control and may attempt to compensate for their perceived lack of self-worth through material acquisition,<sup>102</sup> leading to impulse buying.<sup>72</sup> Furthermore, in the context of online shopping, consumers are often more willing to take risks, which can result in impulse buying.<sup>103</sup> By revealing the negative impact of self-esteem on online impulse buying, this study enriches the research on the antecedents of online impulse buying. It also deepens the understanding of the mechanisms through which individual psychological traits influence consumer behavior.

Second, this study explores the moderating role of interdependent self-construal in the relationship between self-esteem and the inhibition of online impulse buying. Previous research on impulse buying generally identifies self-regulation as a key factor,<sup>104,105</sup> focusing primarily on the effects of self-control and ego depletion on impulse buying.<sup>106–108</sup> Some scholars have considered self-construal as a boundary condition when investigating the external factors that inhibit impulse buying.<sup>72,109</sup> They have also called for more in-depth research into the relationship between self-esteem and materialistic values, particularly the mechanisms by which self-esteem operates under different levels of self-construal and interpersonal influence. However, few studies have examined the moderating effect of interdependent self-construal. In this study, through empirical analysis, we found that interdependent self-construal moderates the impact of self-esteem on online impulse buying. Specifically, when interdependent self-construal is high, the negative relationship between self-esteem and impulse buying is stronger than when interdependent self-construal is low. This phenomenon might be because individuals with a high level of interdependent self-construal typically place greater importance on their relationships with others and are more influenced by others' expectations and social norms.<sup>110–112</sup> In contrast, individuals with a low level of interdependent self-construal are more likely to act from a personal perspective.<sup>113,114</sup> They seek immediate gratification and pleasure without much consideration of others' influences. Therefore, compared to individuals with low levels of interdependent self-construal, those with high levels of interdependent self-construal value their image and status in social relationships more highly. They are less willing to engage in impulse buying that might damage their image in the eyes of others or lead to negative evaluations for violating social norms. This implies that interdependent self-construal is a significant boundary condition affecting the relationship between self-esteem and online impulse buying, thus providing a meaningful response to previous research.

Third, this study deepens the understanding of the moderating role of interpersonal factors on college students' online impulse buying from an interpersonal perspective. Although Markus and Kitayama have discussed that interpersonal relationships are central to interdependent self-construal, previous research has primarily focused on how interdependent self-construal influences interpersonal relationships.<sup>75,115,116</sup> These research has largely overlooked the reinforcing effect of interpersonal relationships on the functionality of interdependent self-construal. Additionally, this study responds to the call by Zhang and Zhuang,<sup>117</sup> for a more in-depth exploration of consumers' self-concept and peer relationships when studying impulse buying. It reveals how these two factors jointly influence consumers' impulse buying. In this study, we employed a three-way interaction model to demonstrate how interpersonal relationships moderate the effect of interdependent self-construal. Interpersonal relationships act as an enhancing factor that strengthens the inhibitory effect of self-esteem on impulse buying among individuals with interdependent self-construal. Specifically, under conditions of low interpersonal relationships, interdependent self-construal still enhances the inhibitory effect of self-esteem on online impulse buying among college students, particularly among those with a high level of interdependent self-construal. One possible explanation is that in low-interpersonal contexts, individuals might attribute the causes of their behavior to external factors, such as environmental influences or the impact of others. This often leads to failures in self-control, which results in impulse buying.<sup>118</sup> On the other hand, individuals with high levels of interdependent self-construal tend to place greater importance on others' evaluations and social cues, leading to a stronger desire to purchase during consumption. However, our study also found that under high

interpersonal conditions, the influence of self-esteem on online impulse buying among individuals with interdependent self-construal was not significant. This may be because, in high-interpersonal contexts, individuals with interdependent self-construal tend to maintain close relationships with others and are less likely to engage in extravagant behaviors that violate traditional values of frugality.<sup>117,119</sup> In summary, this study provides empirical evidence for understanding the dynamic functions of interdependent self-construal in different interpersonal contexts.

## Limitations and Future Directions

Although this study presents valuable findings and contributes to both theory and practice, there are several limitations that should be addressed in future research. First, the sample in this study is limited to college students in China, which may affect the generalizability of the findings. Future research could broaden the sample to include a more diverse population and conduct cross-cultural studies to validate the applicability of the conclusions across different cultural contexts. Second, this study primarily relies on questionnaire surveys, making it difficult to eliminate errors caused by subjective bias and social desirability effects. Future studies could consider using experimental research designs to enhance the reliability of the findings and achieve more accurate measurements. Third, the cross-sectional design used in this study may weaken the reliability of the conclusions. Future research could adopt a longitudinal design to track changes in self-esteem, interdependent self-construal, interpersonal relationships, and online impulse buying over time. This would allow for the exploration of the dynamic relationships and causal mechanisms among these variables, thereby reducing the impact of common method bias on the reliability of the research conclusions.

## Implications

Our study has important implications for developing effective intervention strategies and guiding cultivating rational behavior patterns among college students. First, for higher education professionals, it is crucial to recognize the ongoing negative consequences of low self-esteem in college students. Such negative self-perception not only impacts their mental health but also leads to online impulse buying, which can have profound adverse effects on their long-term development. Schools can mitigate these effects by offering mental health courses and organizing group activities to help students build a positive self-concept, thereby effectively reducing the negative impact of impulse buying.

Second, this study offers valuable insights for the development of specific intervention measures. The research demonstrates that interdependent self-construal can enhance the inhibitory effect of self-esteem on online impulse buying. For individuals with a high level of interdependent self-construal, it is advisable to guide them towards focusing more on self-independence and reducing their reliance on external evaluations. This can be achieved by encouraging the development of personal interests and hobbies, enhancing autonomy and rationality in group decisions, and fostering an independent self-construal.

Finally, harmonious interpersonal relationships play a crucial role in regulating the behavior of college students. By creating a harmonious campus environment and encouraging positive interpersonal interactions, we can help students form a stable and positive self-concept and social identity, thereby reducing the overall frequency of impulse behavior. Specific measures could include organizing a variety of extracurricular activities, establishing a support network consisting of student counselors, psychological teachers, and peers, and providing students with emotional support and guidance.

## Conclusion

This study proposes a three-way interaction model to explore the influence of self-esteem on college students' online impulse buying, as well as the joint moderating effect of interdependent self-construal and interpersonal relationship. Specifically, college students with high level of self-esteem are less prone to engage in online impulse buying, while a high level of interdependent self-construal can strengthen the inhibitory effect of self-esteem on online impulse buying. Furthermore, when college students with low level of interpersonal relationship and high level of interdependent self-construal, the relationship between self-esteem and online impulse buying is strongest compared to when both interpersonal relationship and interdependent self-construal are at other levels. Our study contributes to a deeper understanding of the relationship between self-esteem and online impulse buying, as well as the moderating role of interdependent self-construal and interpersonal relationship in the context of online and digital environment. This provides new insights for effectively guiding college students in cultivating rational behavior patterns.

## Data Sharing Statement

Data can be made available upon request to the corresponding author.

## Ethics Approval

This study complies with the Declaration of Helsinki. Ethical approval was obtained from the research ethics committee of the Department of Public Administration at GuangDong University of Finance (LSM20221015) before data collection.

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## Author Contributions

Tengfei Guo, Chenzhi Cai, Yanzhen Xu, and Maoyong Huang should be considered co-first authors. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors report no conflicts of interest in this work.

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