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Do Streamers' Characteristics Influence Impulse Buying in Live Streaming: The Role of Consumers' Perceived Value

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Abstract: Live streaming has opened up a new way to sell products, with streamers playing a leading role. While live e-commerce streaming is becoming more and more common, the question of how to attract viewers and increase conversion rates has become a problem for streamers. Early researchers observed that individual consumer emotions play an important role in increasing impulsivity, which leads to impulse purchases. Streamers have attracted increasing scholarly attention as an important factor influencing consumers' purchase decisions in live streaming, and there is a lack of research on streamers' influence on impulsive purchase behavior . The aim of this study is to explore the factors that influence consumer impulse buying in live streaming and to explore how the characteristics of live streamers influence impulse buying behavior (IBB) through consumers' perceived value (utilitarian and hedonic value). The results show that the streamer's humor and expertise influence consumer perceived value, and that perceived value plays a mediating role in the effect of streamer's humor and expertise on impulse purchase.

Keywords: live streaming, streamer characteristics, impulse buying, perceived value

1. INTRODUCTION

As of December 2020, the scale of China's live streaming users reached 617 million, up 57.03 million from March 2020, accounting for 62.4% of the overall netizen. Since 2013, China has become the world's largest e-tailing market for eight consecutive years, and live streaming has become a popular shopping method for users, with 66.2% of live streaming users having purchased live goods (China Internet Network Information Centre, 2021)[1]. In China, leading e-commerce platforms such as Taobao and Jingdong have embedded live-streaming channels into their platforms.

When presenting a product through live streaming, the streamer in the process of product presentation will enable consumers to get closer to the overall image of the product, including appearance, smell, and quality (Hu and Chaudhry, 2020)[2], live streaming promotes authenticity, visibility, and interactivity in the process of selling a product or service, and the streamer is able to answer consumers' queries in time. This overcomes the disadvantages of traditional online shopping and greatly increases consumers' willingness to buy (Wongkitrungrueng and Assarut, 2020)[3].

Live rooms generally set up visual stimuli, which in turn influence the value perceived by consumers, such as the gong-banging behavior in Austin's live room, but few scholars have studied the impact of value on consumers' impulse buying behavior (IBB), which is an unplanned behavior that is made as a result of certain stimuli (Piron, 1991). With rapid socio-economic development, impulse buying are becoming a higher proportion of our daily purchasing activities and impulse buying is gradually becoming a mainstream phenomenon in China (Lu et al., 2015)[4]. Therefore, it is reasonable to explore the influence of the perceived value of consumers in the live room on their impulse buying behavior (IBB).

Drawing on the stimulus-organism-response (SOR) framework and consumers' perceived value, this study explores the impact of the behavioral characteristics of streamers in live streaming on impulse buying behavior

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through consumers' perceived value (perceived utilitarian value (PUV) and perceived hedonic value (PHV)). To achieve the objectives of this study, the following research questions were asked:

- Are there characteristics of top streamers that can be ordinary streamers replicate?
- Do consumers perceive value when guided by streamers? Which value (PHV and PUV) is perceived?
- Do these PUV and PHV influence consumers' impulse buying behavior (IBB)?

2. THEORETICAL BACKGROUND

2.1 The stimulus-organism-response (SOR) model

Developed by Woodworth (1928), the SOR framework is a common underlying theory in impulse buying and forms the basis of consumer behavior research. Perceived value is generated when consumers are stimulated by various aspects of the live streaming streamer's behavior , which leads to an impulse purchase response. The SOR framework is a model developed for the stimulus response (S-R) approach (Chan et al., 2017) and consists of three components:

- Stimulus: triggers that stimulate consumers (streamers' characteristics);
- Organism: consumers' internal assessments (PUV and PHV);
- Response: consumers' reactions to online impulse purchase drivers and the consequences of their internal assessments (Zhu et al., 2020) (impulse buying behavior (IBB)).

2.2 Streamer characteristics

As live streaming is one of the forms of social media that is primarily designed to give viewers a more intuitive way to learn about product or service information online. Drawing on previous scholarly research, we divide the main characteristics of streamers into two areas: (1) the expertise and trust factor related to streamer competence; (2) the humor factor related to streamer communication style.

2.2.1 Trustworthiness

Gefen (2003) classified consumer trust into personal-based trust, cognitive-based trust, knowledge-based trust and computational-based trust. Person-based trust, also known as the propensity to trust, is the tendency of individuals to believe and trust others, either willingly or unwillingly, and is a personality trait of individuals (Rotter, 1967)[5]. The tendency for personal trust is particularly important in the early stages of relationship development and becomes less important as the number of actual interactions with the other person increases (McKnight, 1998). This trust is based on the belief that the other person is well-meaning and reliable, and comes about in the absence of past experience. In the area of consumer trust research, scholars have noted that the characteristics of the trusted person can have an impact on consumer trust (Doney, 1997).

2.2.2 Expertise

Expertise is demonstrated through an individual's extensive knowledge, skills and abilities in a particular field (Mayer et al., 1995), and is conveyed by the extent to which the streamer knows the product and the information about it during the broadcast, with consumers perceiving the streamer's expertise as he or she explains information about the product or service. When information comes from a source with a high level of expertise, it can have a significant impact on individuals' attitudes, beliefs and behaviors (Ladhari et al., 2020)[6].

2.2.3 Humor

Humor is defined as a characteristic that is funny and comedic, and is one of the effective tools for creating a pleasant atmosphere when communicating with others (Phua and Kim, 2018)[7]. Humor is often used in interpersonal communication and has a positive impact on social interactions, as humour and laughter strengthen interpersonal bonds and allow people to experience emotional release and joy in the process (Hou et al., 2020). Previous research has shown that humorous messages are more persuasive, and humorous advertising has been adopted by most businesses, with scholars suggesting that humorous advertising can enhance consumer attention

and lead to positive evaluations, purchase intentions and other beneficial outcomes (Scott et al., 1990).

2.3 Consumer perceived value

Babin (1994)[8] argues that consumers' subjective experiences influence consumer behavior and classifies perceived value as hedonic value (PHV) and utilitarian value (PUV). Hedonic value views the consumer shopping process as a pleasurable, emotional consumption process that focuses on the consumer emotions triggered by the product or service; utilitarian value is the pursuit of the utility value of the product or service and views the consumer shopping process as a rational, task-oriented endeavour that focuses on the acquisition and actual functional benefit performance of the product or service.

People can derive utilitarian value not only by purchasing the products they are looking for, but also in the process of gathering valuable information for future purchasing decisions. Hedonic value includes characteristics such as pleasure and arousal, consumers can also be motivated by perceived hedonic value, which represents the entertainment, emotional and experiential benefits they perceive during the activity (Babin et al., 1994). Therefore, we believe that consumers can obtain perceived utilitarian value and hedonic value from streamers' performance in live streaming.

2.4 Impulse buying behavior

The vast majority of scholars consider impulse buying behavior to be an unplanned, external stimulus-induced, on-the-spot, immediate decision of purchasing (Piron et al., 1991). Weinberg (1982)[15] suggests that impulse buying is a spontaneous purchase by a consumer who has a strong emotional response to a stimulus in the environment, and thus lacks rational thought.

In summary, impulse buying behavior is, in general, the act of a consumer without a purchase plan, stimulated by an external stimulus to purchase and actually buys the product. Numerous previous studies have shown that in-store ambience, such as lighting, music and smells, can influence consumers' shopping moods and their purchasing behavior , and that well qualified and competent sales staff can help to motivate consumers to make impulse purchases. (Crawford and Melewar, 2003).

3. RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

3.1 Streamer characteristics and consumer perceived value

Scholars have often focused on interpersonal trust and the moral dimensions of trusting relationships, defining trust as "the acceptance that the other person has the opportunity to harm us, but that we are confident that the other person will not do so" (Baier, 1994). Mayer et al. (1995)[10] argue that trust is "the consumer's belief that the trader is trustworthy and therefore willing to suffer harm. This belief includes a belief in the competence, goodwill and integrity of the trusted person". Thus, if consumers have a certain level of trust in the streamer, then consumers will find the message conveyed by the streamer trustworthy and generate utilitarian value.

H1: Streamer's trustworthiness is positively related to perceived utilitarian value (PUV) of consumers

Wu et al. (2018) demonstrated that consumers are able to make decisions through expert advice, and that consumers tend to ask for expert advice and make decisions based on their own realities. The more well-informed the streamer is about various aspects of product information, the more insightful advice he or she can give to consumers, allowing them to successfully select the most suitable product without spending extra effort. In addition, highly skilled product streamers, who are usually knowledgeable in the live streaming, will not only provide one-on-one service, but will also be able to learn new things. As a result, consumers will perceive great utilitarian value in the live streaming with the help of the streamers.

H2a: Streamer's expertise is positively related to perceived utilitarian value (PUV) of consumers

Live streaming is a real-time product display on a media platform. Usually, the streamer will be in front of the screen for physical display or trial, through the display of the product, consumers can clearly see the overall

structure of the product. For example, when the streamer is trying on clothing or make-up trial, the streamer will generally carry out clothing walk or diversified display, consumers can not only see the effect of the product on the body, but also enjoy the fun the streamer brings during the process.

H2b: Streamer's expertise is positively related to perceived hedonic value (PHV) of consumers

Humor is a communication strategy that scholars have noted can bring enjoyment and emotional release (Sternthal and Craig, 1973)[11]. By using humor skills, individuals are able to create a cheerful atmosphere when interacting with others, creating a relaxed and comfortable atmosphere for the person they are communicating with (Phua and Kim, 2018)[12]. Even if the consumer has no intention to buy, but is influenced by the pleasant atmosphere through the streamer, he/she can quickly develop a positive feeling towards the product or service that the streamer is promoting, which leads to a purchase behavior .

H3: Streamer's humor is positively related to perceived hedonic value (PHV) of consumers

3.2 Consumer perceived value and impulse buying

In the live streaming, the streamer usually introduces the product information and shows and tries out the actual product, during which the consumer can clearly feel the overall effect of the product and make their own judgement. This is especially true for technology products, where the streamer will generally provide knowledge and recommend products on demand, which can stimulate consumers to make impulse purchases. Thus, we believe that the utilitarian value that consumers feel in the live streaming can lead to their impulsive purchase decisions.

H4: Consumer's perceived utilitarian value (PUV) is positively correlated with impulse buying behavior

In a hedonic context, previous research has identified a strong link between emotional responses and impulsivity (Cinjarevic et al., 2011). The main stimulant for impulse buying is exposure to contextual stimuli (Setyani et al., 2019)[13],The contextual stimuli created by the live streaming triggers an emotional response in consumers, and positive emotions can increase consumers' motivation to buy, thus facilitating them to make impulse purchases (Boyi et al., 2015). Thus, we hypothesise that the hedonic value that consumers feel under the guidance of the streamer leads to impulse purchases.

H5: Consumer's perceived hedonic value (PHV) is positively correlated with impulse buying behavior
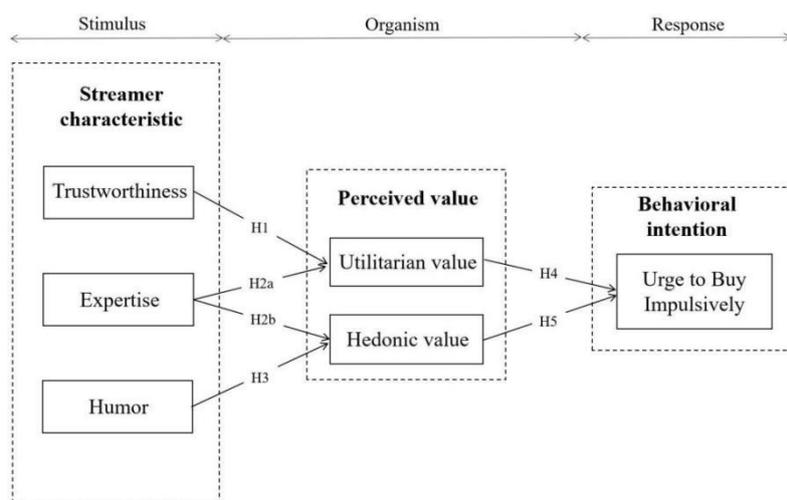

Figure 1.   Research model

4.   RESEARCH DESIGN AND DATA COLLECTION

4.1 Scale design

The questionnaire consists of two main parts, the first of which is the measurement of the variables, with

appropriate adaptations and modifications to the items based on the use of established scales. Specifically, the trust variable was mainly adapted from the scale developed by scholar Ohanian (1990); the expertise items were adapted from Wu et al.'s (2018) scale; and to measure humor, one of its measurement scales was adapted from Zhang et al. (1996) and three from Thorson and Powell's (1993) multidimensional humor scale in the humor Dimensions of Productivity and Creativity. Items measuring utilitarian and hedonic value were adapted from Picot-Coupey et al. (2020), Rintamäki et al. (2006), and Wongkitrungrueng (2018). All items were measured using a five-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree").

The second part of the questionnaire is for the collection of basic personal information, such as gender, income, occupation, etc. As the respondents were mainly from China, we followed the reverse translation method proposed by Bhalla and Lin (1987). The questionnaire was translated into Chinese with some modifications to suit the context of live streaming. In addition, three postgraduate students familiar with research related to live streaming were invited to check the questionnaire and to adjust some items that were not easily understood.

4.2 Data collection

After revising the questionnaire, we created the questionnaire on the Chinese questionnaire website (https://www.wenjuan.com/) and sent it electronically through the questionnaire platform on Weibo, QQ groups and WeChat. We have set some trap questions to ensure the quality of the questionnaire. A total of 262 questionnaires were collected, and 212 valid questionnaires were obtained after removing some invalid ones.

Of the 212 valid questionnaires collected, the majority (61.3%) are female, with a lower percentage (38.7%) being male, but previous research has found that women tend to be more likely to make impulse purchases than men (Silvera et al., 2018), so this is considered reasonable. In terms of age, the majority of the population is concentrated in the 18-25 years old range (70.3%), and there are reports that the post-90s and 00s are the main online shoppers today (thepaper.cn/baijiahao, 2020), so the age structure should also be appropriate. Overall, in this survey, the sample was collected in general agreement with the corresponding literature and data, with descriptive statistics as shown in Table 1.

Table 1.　Demographic statistics

Characteristics	Category	Frequency	Percentage
Gender	Male	82	38.7%
	Female	130	61.3%
Age	Below 18	6	2.8%
	18-25	149	70.3%
	26-35	40	18.9%
	36-50	17	8.0%
Education	Junior college or below	37	17.5%
	Undergraduate degree	113	53.3%
	Postgraduate degree or higher	62	29.2%
Occupation	Student	106	50.0%
	Working	91	42.9%
	Others	15	7.1%
Monthly income	Below 2000 yuan	82	38.7%
	2000-5000 yuan	68	32.1%
	5001-8000 yuan	37	17.5%
	8001-10000 yuan	16	7.5%
	Over 10000 yuan	9	4.2%

5. DATA ANALYSES AND RESULTS

5.1 Measurement models

5.1.1 Preliminary tests

After data collection, a preliminary sample test was conducted using SPSS27 to determine if the sample data could be used for factor analysis. The preliminary sample test yielded a KMO value of 0.941, a Bartlett's chi-square value of 3431.775 and a Cronbach's Aloha coefficient of 0.956, so the sample data could be used for factor analysis.

5.1.2 Reliability tests

Table 2.   Results of reliability and convergent validity analysis

Construct	Item	Factor loading	AVE	Composite Reliability	Cronbach's Alpha
Trust (TRU)	TRU1	0.889	0.736	0.893	0.891
	TRU2	0.804			
	TRU3	0.878			
Expertise (EXP)	EXP1	0.722	0.557	0.834	0.844
	EXP2	0.784			
	EXP3	0.728			
	EXP4	0.750			
Humor (HUM)	HUM1	0.802	0.642	0.878	0.877
	HUM2	0.799			
	HUM3	0.792			
	HUM4	0.812			
Utilitarian value (UV)	UV1	0.755	0.509	0.806	0.800
	UV2	0.700			
	UV3	0.723			
	UV4	0.674			
Hedonic value(HV)	HV1	0.762	0.582	0.848	0.841
	HV2	0.752			
	HV3	0.758			
	HV4	0.780			
Urge to Buy Impulsively (UBI)	UBI1	0.768	0.600	0.857	0.856
	UBI2	0.779			
	UBI3	0.788			
	UBI4	0.763			

The results of the validation factor analysis using AMOS24 are shown in Table 2. In terms of reliability, the Cronbach index is used as the test index and all the α value are found to be higher than 0.7, indicating that the reliability of the questions meet the requirements and the average variance extracted (AVE) of each dimension are also higher than the threshold value of 0.5. In addition, the combined reliability (CR) value are all higher than the threshold value of 0.7, indicating that the internal consistency of the variables in the questionnaire is not a problem.

For discriminant validity, the diagonal line in Table 3 is the square root of AVE, and the square root of AVE for each dimension is greater than the correlation coefficient between the dimensions; therefore, each dimension in this study is sufficiently differentiated from the other dimensions, indicating good discriminant validity.

Table 3.   Results of discriminant validity analysis

	TRU	EXP	HUM	PUV	PHV	UBI
TRU	**0.858**					
EXP	0.516	**0.746**				
HUM	0.526	0.456	**0.801**			
PUV	0.454	0.478	0.432	**0.713**		
PHV	0.447	0.390	0.498	0.404	**0.763**	
UBI	0.471	0.459	0.445	0.448	0.468	**0.775**

Notes: Diagonal elements (in bold) are the square root of AVEs of constructs.

5.2 The structural model

5.2.1 Model fit

In this paper, the structural equation model in AMOS24 software was used to fit the hypothetical model. Model fit: CMIN/DF = 2.493, GFI = 0.810, CFI = 0.901, NFI = 0.847, IFI = 0.902, RMESA = 0.084. The fit indices of the model meet the recommended value (see table4), indicating a good fit (Bentler, 1983).

Table 4.   Over all model adaptation

Index	Recommended value	This research	Evaluation
CMIN/DF	< 3	2.493	good
GFI	> 0.90	0.810	Acceptable
NFI	> 0.90	0.847	Acceptable
IFI	> 0.90	0.902	good
CFI	> 0.90	0.901	good
RMSEA	< 0.08	0.084	Acceptable

5.2.2 Path analyses

For the path analysis the proposed hypotheses were validated using the AMOS.24 software. As shown in Table 5, we present all the validation results. The results show that the expertise of the streamer has a significant effect on consumers' perceived utilitarian value (PUV) ($\beta=0.992$, $p<0.001$) and perceived hedonic value (PHV) ($\beta=0.393$, $p<0.001$), similarly, the humor of the streamer has a significant effect on consumers' perceived hedonic value (PHV) ($\beta=0.629$, $p<0.001$). In addition, both perceived utilitarian value (PUV) ($\beta=0.391$, $p<0.05$) and perceived hedonic value (PHV) ($\beta=0.547$, $p<0.001$) has a significant effect on impulse buying (UBI). While the streamer trust has no significant effect on consumers' perceived utilitarian value(H1), this is explained by the fact that online consumers have become more rational today, focusing more on the product itself and weakening the influence of factors outside the product to determine whether they need to buy it.

Table 5.   Path coefficients and t-value

Hypothesis	Path	Standardized coefficient	T-value	Support
H1	TRU→UV	-0.047	-0.813	No
H2a	EXP→UV	0.992***	8.780	Yes
H2b	EXP→HV	0.393***	3.860	Yes
H3	HUM→HV	0.629***	6.323	Yes
H4	UV→UBI	0.391**	2.777	Yes
H5	HV→UBI	0.547***	4.405	Yes

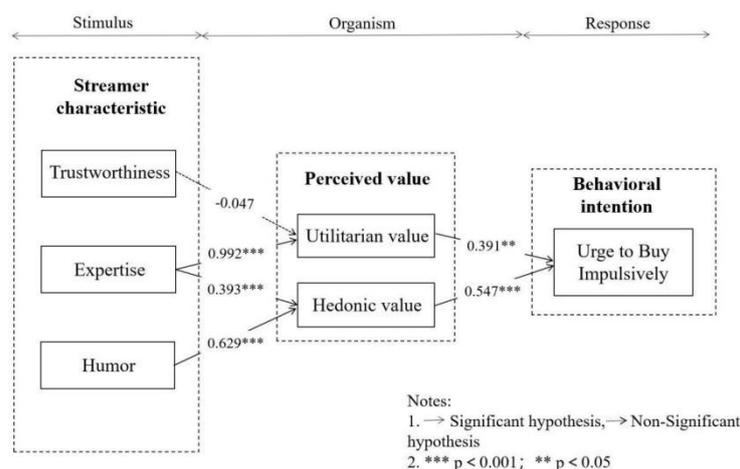Notes: *** $p < 0.001$；** $p<0.05$.

Figure 2. Structural equation model analysis results

5.2.3 Mediation effect tests

Hayes' (2009)[14] Bootstrapping method was used to verify the mediation effect. As shown in Table 6, we used streamer characteristics as the independent variable, consumer impulse buying (UBI) as the dependent variable, and consumer perceived value (PUV and PHV) as the mediator. The results show that consumers' perceived utilitarian value (95% CI: [0.702, 14.449]) and perceived hedonic value (95% CI: [0.38, 0.89]) fully mediate the effect of the streamer's expertise on impulse buying, while perceived hedonic value (95% CI: [0.919, 5.435]) partially mediate the effect of the streamer's humor on impulse buying, suggesting that the streamer's humor not only has a direct effect on consumers' impulse buying behavior, but also mediate through perceived hedonic value.

Table 6. Mediation effect test

| Path | Indirect effect | Direct effect | Bootstrapping Bias-Corrected 95% CI | | Mediation type observed |
			Lower	Upper	
EXP→UV→UBI	1.915	-1.106 ns	0.702	14.449	Full mediation
			-13.544	0.115	
EXP→HV→UBI	0.575	0.241 ns	0.38	0.89	Full mediation
			-0.011	0.505	
HUM→HV→UBI	1.515	-0.801	0.919	5.435	Partial mediation
			-4.319	-0.222	

Notes: ns = non-significant.

6. DISCUSSIONS AND IMPLICATIONS

6.1 Discussion of the findings

In this study, we investigated how the streamer's trustworthiness, expertise and humor enhanced consumers' perceived value and in turn their impulse buying behavior. The findings are discussed below. The results support most of the hypotheses and lead to valuable insights. Firstly, of these characteristics of streamers, expertise is the most important factor as it has a significant impact on both consumers' perceived utilitarian value and perceived hedonic value(H2), with humor also showing a significant impact on consumers' perceived hedonic value(H3). Furthermore, both perceived utilitarian value and perceived hedonic value have a significant impact on impulse buying behavior (H4), with hedonic value having a more significant impact than utilitarian value(H5), confirming

the view that "enjoyment'" is considered to be the main motivation for impulse buying (Baumgartner, 2002)[14].

Finally, we also did a partial pathway mediation test. While for humor characteristics, perceived hedonic value played a partially mediating role, demonstrating that streamers' humor characteristics have a direct impact on consumers' impulse purchases. It is evident that streamers' humor can have a direct impact on consumers' impulse purchases and that emphasis should be placed on the development of streamers' humor traits.

6.2 Theoretical implications

This study enriches the existing literature on live streaming in the e-commerce bandwagon category by providing an examination of the impact of streamer characteristics in the e-commerce live streaming space. It is possible to identify the live streaming platform, the streamer and the consumer as the most important components of live streaming. The existing literature focuses on the characteristics of live streaming (Wongkitrungrueng and Assarut, 2020)[3], the design features of the live streaming platform (Guan et al., 2019), and the usage motivations of streamers and consumers (Cai et al., 2018). However, researchers seem to ignore the influence of streamers. In this study, we divided the perceived value into two dimensions, utilitarian and hedonic, to explore its impact on IBB in terms of the value consumers perceive by the streamer characteristics.

This study lays the groundwork for future research in this area. In addition, previous research on live streaming has focused more on purchase intention (Lee and Watkins, 2016; Park and Lin, 2020) and continuous viewing intention (Chen and Lin, 2018) in live streaming. The main dependent variable in this article is consumer impulse buying behavior , and we investigate the impact of consumer PUV and PHV on IBB, and our results show that PUV and PHV plays a significant mediating role in the influence of streamer characteristics on consumers' impulse behavior, enriching and extending the study of IBB.

6.3 Practical implications

According to the results of our study, the impact of trustworthiness is subtle. In contrast, consumers are more concerned with the humor and expertise of the streamer. Therefore, streamers should focus more on product-related knowledge than on trust. We recommend that streamers go through a systematic process of learning about the products they recommend in order to answer consumers' questions and help them choose more appropriate and higher quality products. In addition, our research demonstrates that streamers' humor has a significant impact on consumers' perceived hedonic value, and streamers should develop a sense of humor to increase their appeal. The important role of utilitarian and hedonic value in influencing consumers' willingness to make impulse buying suggests that products and entertainment remain central to live shopping. Access to specialist product information is a core consumer need.

Therefore, presenting product information and with providing entertainment should be the focus of live content. In addition, streamers should reinforce consumers' perception of hedonic value. By embedding entertainment features into the live content to create an enjoyable live atmosphere, these positive feelings can attract more popularity build-up. As research has demonstrated, positive emotions can increase consumers' motivation to buy, thereby facilitating impulse purchases (Fan and Zhang, 2006). Specifically, streamers should increase the diversity of their live content and enhance the delivery of humor. According to Hirschman (1980), consumers with a propensity for impulse buying are seekers of variety, novelty and surprise, and streamers should constantly vary their broadcasts and diversify their broadcasts.

7. LIMITATION AND FUTURE RESEARCH

This study still has several limitations that can be addressed in future research. Firstly, the sample size of this study is limited, and it is targeted at the vast majority of women and university students, which may be unrepresentative; secondly, there are many other sources of information in live streaming, i.e. Streamer characteristics, such as enthusiasm, appearance and sense of interaction, etc. More variables can be tried from

different scenarios in the future to further discuss the impact of streamer characteristics on consumers' impulsive purchasing behavior ; finally, consumers' memories of previous shopping experiences may become blurred over time and the feelings they recall about the streamer may change, so future research would be better served by using other methods to collect data or employing experimental methods to manipulate variables.

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