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Article

Research on Online Shopping Addiction Based on Flow Theory

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Abstract: From the perspective of consumer experience, this study constructs the influence model of flow experience on online shopping addiction, analyzes and discusses the influencing factors and mechanism of irrational purchasing of domestic consumers in the context of online shopping. Through the empirical test of the model, it is confirmed that in the process of online shopping, creating or improving the sense of immersive presence, enhancing consumers' focus and time distortion can positively affect impulsive buying. The exploratory behavior of consumers promotes their learning and rational thinking, but inhibits their impulse to buy. Impulsive buying fully mediates the relationship between presence, concentration and time distortion, while behavioral repetition moderates the relationship between impulse buying and online shopping addiction. This study confirmed the importance of extreme shopping experience on irrational purchase decision, clarified the mechanism of the influence of each dimension of flow experience on irrational purchase decision, and provided a new idea for the study of consumers' irrational purchase.

Keywords: online shopping addiction; impulsive buying; flow theory

1. Introduction

The outbreak of COVID-19 has given consumers more time to browse and shop online. The e-commerce platform has been upgraded from graphic and text to short video and live e-commerce. Combined with endless marketing methods, the e-commerce platform has created an extremely more immersive shopping experience, which has greatly ignited consumers' buying enthusiasm and impulse to place orders. In 2021, the country's online retail sales reached 13.1 trillion Yuan, up 14.1 percent year on year, 3.2 percentage points faster than the previous year, data showed. Studies have shown that more than 50% of online purchases can be classified as impulsive purchases [1]. Not only impulsive buying is a huge market, but addictive buying also constitutes a large market [2] and is constantly growing [3].

Previous studies believe that addicts are affected by anxiety and stress, low self-esteem, external environmental stimuli and other factors [4] In order to improve self-esteem, reduce tension and escape negative emotions, they choose to engage in addictive consumption [5]. Some scholars have studied the influence of consumer shopping sentiment [6], materialism, hedonism and other perspectives on irrational purchasing behavior. However, in the context of online shopping, irrational purchasing behavior, especially online shopping addiction, is obviously insufficient. The characteristics of shopping addiction are described more, and empirical research on the determinants and formation mechanism of online shopping addiction is obviously insufficient. In view of that the flow experience theory has strong explanatory power and important significance in explaining the

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emotional and cognitive factors that affect online consumer behavior, this paper studies the formation mechanism and influence of online shopping addiction from the perspective of flow experience of consumer experience.

2. Literature review and research hypotheses

2.1. Literature review

2.1.1. Flow theory

Flow experience describes the overall feeling when people are fully engaged in an action. That is, when people are in a state of flow experience, they will enter a common experience mode, completely immersed in their own activities. Psychological states such as narrowing of the focus of self-awareness, loss of self-awareness, clear goal, clear feedback, and sense of control over the environment are displayed [7]. As an important theory of positive psychology, it has been widely used in education, information system, marketing and other fields since it was put forward. In 1996, Hoffman & Novak applied the flow theory to the field of marketing, believing that the flow experience of consumers is generated in the process of purchasing goods, determined by high-level skills and challenges, and focused attention, and enhanced by interaction and presence. Recent studies have also confirmed that flow experiences can evoke positive subjective experiences and attitudes [8] enhance participation, learning, and exploration behaviors [9]. It also has a positive impact on purchase intention and customer loyalty [10–11]. Unlike immersion experience, flow does not occur easily and requires the combined effects of factors such as balance of skill and challenge, perceived fun and interactivity, cognitive experience and emotional experience [12].

2.1.2. Impulsive buying

It is generally believed that irrational buying can be divided into impulsive buying and addictive buying. Impulsive buying was first described simply as unplanned buying behavior [13]. Beatty & Ferrell (1998) expanded the concept of impulsive buying, believing that impulsive buying is a spontaneous behavior without planning and task intention before buying, and is reckless of the consequences [14]. Berlin & Hollander (2014) believe that impulsivity refers to actions without sufficient thinking, or unplanned reactions that tend to be quick and without considering the consequences of actions [15]. Sharma, Sivakumaran, & Marshall (2010) define impulse buying as a sudden, hedonic and complex purchase behavior driven by strong hedonic temptation that can immediately satisfy and improve emotions [16]. And there are few behavioral constraints to resist this temptation [17]. Although different scholars have different definitions of impulsive buying, the basic characteristics of impulsive buying include: unplanned buying behavior, being stimulated by the outside world, made in a very short time, accompanied by strong emotions, and ignoring the consequences.

2.1.3. Addictive buying

Research on shopping addiction stems from compulsive buying and compulsive buying disorder. Some of its symptoms are similar to those of addiction, such as craving, withdrawal, tolerance, withdrawal reaction, conflict and loss of control [18]. Therefore, this paper uses shopping addiction as a substitute for compulsive buying without making too many distinctions. Online shopping addiction is described as an uncontrollable impulse to buy [19], which shows that online shopping addiction is associated with impulsive buying to some extent. Faber & Oguinn (1992) believe that it is a chronic and repeated purchase in response to negative events or feelings [20]. Most of the previous studies attributed compulsive buying to the individual's low arousal level, anxiety, seeking for pressure release, stimulation from external environment, and attempt to extricate from negative emotional states (such as low self-esteem), etc. [4]. On the whole, compulsive purchasing behavior has negative consequences for individuals in the long run. Instead of alleviating emotions, it can aggravate negative emotions (such as depression, frustration, guilt, etc.), and may lead to a high level of debt and many legal and social relationship problems [21].

2.1.4. Flow experiences, impulsive buying, and shopping addiction

The flow experience is the ideal state of being so absorbed in an activity that you forget the passage of time and immerse yourself in it. In this state, it is easy to arouse consumers' positive emotions [22], have better expectations for commodities, and make irrational impulse buying behavior [23].

According to the theory of self-control disorder, self-control ability is a limited resource that will be exhausted [24]. A person's self-control ability will not remain unchanged over time, and it will be worn out in the execution of tasks and may be exhausted, leading to short-vision in decision-making. Impulsive buying represents a certain amount of self-control. When repeated changing behaviors constantly consume this resource, self-control will be completely lost, that is, shopping addiction.

Trait activation theory describes the interaction process of a person's trait, emotional state and situation. Trait expression occurs under the stimulus triggered by situation and affects a person's behavior. Flight et al., (2012) believed that positive emotion is related to impulsive purchase tendency, while negative emotion is related to intrinsic addictive purchase tendency [25]. Impulse buying is driven by positive emotions. If this type of behavior occurs repeatedly, it will show the increase of desire and decline of willpower, and the positive influence of impulse buying will be weakened, which will be gradually replaced by negative emotions and feelings, and eventually uncontrollable buying addiction will develop from impulse buying that loses cognitive control.

According to the above theory, impulsive buying is often driven by positive emotions, and in the process of repeated reinforcement, negative emotions are gradually accumulated and strengthened, and eventually develop into uncontrollable addictive behaviors.

2.2. Research hypothesis

In order to more comprehensively analyze the influence of various dimensions of psychological experience on online shopping addiction, this paper, based on the opinions of Novak, Hoffman &Yung (2000), divides flow experience into four dimensions: presence, concentration, time distortion and exploratory behavior, and studies the influence of each on impulsive buying [26]. The conceptual model is shown in the Figure 1.

Existing studies show that the sense of presence can enhance customers' trust [27], reduce their worries about merchants and commodities [28], and thus stimulate consumers' impulsive buying. The high sense of presence caused by interaction makes consumers consciously immersed in the online shopping scene and generate a pleasant psychological feeling, which is easier to stimulate impulsive buying. The presence stimulation of shopping websites has a positive impact on consumers' emotions and psychological states [29], which can often reduce the complexity of decision-making, shorten decision-making time [30], feel unconstrained, and more likely to trigger irresistible impulse to buy [31]. Accordingly, the following hypotheses are proposed:

H1: Presence has a positive effect on online impulsive buying.

Concentration refers to the focus of individual attention on a limited stimulus domain [7]. Assael (1992) believed that by focusing on shopping websites, more marketing information from merchants could be received and unplanned purchases could be increased [32]. The research of Xu et al. (2020) confirmed that in the live-streaming shopping scenario, consumers are more likely to be stimulated by platform marketing programs and make impulsive and irrational purchase decisions [33]. Hsu et al. (2012) also confirmed that concentration is positively correlated with purchase intention and impulse [34]. Accordingly, the following hypotheses are proposed:

H2: Focus has a positive impact on online impulsive buying.

When consumers actively participate in an activity, they tend to feel that time flies [35], and this distortion of time perception will have a positive attitude towards purchase intention, and then produce a pleasant experience [36]. In other words, consumers who experience high levels of time-warping feelings show more positive emotional responses and are more likely to trigger impulsive purchases. In online shopping environment, there is also a positive correlation between individual positive emotional response and impulse buying [37]. Accordingly, the following hypotheses are proposed:

H3: Time distortion has a positive impact on online impulsive buying.

Exploratory behavior can be divided into exploratory product acquisition and exploratory information search [38]. Exploratory product acquisition is an exploratory behavior to meet the needs of sensory stimulation. It usually has no purchase plan, hedonic browsing without time limit, and has more positive emotions and imagination about things. It is easier to trigger impulse buying under the stimulation of websites [39]. Exploratory information search is an exploratory behavior to meet the needs of cognitive stimulation. It usually pays more attention to product details and word of mouth. The consistency between cognition and word of mouth can positively affect positive emotions [40]. Studies also believe that it is easy to trigger the impulse to buy [33] Exploratory behavior is manifested as more hedonic browsing and easier to make irrational purchase decisions [41]. Accordingly, the following hypotheses are proposed:

H4: Exploratory behavior has a positive impact on online impulsive buying.

Mitchell & Zwaan (2015) described compulsive buying as "irresistible and strong impulse to buy", which means that compulsive buying is an extreme form of impulsive buying, or impulse is an important predictor of compulsive buying [42]. Previous studies have shown that irrational buying can be divided into impulse buying and addictive buying, and the relationship between them can be regarded as a continuum. Impulsive buying is the initial stage, which gradually forms habits and repetitive behaviors and eventually evolves into addicts [43]. Darrat, Darrat, & Amyx (2016) have proved that there is a correlation between impulsive buying and compulsive buying [44]. On the one hand, impulsive buying increases consumers' anxiety, and the accumulation and intensification of anxiety will increase negative emotions, leading to the reduction of cognitive control ability and increasing the probability of shopping addiction. Clinically, impulse buyers and addicts share many of the same symptoms. Accordingly, the following hypotheses are proposed:

H5: Impulsive buying is positively correlated with online shopping addiction.

H6: Impulsive buying plays a mediating role in the presence of online shopping addiction.

H7: Impulsive buying plays a mediating role in concentration on online shopping addiction.

H8: Impulsive buying plays a mediating role in distorting the sense of time and online shopping addiction.

H9: Impulsive buying plays a mediating role between exploratory behavior and online shopping addiction.

Online shopping addiction is seen as a chronic, excessive and repetitive behavior, an uncontrollable obsession or a coping mechanism [45]. According to the theory of addiction, the final formation of addictive behavior is the result of the gradual accumulation of the consumption capital of addictive products. It is through the repeated and alternate selection process that consumers have special preferences for the products, and continuous consumption of addictive products to maintain the utility, which eventually leads to addiction. Players who play games frequently have a higher risk of addiction problems [46]. Behavior repetition is a prerequisite for game addiction [47], and there is a significant correlation between repetitive behavior and online game addiction [48]. Chaloupka (1990) studied cigarette addiction and believed that long-term heavy smoking behavior was the key factor leading to cigarette addiction [49]. Based on this, this paper theorizes that the level of repetition frequency affects the degree of online shopping addiction. That is to say, high-frequency impulsive buying behavior will lead to a deeper degree of online shopping addiction, while low-frequency impulsive buying behavior may only lead to a lower level of online shopping addiction. Accordingly, the following hypotheses are proposed:

H10: Behavior repetition plays a moderating role between impulsive buying and online shopping addiction.

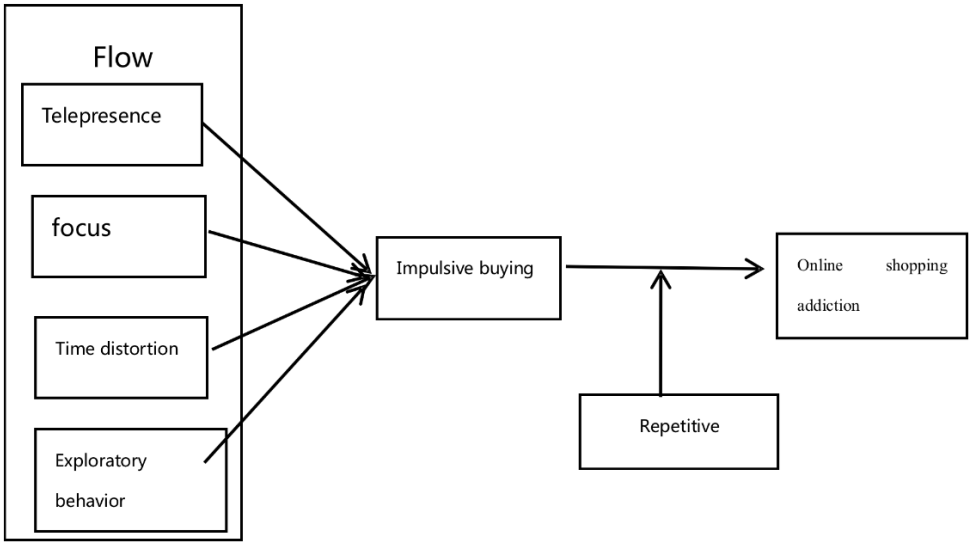

Figure 1. Conceptual model of influencing factors of online shopping addiction.

2.3. Data source and analysis

Based on the flow experience questionnaire of Novak et al. (2000) and the addiction questionnaire of Griffiths et al. (2015) and Chou & Ting (2003) [32, 50], this study distributed 600 questionnaires through the domestic network, not limited to specific groups, and 570 were collected. The recovery rate is 95%. Considering that many data of the consumer survey may not meet the requirements of normal distribution and scale interval, and the sample size may not meet the requirements of maximum likelihood estimation, and the current research theoretical system on online shopping addiction is not mature, Smart PLS software was used for data analysis.

2.3.1. Reliability and validity evaluation

Internal consistency was tested by Composite Reliability and Cronbach's Alpha(α) coefficient. In the exploratory study, Composite Reliability was required to be above 0.7. Cronbach's Alpha(α) coefficient should be greater than 0.6. As can be seen from Table 1, the Composite Reliability and Cronbach's Alpha(α) coefficient of all latent variables meet the requirements, which indicates that the measurement model has good reliability.

Table 1. Results of internal consistency test.

Vairables	Cronbach's Alpha	Composite reliability（CR）
Telepresence	0.845	0.895
Focus	0.855	0.902
A distorted sense of time	0.81	0.887
Exploratory behavior	0.795	0.88
Impulsive buying	0.876	0.924
Online shopping addiction	0.926	0.936

Generally speaking, latent variables can be reasonably explained only when Factor loading is greater than 0.5. Convergent validity and discriminant validity of PLS model require Average Variance Extracted (AVE) to be greater than 0.5. And the square root of AVE value is larger than the correlation coefficient of other latent variables. As can be seen from Table 2, the data in this study meet the above conditions, indicating that there is a good linear equivalence relationship between the measured variables and latent variables, and the measurement model has good discriminant validity.

Table 2. Correlation coefficient between AVE square root and latent variable.

	Focus	Telepresence	Impulsive buying	Distorted sense of time	Exploratory behavior	Online shopping addiction
Focus	0.83					
Telepresence	0.67	0.82				
Impulsive buying	0.50	0.42	0.90			
Distorted sense of time	0.59	0.49	0.56	0.85		
Exploratory behavior	0.52	0.52	0.29	0.38	0.84	
Online shopping addiction	0.61	0.58	0.71	0.63	0.43	0.73

Note: The value on the diagonal is the square root of AVE.

2.3.2. Main effect hypothesis test analysis

The test results show (Table 3) that the path coefficients of presence, concentration and distorted time perception on impulsive buying are 0.109, 0.219, 0.405 and 0.008, respectively. The t-test values are all greater than 1.96, and the P values are less than 0.05, which means that hypothesis 1, 2, 3 and 5 are valid. It indicates that presence, concentration and distorted time perception have significant positive effects on impulsive buying. The path coefficient of exploratory behavior on impulsive buying is 0.008, T=0.15<1.96, P>0.05, the confidence interval contains 0, the hypothesis is not valid, indicating that there is no necessary relationship between exploratory behavior and impulsive buying. The test path coefficient of impulsive purchase is 0.709, and both T value and P value meet the significance requirement, indicating that impulsive purchase has a significant positive impact on online shopping addiction.

Table 3. Test results of main effect.

Hypothesized path	Path coefficient	T value	P value	Confidence interval		Results
				5%	95%	
H1: Telepresence → Impulsive buying	0.109	1.87	0.03	0.01	0.20	Supportive
H2: Focus → Impulsive buying	0.219	3.30	0	0.10	0.33	Supportive
H3: Distorted sense of time → Impulsive buying	0.405	8.10	0	0.32	0.49	Supportive
H4: Exploratory behavior → Impulsive buying	0.008	0.15	0.44	-0.09	0.10	Unsupportive
H5: Impulsive buying → Online shopping addiction	0.709	29.81	0	0.67		0.75

2.3.3. Mediating effect hypothesis test analysis

The mediating effect results (see Table 4) show that the indirect effect of presence, distorted sense of time and focus on online shopping addiction through impulsive buying is P<0.01, and the 95% confidence interval does not include 0 value, indicating that the mediating effect of impulsive buying on the relationship between presence, distorted sense of time and focus on online shopping addiction is established. However, the mediating effect of impulsive buying on the relationship between exploratory behavior and online shopping addiction is not established. From the analysis of the total benefit path coefficient, the total effect path coefficient of presence, concentration and distorted time on online shopping addiction is equal to the mediating benefit path coefficient, indicating that impulsive buying plays a full mediating role in the relationship between presence, concentration and distorted time on online shopping addiction.

Table 4. Test results of mediating effect.

Mediation path	Mediation path coefficient	T value	P value	Confidence interval 5%	Confidence interval 95%	Results
H6: Telepresence → Impulsive buying → Online shopping addiction	0.077	1.855	0.032	0.008	0.145	Supportive
H7: Focus → Impulsive buying → Online shopping addiction	0.155	3.252	0.001	0.074	0.232	Supportive
H8: Distorted sense of time → Impulsive buying → Online shopping addiction	0.287	7.499	0	0.224	0.35	Supportive
H9: Exploratory behavior →Impulsive buying → Online shopping addiction	0.006	0.146	0.442	-0.06	0.071	Unsupportive

2.3.4. Test results of moderating effect

The results show (Table 5) that impulsive buying has a significant positive impact on online shopping addiction (path coefficient: 0.705; T = 29.552 > 1.96; P < 0.001); The interaction coefficient between impulsive buying and repetitive behavior is positive, which passes the significance test and is significant at the 0.001 level. The above tests do not contain a value of 0 at 95% confidence intervals. These results indicate that repetitive behavior has a positive moderating effect on the relationship between impulsive buying and online shopping addiction.

Table 5. Test results of moderating effect.

Path	Path coefficient	T value	P value	Confidence interval 5%	Confidence interval 95%	Results
Impulsive buying → Online shopping addiction	0.705	29.552	0	0.666	0.744	Supportive
Repetitive behavior → Online shopping addiction	0.088	2.683	0.004	0.034	0.141	Supportive
Repetitive behavior × Impulsive buying → Online shopping addiction	0.141	4.186	0	0.089	0.199	Supportive

4. Research conclusions and prospects

4.1.Research conclusions

a. The flow experience dimension of presence, concentration and time distortion has a significant positive impact on impulsive buying, indicating that enhancing consumers' immersive presence feeling, concentration and time distortion can improve consumers' impulsive buying. From the perspective of path coefficient, the distorted sense of time has the largest impact on impulsive buying, followed by concentration and presence, indicating that the distorted sense of time has a more immersive flow state than concentration and presence. Exploratory behavior has no significant effect on impulse buying, and the path coefficient is negative, which indicates that exploratory behavior can enhance consumers' ability to learn and actively acquire product information in the process of browsing, and conversely improve consumers' rational thinking, thus inhibiting impulsive buying.

b. Impulse buying has a significant positive effect on online shopping addiction, indicating that impulsive buying is the lead variable of online shopping addiction. The result of impulse buying may be negative emotions such as guilt and self-blame, and the repeated accumulation of such negative emotions can evolve into purchase addiction. Impulsive buying plays a complete mediating role in the relationship between presence, distorted sense of time, and concentration on online shopping addiction, indicating that impulse and impulse buying behaviors generated under flow experience do not directly affect addiction, but need to play an indirect role through impulsive buying.

c. Behavior repetition plays a moderating role between impulsive buying and online shopping addiction. It shows that consumers can reduce the degree of online shopping addiction by reducing the purchase frequency. In order to avoid irrational purchases, you can interrupt the flow state by setting a certain time reminder for Internet browsing. At the same time, after the occurrence of impulsive buying, the regret mechanism can be activated in

time, or by controlling themselves for a period of time not to buy online, to avoid repetitive impulse buying and avoid falling into online shopping addiction.

4.2. The prospect

The existing research on shopping addiction is more in developed countries, but the research on developing and emerging countries is obviously insufficient. In recent years, Chinese Internet shopping has witnessed explosive growth. Impulse buying has become a common phenomenon among consumers. Shopping addiction is showing a spreading trend. Therefore, it is necessary to study irrational online shopping behavior from multiple angles. In the future, it is necessary to conduct further research on online shopping addiction from the following three aspects: first, the emergence and development mechanism of online shopping addiction based on irrationality. The second is to prevent and treat online shopping addiction; The third is to provide institutional guarantee for irrational purchase behavior. The research can help consumers avoid the irrational purchase trap. On the other hand, it can also provide a theoretical basis for government decision-making.

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Conflicts of Interest

The authors declare no conflict of interest.

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