

Research on the influence of VR scenarios in online shopping on consumer impulsive purchase behavior: The perspective of flow experience

Jinhong Feng

School of Management / Shanghai University, China

Abstract : *In 2016, the advent of Alibaba's "Buy+" shopping method brought the application scenario of "Virtual reality(VR)+online shopping" to the world. The interactive 3D shopping environment generated by VR technology can bring consumers an immersive online shopping experience. This innovation in online shopping will attract more attention from consumers and trigger a new round of competition in the e-commerce market. Adopting the method of qualitative research, based on S-O-R theory of environmental psychology, this study constructs a theoretical framework of the influence of VR scenarios on consumers' impulsive purchase in online shopping, and proposes that the main factors affecting consumer impulsive purchase behavior include interactivity, immersion and imagination of VR scenarios. The research conclusion will enrich the research content of impulsive purchase behavior in online shopping, and provide theoretical guidance for enterprise marketing practice and personal impulsive purchase behavior management.*

Keywords : *VR scenarios, Online shopping, Flow experience, Self-control, Impulsive purchase behavior.*

I. INTRODUCTION

With the advent of the mobile Internet era, online shopping has entered people's life as an emerging economic form, which has changed people's shopping habits. Compared with the traditional shopping mode, online shopping can provide consumers with the advantages of less shopping time, more varieties of products and higher cost performance. However, the bottleneck of the development of online shopping is that consumers can not truly feel the quality of products and experience the fun brought by the physical shopping process. In order to break this bottleneck, "VR+ online shopping" has officially entered people's vision. On April 1, 2016, Alibaba launched "Buy+", a new way of shopping, which uses VR technology to generate an interactive 3D shopping environment and bring consumers an immersive online shopping experience. With the rapid development of VR technology in recent years, the popularity of "VR+ online shopping" is just around the corner.

In addition, in the process of consumers' shopping, there is a more common impulse consumption characteristic. Online shopping carnivals such as Taobao's "Double Eleventh" and JD.com's "618" have prompted many consumers to buy a lot of unplanned products due to the temptation of price reduction. After the carnivals, friends will ask each other, "Have you been a big spender this year?". Even in daily life, when consumers inadvertently open online shopping apps, the exquisite merchandise display of online stores will also trigger people's impulsive purchases. With the arrival of experience economy, consumers who are not completely rational are more likely to follow their internal needs and psychological satisfaction and turn from long-term orientation to short-term orientation. Therefore, they are more inclined to make purchasing decisions outside the planned arrangement in a short time, forming impulse purchasing intention. Especially in the online shopping environment with strong interaction and intense sensory stimulation, the impulsive purchase behavior of consumers is more likely to occur.

Based on the realistic background, we cannot help asking these questions: (1) What characteristics of VR scenarios in online shopping affect consumers' purchasing behavior? (2) Will the use of "VR+ online shopping" make consumers more impulsive? What is the mechanism of its action? For the above problems, there are few related literatures at present, which mainly focus on the research of consumers' satisfaction, emotional response, purchase intention and repeated purchase in VR store or VR environment (e.g., Bridges & Florsheim, 2008; Lee & Chung, 2008; Serrano et al., 2013; Lombart et al., 2020). This paper aims to study the

relationship between VR scenario and consumers' impulsive purchase behavior in online shopping, and deeply studies how the flow experience plays a role in this relationship, which based on the S-O-R theory.

The major contribution of this study are as follows. Firstly, most of the literatures are based on traditional e-commerce, such as mobile phones and computer scenes, to study consumers' impulsive purchase behavior. However, "VR+ shopping" is different from the traditional e-commerce, which will have a huge impact on consumers' purchasing behavior. At present, there is a lack of research on VR scenarios in online shopping. According to this new perspective, this paper can expand and supplement the research on impulsive purchase scenarios, which is also the main innovation of our research. Secondly, this paper studies the influence of VR scenarios on consumers' flow experience in online shopping, which enriches the research of flow experience theory. Thirdly, this paper provides theoretical guidance for enterprise marketing practice and personal impulsive purchase behavior management.

II. LITERATURE REVIEWS AND RESEARCH ANALYSIS

1.Theoretical background

1.1 VR scenarios in online shopping

In the early 1980s, Jaron Lanier, founder of VPL company in the United States, first proposed the concept of VR, which is called Virtual Reality. Specifically, VR refers to a new means of human computer interaction, and this process is completed with the help of high technologies such as computers and the latest sensors. In 1993, American scientists Burdea and Philippe briefly described the three most remarkable characteristics of VR technology, namely interactivity, immersion, and imagination. Interactivity refers to the interaction that users can perceive "truly" in virtual scenarios through daily means such as gazing and waving (Yim, 2017). Immersion means that under the impetus of subjectivity, users actively experience hearing, sight, touch, taste, smell, and other feelings through the perception system in the virtual world and invest more perception and emotion. Imagination means that VR can reproduce the real scene for users and can also create an objective nonexistent environment according to the user's conception. Users can imagine unknown things through association and reasoning according to the acquired information and behavior and enrich their own thinking imagination space. Based on the actual application of VR in online shopping, we divide VR scenarios in online shopping into three characteristics: interactivity, immersion, and imagination.

1.2 Impulsive purchase behavior

The earliest research in impulsive purchase can be traced back to 1950 (Dittmar et al., 1996). Stern (1962) proposed that impulsive purchase is an unplanned purchase behavior made under external stimulus. Early related research mainly focused on the influencing factors of impulse purchase. The main influencing factors can be summarized as product factors (e.g., Bellenger et al., 1978; Rook, 1987; Dittmar et al., 1995; Jones et al., 2003) and marketing stimuli (promotional discounts) (e.g., Piron, 1991; Dholakia, 2000; Badgaiyan & Verma, 2015). Later, many scholars found that the differences of consumers' characteristics will also affect their consumption behavior. Therefore, they began to study the influence of consumers' behavior, motivation, cognition, and emotion on impulse purchase behavior (e.g., Rook & Hoch, 1985; Rook & Gardner, 1993; Block et al., 1999; Sengupta & Zhou, 2007). However, the recent research focuses on the impact of environmental factors and the interaction between consumers and environmental factors on consumers' impulse purchase behavior (e.g., Adelaar et al., 2003; Peck & Childers, 2006). This study involves both environmental factors (VR scenarios in online shopping) and consumer factors (flow experience when consumers shop). Furthermore, we define impulse purchase as the unconsidered and unplanned buying behavior of consumers who experience the impulse to buy something because of the stimulation of VR scenarios in online shopping.

1.3 Flow experience

In 1960, psychologist Csikszentmihalyi first proposed the concept of flow experience. In the summary of the dimension of flow experience, Csikszentmihalyi pointed out that there are nine dimensions of flow experience: (i) Clear goals; (ii) Immediate feedback; (iii) Balance between challenge and personal skills; (iv) The fusion of action and consciousness; (v) Pay attention; (vi) An underlying sense of control; (vii) Loss of self-consciousness; (viii) Time distortion; (xi)Self-purposeful experience (Csikszentmihalyi, 1997). In this study,

from the perspective of psychological perception and the VR scenarios in online shopping, combined with previous studies, the flow experience is defined as the positive experience of being completely immersed or devoted to online shopping activities, accompanied by a series of seamless reactions supported by the interaction with network media technology, namely, heartfelt pleasure, loss of self-awareness and distortion of time, etc.

1.4 Self-control

Self-control is an individual's active judgment and control of his own psychology and behavior, which is embodied in self-restraint in thought and behavior. Dennis and Robert (1995) first mentioned self-control in impulsive purchase research. They found that consumers will not make purchasing decisions immediately when they feel strong purchasing intention, but struggle between self-addiction and self-control. Consumers with strong self-control ability are good at restraining impulse and resisting temptation, and control their own behavior rationally, so that the probability of impulse purchase intention is low.

1.5 S-O-R theory

In 1974, Mehrabian and Russel firstly proposed the S-O-R model (stimulus -- organism -- response), which is mainly used to study how the stimulus of environmental factors affects individual behavior and attitude. The S-O-R model mainly includes stimulus variables, organism variables and reaction variables. According to the S-O-R model of psychology, Bitner (1992) also put forward the consumption behavior model in the similar environment of service activities, which explains the psychological factors influencing consumers' consumption behavior and their internal psychological activities. He believes that consumers' cognitive, emotional, and physical responses to external stimuli can affect their actual behavior.

2. Research framework

Based on the S-O-R theory, this study takes the VR scenarios in online shopping (interactivity, immersion, imagination) as stimulus variable, the consumer's flow experience as organism variable, the consumer impulsive purchase behavior as reaction variable, and the self-control as the regulating variable to establish an analysis framework. The research framework of this paper is shown in figure 1.

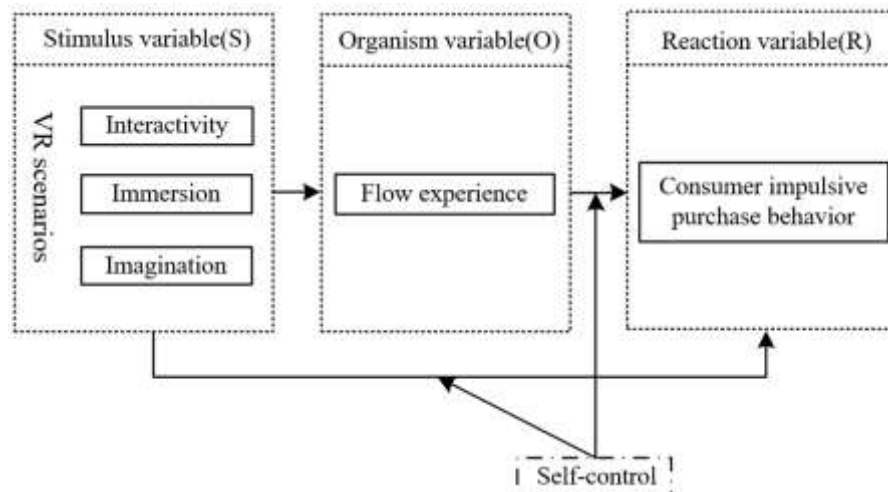


Figure 1: Research Framework

III. ANALYSIS

3.1 VR scenarios in online shopping and impulsive purchase behavior

Online shopping has three characteristics that can easily lead to impulse purchase. Firstly, online shopping has less restrictions on time and space, and consumers can find satisfactory businesses and products whenever and wherever. Secondly, the network platform can satisfy consumers' preferences through technical means and promote their impulsive purchase willingness. Thirdly, attractive words and pictures, frequent

interaction and communication can arouse the excitement of consumers, and easily stimulate consumers to have the impulse to buy (Robert, 2001). Then, VR technology, which is characterized by interactivity, immersion, and imagination, can be used in online shopping to provide consumers with an immersive shopping experience. This new way of online shopping seems to integrate online shopping with physical store shopping, so that consumers can have the vision of physical store to choose and spend without leaving home and crossing time and space. Therefore, the use of VR technology enhances the characteristics that online shopping is easy to trigger impulsive purchases.

VR scenarios characteristics in online shopping can be divided into interactivity, immersion, and imagination. Coyle and Thorson (2001) found that the high vividness and interactivity of commercial websites can effectively awaken consumers' multiple senses, thus generating higher cognition and evaluation of commodities. Immersion is an immersive multi-sensory experience that creates a high level of presence for consumers. When shopping in 3D virtual space, this high level of presence will make them show higher purchase intention (Li & Biocca, 2003). However, the imaginative scene characteristics of VR can enable consumers to get pleasure from the virtual imagination of the changing shopping scene, which will trigger consumers' hedonic shopping motivation and emotional reaction, thus causing impulse purchase intention (Lu & Su, 2009). Therefore, VR scenarios characteristics (interactivity, immersion, and imagination) in online shopping may have a positive impact on consumers' impulse purchase intention.

3.2 VR scenarios in online shopping and flow experience

The flow experience formed by consumers in the process of online shopping is composed of their sense of pleasure, control, and time perception, which is embodied in consumers' comprehensive psychological feelings of enjoying and immersing themselves in online shopping. Network interaction can directly affect consumers' attention, then increase consumers' sense of presence and induce flow experience (Hoffman & Novak, 1996). In the other hand, imagination can make consumers feel happy and induce flow experience. Therefore, VR scenarios characteristics (interactivity, immersion, and imagination) in online shopping may have a positive impact on consumers' flow experience.

3.3 Flow experience and impulsive purchase behavior

Chen et al., (2009) used the variables of "sense of time" and "sense of pleasure in shopping" to describe the state when consumers are in a state of flow. When the flow experience is produced, it means that consumers are focused, completely immersed in it and enjoy themselves. Consumers who are in the flow of mind will lose the concept of time in an environment full of pleasure, and thus make an unplanned purchase intention, that is, impulse purchase. Jiang and Zhao (2013) found that virtual experience in online stores can stimulate consumers' impulsive purchase intention. This is because virtual experience shortens the gap between online products or services and actual ones, reduces the perceived risk of consumers, and leaves them with the pleasure they get from the experience. Then, in order to continue to enjoy this happiness, consumers will continue to buy more products that are not part of the original plan. Therefore, the flow experience may have a positive impact on consumers' impulse purchase intention.

3.4 The mediating effect of flow experience

The interactivity, immersion and imagination of VR scenarios characteristics in online shopping can make consumers completely immersed in the positive experience of online shopping activities and stimulate their flow experience. The pleasure gained in flow experience and the loss of time concept make consumers more likely to have impulse purchase intention. Therefore, flow experience plays a mediating role in the relationship between VR scenarios characteristics and consumers impulsive purchase behavior in online shopping.

3.5 The moderating effect of self-control

Consumer impulsive purchase behavior is the result of interaction between buying consumers' desire and self-control. The flow experience of consumers can stimulate their purchase desire, and the VR scenarios characteristics in online shopping can also trigger the purchase desire of consumers by providing them with the

ultimate shopping experience. When individuals lack self-control ability, there will be more impulsive consumption behaviors. Consumers with high self-control can relatively restrain their purchase desire, thus reducing the probability of their impulsive consumption, and vice versa. Therefore, self-control plays a moderating role in the influence of VR scenarios on consumers impulsive purchase behavior in online shopping.

IV. RESEARCH METHODOLOGY

This paper mainly adopts the qualitative methods of literature research and comprehensive analysis. Literature sources mainly include Web of Science, Google Academic, CNKI and other databases. We reviewed key literatures in the fields of VR scenarios characteristics, consumer impulsive purchase behavior, flow experience, self-control, and S-O-R model, established a research framework, comprehensively analyzed the relationship among various variables, and deeply discussed the possible influence of VR scenarios characteristics on consumer impulsive purchase behavior.

V. CONCLUSION

With the popularity of mobile Internet and online shopping, the growth trend of online shopping users is gradually slowing down. In the current market environment of consumption upgrading, consumers have higher and higher requirements for product quality, product personalization and pay more and more attention to shopping experience. How to improve consumers' online shopping experience has become a major challenge for online retailers. With the emergence of VR technology, all online products are displayed in all directions in 3D, which combines online convenience with offline experience, and better meets consumers' online shopping needs. Various consumption scenarios generated by shopping with VR equipment will also stimulate consumers' willingness to buy and more likely to make impulsive purchases. Therefore, on the basis of the previous studies and combined with the actual situation, this paper determined the three dimensions of VR scenarios in online shopping, that is interactivity, immersion and imagination. And based on the S-O-R theory, we constructed a three-stage research framework. The results of literature review and comprehensive analysis show the result as follows: (i) The three VR scenarios characteristics may have a very positive impact on consumer impulsive purchase behavior; (ii) Flow experience plays a mediating role in the relationship between VR scenarios and consumer impulsive purchase behavior in online shopping; (iii) Self-control plays a moderating role in the relationship between VR scenarios and consumer impulsive purchase behavior.

According to the previous analysis results, this paper puts forward the following suggestions for the traditional e-commerce platform to build VR online shopping platform: (i) E-commerce companies should actively participate in new online shopping methods that use VR devices for online shopping. The development of VR technology is new to many people. The combination of traditional e-commerce and VR technology has not been fully popularized, but with the development of science and technology and the deepening of people's demand for online shopping, this new way of shopping will also bring huge changes to human life and obtain new business opportunities. (ii) Grasp the consumer sentiment dynamic, create multiple sensory marketing incentive in the existing online shopping platform. After consumers log on to the mobile shopping platform, e-commerce companies can set different types of marketing incentives to jointly promote the generation of positive emotions of consumers, which can lead to impulsive purchase and increase sales. At the same time, please avoid causing negative emotions and aversion of consumers.

For consumers, they may regret their impulsive purchase behaviors in a short period of time. Consumers who are troubled by impulsiveness can learn from the results of this study to objectively understand the reasons and incentives for impulsive purchase when using high experiential online shopping devices.

Furthermore, the data support of this paper is insufficient. We hope that with the rapid development of VR technology in the future, we can apply big data to further study the impact of VR scenarios on consumer impulsive purchase behavior.

REFERENCES

- [1] Adelaar, T., Chang, S., Lancendorfer, K. M., Lee, B. M., & Morimoto, M., Effects of media formats on emotions and impulse buying intent, *Journal of Information Technology*, 18(4), 2003, 247-266.

-
- [2] Badgaiyan, A. J., & Verma, A., Does urge to buy impulsively differ from impulsive buying behavior? Assessing the impact of situational factors, *Journal of Retailing and Consumer Services*, 22, 2015, 145-157.
- [3] Bellenger, D. N., Robertson, D. H., & Hirschman, E. C., Impulse buying varies by product, *Journal of Advertising Research*, 18(6), 1978, 15-18.
- [4] Bitner, M. J., Servicescapes: The impact of physical surroundings on customers and employees, *Journal of Marketing*, 56(2), 1992, 57-71.
- [5] Block, L. G., & Morwitz, V. G., Shopping lists as an external memory aid for grocery shopping: Influences on list writing and list fulfillment, *Journal of Consumer Psychology*, 8(4), 1999, 343-375.
- [6] Bridges, E., & Florsheim, R., Hedonic and utilitarian shopping goals: The online experience, *Journal of Business Research*, 61(4), 2008, 309-314.
- [7] Burdea, G., & Coiffet, P., Virtual reality technology, *Presence*, 12(6), 2003, 663-664.
- [8] Chen, J., Cong, F., & Kang, F., Influential factor analysis of consumers' online purchase behavior: A flow experience approach, *Nankai Business Review*, 12(02), 2009, 132-140.
- [9] Coyle, J. R. & Thorson, E., The effects of progressive levels of interactivity and vividness in web marketing sites, *The Journal of Advertising*, 30(3), 2001, 65-78.
- [10] Csikszentmihályi, M., *Beyond Boredom and Anxiety: Experiencing Flow and in Work and Play*, (San Francisco, California: Jossey-Bass, 1975) 21-23.
- [11] Csikszentmihalyi, M., *Flow and The Psychology of Discovery and Invention*, (New York: Harper Perennial, 1997) 16-18.
- [12] Dennis, W. R., & Robert, J. F., Normative influences on impulsive buying behavior, *Journal of Consumer Research*, 22(3), 1995, 305-313.
- [13] Dholakia, U. M., Temptation and resistance: An integrated model of consumption impulse formation and enactment, *Psychology and Marketing*, 17(11), 2000, 955-982.
- [14] Dittmar, H., Beattie, J., & Friese, S., Gender identity and material symbols: Objects and decision considerations in impulse purchases, *Journal of Economic Psychology*, 16(3), 1995, 491-511.
- [15] Dittmar, H., Beattie, J., & Friese, S., Objects, decision considerations and self-image in men's and women's impulse purchases, *Acta Psychologica*, 93(1-3), 1996, 187.
- [16] Hoffman, D. L., & Novak, T. P., Marketing in hypermedia computer-mediated environments: conceptual foundations, *Journal of Marketing*, 60(3), 1996, 50-68.
- [17] Jiang, C., & Zhao, H. X., B2C online store image, consumer perception and purchase behavior, *Research on Financial and Economic Issues*, (10), 2013, 116-122.
- [18] Jones, M. A., Reynolds, K. E., Weun, S., & Beatty, S. E., The product-specific nature of impulse buying tendency, *Journal of Business Research*, 56(7), 2003, 505-511.
- [19] Lee, K. C., & Chung, N., Empirical analysis of consumer reaction to the virtual reality shopping mall, *Computers in Human Behavior*, 24(1), 2008, 88-104.
- [20] Li, H. & Biocca, D. F., The role of virtual experience in consumer learning, *Journal of Consumer Psychology*, 13(4), 2003, 395-407.
- [21] Lombart, C., Millan, E., Normand, J. M., Verhulst, A., Pinlon, B. L., & Moreau, G., Effects of physical, non-immersive virtual, and immersive virtual store environments on consumers' perceptions and purchase behavior, *Computers in Human Behavior*, 2020, 110. Doi:10.1016/j.chb.2020.106374.

- [22] Lu, H. P., & Su, P. Y. J., Factors affecting purchase intention on mobile shopping web Sites, *Internet Research*, 19(4), 2009, 442-458.
- [23] Peck, J., & Childers, T. L., If I touch it I have to have it: Individual and environmental influences on impulse purchasing, *Journal of Business Research*, 59(6), 2006, 765-769.
- [24] Piron, F., Defining impulse purchasing, *Advances in Consumer Research*, 18(1), 1991, 509-514.
- [25] Robert, L. R., On the negative effects of e-commerce: a sociocognitive exploration of unregulated on-line buying, *Journal of Computer Mediated Communication*, (03), 2001, 20-34.
- [26] Rook, D. W., & Gardner, M. P., In the mood: Impulse buying's affective antecedents, *Research in Consumer Behavior*, 6(7), 1993, 1-28.
- [27] Rook, D. W., & Hoch, S. J., Consuming impulses, *Advances in Consumer Research*, 12(3), 1985, 23-27.
- [28] Rook, D. W., The buying impulse, *Journal of Consumer Research*, 14(2), 1987, 189-199.
- [29] Sengupta, J., & Zhou, R., Understanding impulsive eaters' choice behaviors: The motivational influences of regulatory focus, *Journal of Marketing Research*, 44(2), 2007, 297-308.
- [30] Serrano, B., Botella, C., Baños, R. M., & Alcañiz, M., Using virtual reality and mood induction procedures to test products with consumers of ceramic tiles, *Computers in Human Behavior*, 29(3), 2013, 648-653.
- [31] Stern, H., The significance of impulse buying today, *Journal of Marketing*, 26(2), 1962, 59-62.
- [32] Yim, Y. C., Chu, S. C., & Sauer, P. L., Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective, *Journal of Interactive Marketing*, 39, 2017, 89-103.