



Understanding the Psychological Mechanisms of Impulse Buying in Live Streaming: A Shopping Motivations Perspective

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Abstract. Live streaming is an effective tool to increase products sales, which has become a new social commerce. However, few studies have explored the psychological mechanisms of individuals' impulse buying, although live streaming has transformed behaviors of customers. In this study, ground on S-O-R paradigm and motivation theory, we developed a research model to explore how customers develop shopping motivations in live streaming shopping. The results from 318 actual customers in China showed that three situational factors: visibility, parasocial interaction, and social presence of others differently affect form utilitarian and hedonic motivation of consumers. The motivations of both utilitarian and hedonic drive customers' impulse buying decisions. Specifically, utilitarian motivation plays a less significant role in driving customers' purchase intention than hedonic motivation. In conclusion, these findings increase one's comprehension of customers' psychological mechanisms of impulse buying development in live streaming context and spread the range of motivation theory. The findings also supply perceptions to both sellers and platforms in developing strategies.

Keywords: Social commerce · Live streaming · Impulse buying · Parasocial interaction · S-O-R paradigm

1 Introduction

The emergence and development of live streaming have brought substantial transformations for both businesses and consumers' behaviors. The live streaming services are also incorporated into some popular social media platforms such as YouTube to draw more consumers' attention to get involved [1]. Further, some e-commerce websites including Amazon.com/live, Taobao.com provide live streaming services. Within the live streaming shopping, consumers can watch the product more realistically, and thus, live content possesses a high recreational value and stickiness [2]. An increasing number of consumers are immersed in live streaming shopping.

Under the background of big data era, artificial intelligence has gradually penetrated into all walks of life, especially in the field of new media. As an important direction

of simulation technology, virtual reality technology (VR) has been widely used in live streaming in recent years. High-tech VR live streaming enables the audience to enjoy a completely immersive live experience [3], which highlights the situational stimulation of live streaming. Mu Zhang (2019) pointed out that live streaming based on virtual simulation technology is widely used in social and commercial activities. As a theoretical guide of virtual simulation technology, motion-sensing interaction design can effectively improve users' sense of immersion and experience, so the author believed that it will become a new way of live streaming in the future [3]. Mengjuan Fan et al. (2016) proposed that virtual simulation technology provides a brand new display platform and communication channel for sports programs, and better excavates the commercial value of sports programs [4]. Virtual simulation technology can also be applied in the field of medical education, which can help doctors get rid of time and space constraints, learn surgery from the first perspective, and experience the feeling of being in the operating room in person [5]. In live streaming shopping, the application of virtual simulation technology has effectively improved the live streaming technical means, and better guides consumers to conduct live streaming shopping, thereby ultimately increasing the revenue of merchants' live streaming marketing.

Although the live streaming shopping is a new social commerce and has become more and more popular [6], especially in China, most studies focus on gifting behaviors, and only a few studies have inquired into how customers' purchase intention is influenced by live streaming. An understanding of consumers' motivations behind live streaming shopping is important for researchers and sellers. Therefore, this study inquires into the roles of situational factors to develop consumers' motivations. Specifically, we try to explore how to increase value of live streaming measured by visibility, parasocial interaction and social presence of others; then we investigate how the value of live streaming translates into two click motivations (hedonic motivation and utilitarian motivation), and then increase consumers' impulsive buying intentions on live streaming platforms. Our study provides vendors with significant practical enlightenments on how to understand and motivate consumers' shopping behavior in live streaming.

A number of researchers have employed the motivation theory to understand consumers' motivations by using different stimuli to watch their responses [7]. They found that both utilitarian and hedonic motivations have effects on people making behavior to a certain extent like shopping. Hedonic motivation and utilitarian motivation are two critical factors to drive impulse buying behavior [8]. This research extends motivation theory in the live streaming shopping and adopts utilitarian motivation and hedonic motivation as two motivational values to probe into consumers' behavior.

In this study, we use motivation theory and S-O-R paradigm to investigate consumers' impulse buying behavior. Specifically, we would like to answer two questions: (1) Do both utilitarian and hedonic motivations affect impulse buying when watching live streaming shopping? (2) Which factors that drive consumers to form motivations of utilitarian and hedonic respectively?

2 Literature Review

2.1 Live Streaming Shopping

Live streaming initially began as a social media for online video gaming individuals, but has diversified into other areas and has grown into a broader social commerce trend. With the rapid development and progress of science and technology, the form of live streaming has been constantly improved. The live streaming based on virtual simulation technology has gradually become a new development trend of live streaming in the future. Virtual simulation technology is based on computer technology, supplemented by other related science and technology, to generate a digital environment highly similar to the real environment, in which users can have a sense of reality and experience in person [4]. The application of virtual simulation technology has brought technical reform to live streaming, which has greatly improved the marketing effect of live streaming and induced more and more consumers to live streaming shopping. Although the sudden growth in live streaming shopping has driven online sellers and researchers to better understand and adapt to consumer purchase behavior, only a few researches have been reported on consumer purchase behavior.

2.2 Consumers' Motivations

Consumers can get information about products through watching live streaming, which is the first stage of information acquiring and motivations developing. Clicking the product page is the next stage to seek more information. We argue that some values created by live streaming motivate consumers' motivations to click through the product page and assure more about it. Therefore, we used utilitarian click (utilitarian motivation) and hedonic click (hedonic motivation) as motivation cues [9], which influence impulse buying.

2.3 The Stimulus-Organism-Response Paradigm

The S-O-R (stimulus-organism-response) paradigm is a feasible theoretical framework to explain consumers' behavior in online shopping [10]. Stimulus (situational factors) include the shopping environment, the products themselves and the people who shop with you. Organism state refers to an internal status of humans, which is represented by cognitive and emotional status. In this paper, we use utilitarian click and hedonic click, utilitarian and hedonic motivation respectively, as the organism factors, which is supported by some previous studies. Reaction refers to the response to individual's perceptions by some situational factors, such as purchase intention [11]. In this study, we focus on consumers' impulse buying in live streaming, so we just discuss purchase intention.

3 Theoretical Model and Hypotheses Development

In this paper, we began to investigate the drivers and development of consumers' motivations from three dimensions: visibility, parasocial interaction, and social presence of others. We also subdivide the two types of motivations in the model to obtain an in-depth understanding of the role of live streaming value. We present the research model in Fig. 1.

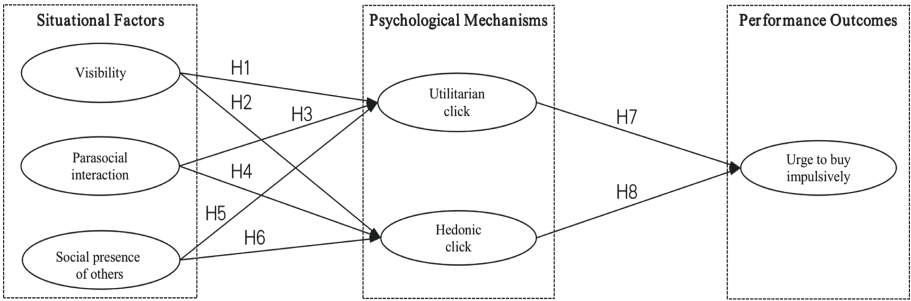


Fig. 1. Research model.

3.1 Visibility and Consumers’ Click Motivation

In e-commerce, consumers are dependent mostly on product images or text descriptions to make purchase decision [12]. Unfortunately, there is a shortage of comprehensive understanding of the product itself which makes consumers hesitant to move to the next step in purchasing the product. In addition, consumers also cannot see the sellers, which also impacts on decision-making ability by the consumer. Visibility, and thus, interaction via online streaming shopping between user audience and online sellers can help decrease the uncertainty. The vividness can attract customers easily [13], which is more likely to stimulate purchasing for consumers than traditional platforms. We hypothesize:

- H1.** Visibility has a positive impact on utilitarian click.
- H2.** Visibility has a positive impact on hedonic click.

3.2 Parasocial Interaction and Consumers’ Click Motivation

Parasocial interaction refers to the relationship between a fan and a famous performer, which is a semblance of intimacy. This is a self-established relationship and others, especially the performer, may be unaware of this relationship and be influenced by them. Such a relationship and its features exist in live streaming platforms.

In live streaming, the interaction between the audience and a streamer can be exposed in a one-to-many or monodirectional mode, especially when attendance is in excess of a certain amount [14]. Therefore, this study tries to show interaction between viewers and streamers by using parasocial interaction. Parasocial interaction may exist on live streaming platforms [14]. If consumers establish an intimate illusory relationship with the streamers, they will be more willing to interact with the streamers and more likely to trust the streamers. Hence, we can hypothesize:

- H3.** Parasocial interaction has a positive impact on utilitarian click.
- H4.** Parasocial interaction has a positive impact on hedonic click.

3.3 Social Presence of Others and Consumers' Click Motivation

The presence of others directly influences user's arousal level [15]. Gefen and Straub (2004) suggest that perceived social presence has a mediating effect on consumers' purchase intention [16]. The presence of others can increase the likelihood of urge to buy impulsively. The presence of others can make online consumers feel more like in a real world. Hence, we suggest that the social presence of others will induce consumers to gain utilitarian or hedonic value through clicking the product page.

H5. Social presence of others has a positive impact on utilitarian click.

H6. Social presence of others has a positive impact on hedonic click.

3.4 Consumers' Click Motivation and Urge to Buy Impulsively

Many researchers adopted the S-O-R paradigm to study impulsive buying because it highlights the role of environmental cues [17]. Previous studies have found that hedonic motivation is a key determinant in the buying behavior [18]. When consumers explore a product page on a live streaming platform, regardless of whether there is any utilitarian or hedonic motivation, they can get more information about the products or services. This not only exposes the consumer to external stimuli, but also creates a positive influence, which are all additives factor forming "urge to buy impulsively" phenomenon [19]. Thus, we propose:

H7. Utilitarian click has a positive impact on the urge to buy impulsively.

H8. Hedonic click has a positive impact on the urge to buy impulsively.

4 Methodology

4.1 Scale Design

Visibility was measured according to Sun et al. (2019) [13]. Parasocial interaction was measured according to Hu et al. (2017) [14]. Social presence of others was measured according to Lu, Fan & Zhou (2016) [20]. Utilitarian click, hedonic click and urge to buy impulsively were measured according to Setyani et al. (2019) [21]. Instruments for all the constructs were adopted seven-point Likert scales, ranges from "1 = strongly disagree" to "7 = strongly agree".

4.2 Data Collection

An online survey was conducted by using sojump.com, which is a well-known survey website adopted in China. In total, 318 effective responses were gathered. We asked the respondents to complete the questionnaire according to their recent experience of watching live streaming shopping.

5 Data Analysis and Results

5.1 Measurement Model

Confirmatory Factor Analysis (CFA) is applied to inspect measurement model. Hair, Black, Babin & Anderson (2010) pointed out that using the indicators such as incremental fit index (IFI), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI), and relative fit index (RFI) to assess goodness-of-fit may change with sample size [22]. It was also suggested that researches use the relatively stable comparative fit index (CFI) and non-normed fit index (NNFI) to assess the model fit. The NNFI in this study was 0.954 and CFI was 0.960, which were both greater than 0.9, indicating that this study had good explanatory power. Chi-square (χ^2) test was also conducted to evaluate the goodness-of-fit. Root mean squared error of approximation (RMSEA) is applied to evaluate the divergence. RMSEA value of below 0.08 represents a good fit. In this study, $\chi^2 = 505.70$, $p < 0.01$, $df = 241$, $\chi^2/df = 2.098$, NNFI (TLI) = 0.954, IFI = 0.960, CFI = 0.960, RMSEA = 0.059, which point that the measurement model fits significantly well.

We also examined measurement model to look further into reliability, convergent validity, and discriminant validity. Dependability was accessed, and the values of all constructs' Cronbach's alpha and composite reliability transcend the recommended threshold 0.7 (see in Table 1). The factor loadings of all items exceed 0.7, showing adequate convergent validity. The item loadings on their allocation factors were greater than their cross-loading on other constructions, which shows well-pleasing discriminant validity. The square root of the AVE of each constructs was greater than its relationship with all other constructions (see in Table 2) showing sufficient discriminant validity.

5.2 Structural Model

The evaluation results of the structural model are shown in Fig. 2. The effects of the visibility on the utilitarian click ($\beta = 0.334$, $p < 0.001$) and on the hedonic click ($\beta = 0.198$, $p < 0.01$) were significant. Hence, H1 and H2 are supported. Parasocial interaction had an active impact on utilitarian click ($\beta = 0.283$, $p < 0.001$) and hedonic click ($\beta = 0.122$, $p < 0.05$). So H3 and H4 are supported. The Social presence of others was importantly associated with utilitarian click ($\beta = 0.296$, $p < 0.001$) and hedonic click ($\beta = 0.378$, $p < 0.001$), thereby supporting H5 and H6. Utilitarian click ($\beta = 0.279$, $p < 0.001$) and hedonic click ($\beta = 0.445$, $p < 0.001$) were discovered to be actively linked with urge to buy impulsively, which supported H7 and H8.

6 Discussion and Implications

6.1 Main Findings and Contributions

The results showed that the research model had powerful psychometric attributes and explicated most of the variances of consumers' urge to buy impulsively in live streaming context. This study have a few interesting findings.

Table 1. Construct reliability and validity.

Construct	Items	Factor loadings	CR	AVE	Cronbach's α	Mean	SD
Visibility(VI)	VI1	0.887	0.890	0.729	0.889	5.092	1.122
	VI2	0.825					
	VI3	0.846					
Parasocial interaction(PSI)	PSI1	0.833	0.891	0.732	0.887	3.940	1.360
	PSI2	0.936					
	PSI3	0.789					
Social presence of others(SPO)	SPO1	0.872	0.829	0.620	0.826	4.582	1.033
	SPO2	0.722					
	SPO3	0.756					
Utilitarian motivation(UM)	UM1	0.924	0.942	0.767	0.938	4.864	1.054
	UM2	0.945					
	UM3	0.905					
	UM4	0.894					
	UM5	0.682					
Hedonic motivation(HM)	HM1	0.809	0.940	0.757	0.939	4.610	1.038
	HM2	0.873					
	HM3	0.920					
	HM4	0.900					
	HM5	0.843					
Urge to buy impulsively(UB)	UB1	0.817	0.939	0.755	0.936	4.347	1.336
	UB2	0.884					
	UB3	0.908					
	UB4	0.926					
	UB5	0.790					

First, in this study, we support that hedonic motivation can promote impulsive buying. This indicates that most customers in live streaming are irrational. As shown in the results, utilitarian click impacts the impulsive buying. It's consistent with previous studies, which found utilitarian motivation can increase consumers' impulsive buying. Hedonic motivation is the pivotal driver of impulsive buying, but its role can be supplemented by utilitarian click.

Second, visibility significantly affects consumers' motivations in both utilitarian and hedonic dimensions. However, it influences utilitarian click more than hedonic click. Therefore, we assume that live streaming can reflect consumers' deeper needs, for example, consumers can get more information to know products like in the real world.

Table 2. Latent variable correlations.

	VI	PSI	SPO	UM	HM	UB
VI	0.854					
PSI	0.487	0.855				
SPO	0.529	0.517	0.787			
UM	0.682	0.720	0.617	0.876		
HM	0.470	0.452	0.508	0.591	0.870	
UB	0.436	0.504	0.557	0.661	0.716	0.869

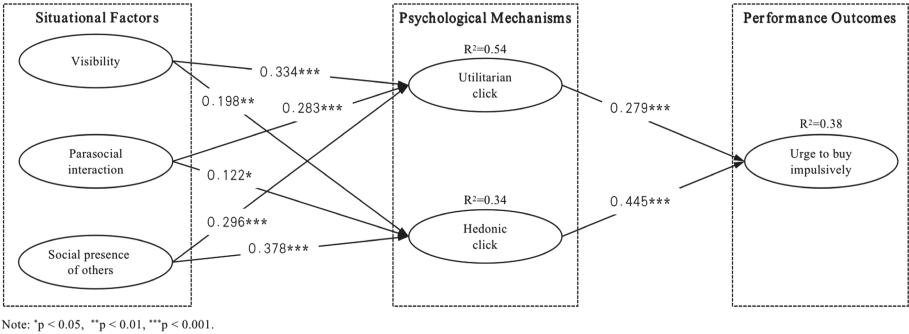


Fig. 2. Structural model results.

Third, the social presence of others significantly affects customers’ motivations in both utilitarian and hedonic dimensions, while its effects on hedonic click is powerful than that on utilitarian click. This is because the social presence of others is mainly related to other consumers’ purchase behavior, interestes and sharings which can be presented on the screen.

6.2 Theoretical Implications

This research investigated impulse buying behavior in live streaming environment from consumers’ psychological mechanism perspective. Based on S-O-R paradigm and motivation theory, we build a model to analyze the effect of motivations on consumers’ impulse buying in live streaming.

First, this paper provides us with an integrated understanding of customers’ impulse decision-making process surrounding live streaming shopping. The model reveals how situational factors influence customers’ motivations, which in turn, promotes customers’ impulse buying decision. The results provides a helpful framework for future studies in live streaming shopping. The results demonstrate that utilitarian click and hedonic click drive customers’ impulse buying decisions.

Second, this research spreads the application range of motivation theory. It is appropriate to use utilitarian click and hedonic click to examine consumers’ motivations in

live streaming context because of its particular characteristics. Therefore, seen in this light, this study developed the motivation theory in live streaming.

Third, this research incorporates three main situational factors in live streaming and gives us an integrated understanding on customers' impulse purchase decision-making process. Few studies examined the influence of live streaming shopping on customers' impulse buying behavior. However, the existence of live streaming helps consumers to make impulsive decisions more easily. The results intensify our understanding of the impact of live shopping.

6.3 Practical Implications

There are some practical implications in this research. First, in order to trigger customers' impulse buying decision, live streaming platforms should concentrate more on characteristics that trigger customers' hedonic, rather than utilitarian. Therefore, live streaming platforms should supply precise and thorough information to enhance users' watching experience.

Second, this study also supplies significances on how streamers stimulate consumers' shopping motivations. Watching live streaming is time-consuming compared to browsing static pictures on e-commerce websites. Therefore, in order to make consumers keep watching live streaming, streamers should reduce consumers' boredom and keep their engaged by entertaining activities (e.g., product demonstration) or incentives (e.g., promotion sale). These measures can bring some positive emotions for consumers and make it easier for them to form hedonic shopping motivation.

6.4 Limitations

This study also has some limitations. First, while the overall model explains the 38% of the variance in impulse buying, other relevant factors are not fully taken into account. Future research should consider a broader range of impulsive buying predictors. Second, this study merely focuses on exploring the influence of situational factors on customers' motivations and impulse buying behavior. Live streaming shopping is toujours a black box. Prospective study can investigate into the live streaming shopping patterns in detail and analyze which streamers' features influence customers' impulse buying behavior. Finally, this study only adopts the questionnaire survey method and the structural equation model for empirical analysis. The research method is relatively single, and future studies can combine the simulation technology to simulate the live streaming situation for more in-depth research.

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