

How to Take Advantage of Live Streaming to Enhance Consumers' Impulsive Purchasing Behavior: Evidence from China

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Abstract: This study aims to ascertain the influence of the live streamer's personal charisma, subjective norms, brand awareness, and premium content on impulsive purchasing behavior in live streaming. The study reveals that brand awareness is a crucial factor in live streaming. It is further observed that the mediatorial role of subjective norms on several relationships of the model proposed are significant. Also, results highlight the importance of the live streamer's personal charisma and premium content to understand impulsive buying behavior. Multi group analysis results indicate that there are significant differences in demographic variables (gender, age, educational level, personal disposable income, and duration of watching live streaming) in the path of impulsive purchasing behavior among consumers. This research could help live streamers merchants to understand consumers' impulsive buying behavior because the live streamer's personal charisma, subjective norms, brand awareness, and premium content can influence and navigate consumers.

Keywords: live streaming; subjective norms; impulsive purchasing behavior

1. Introduction

Propelled by the booming expansion of China's digital economy, its scale remains the second largest in the world by the end of 2022, according to the Ministry of Industry and Information Technology. Up to December 2022, it is displayed that the number of Chinese netizens reached 1.067 billion, an increase of 35.49 million compared to December 2021, and the internet penetration rate reached 75.6% by the Statistical Report on the Development of Internet in China. In this regard, the huge number of Chinese netizens has formed China's increasingly developing consumer market and laid a solid user foundation for the further development of the digital economy. As a new form of social commerce, live streaming has surged in popularity since the disruptions caused by the COVID pandemic which has shifted the relationships between retailers and customers, and brought about more opportunities for enterprises to reach broader customers. By comparing small and medium-sized enterprises in China and New Zealand, as concluded by (Lingjun Zhang & Emre Erturk, 2022)^[1], merchants can better utilize live streaming to boost sales.

A common definition of live streaming is that a whole new type of e-commerce, which integrates real-time social interaction in the form of live streams (Cai et al., 2018)^[3]. Consumers can not only view detailed text information and images of products being sold, but also watch real-time videos. There is real-time interaction between consumers and sellers, as well as between consumers and consumers in the process of live streaming. Compared to traditional web-based e-commerce or social e-commerce, live streaming not only allows consumers to advance knowledge the products through the form of live streamers trying it on, trying it on, and wearing it on, but also enhances the social attributes of live streaming and users' shopping experience. Along with the booming speed of live streaming in China, not only are more and more companies investing in this new form of e-commerce to Derive economic profits. And it has sparked a bandwagon of academic research on this phenomenon in the academic community.

Nguyen Huu Khoi et al. (2023) focused on live streaming commerce^[2]. They collected 376 livestreaming commerce viewers as the samples to test the link between real-time interactivity and urge to buy impulsively. Concerning the structural results, inspiration experience and pleasure are bridges connecting real-time interaction and impulse buying, while creative shopping strengthens the connection between real-time interaction and inspiration. Unlike Nguyen Huu Khoi et al. (2023)^[2], This study aims

to investigate how and in what ways live streaming merchants use marketing strategies to drive consumers' impulsive purchasing behavior in the context of live streaming, in order to further enhance their business competence. Nevertheless, little is known about the underlining mechanism of how brand awareness and subjective norms impact impulse buying behavior. This research is expected to make further efforts to gain a deeper understanding of impulse buying behavior in the live streaming scenario.

2. Theoretical background

2.1 Impulsive purchasing behavior

To date, impulsive purchasing behavior, as a shopping behavior opposite to rational purchasing behavior, has been extensively conducted by scholars both domestically and internationally, and has achieved plentiful results. Drawing on the S-O-R paradigm and “Dual-Factor Theory”, (Rambabu Lavuri et al.,2023) in their paper have noted the importance of scarcity with regard to retail impulse shopping during the COVID-19 period^[4]. An effort to come up with variables that scarcity and the COVID-19 pandemic show significant moderation between promotional activities and impulsive buying. The rapid development of the digital economy has made further efforts to expand research on impulse buying. As noted by (Achint Nigam et al.,2023)^[5], they have carried out 24 personal interviews with millennials and 15 interviews with offline/omnichannel retailers to investigate the mechanism of impulsive product marketing by using blockchain technology which aim to seek various antecedents of impulsiveness and permission marketing.

Furthermore, widely adopted in studies regarding impulse buying, in order to compete with online retailers, physical retailers adopt a shelf allocation repositioning scheme, with the aim of maximizing customer impulse buying and creating profits for physical stores. (Gihan S. Edirisinghe et al.,2023)^[6]. Although market reports and extant literature have shed light on the importance of impulse buying behavior, whether for physical stores or retail stores. To the best of our knowledge, hardly any studies have depicted various the relationships between impulse buying behavior and subjective norms, as well as brand awareness in the backdrop of live streaming. Filling these gaps, the purpose of this experimental study is to test the process of consumers' impulsive purchasing behavior and examine their impact on impulse buying behavior employing a theoretical framework in the live streaming environment.

2.2 Concept of subjective norms

Theory of Planned Behavior (TPB) is a model proposed by (Ajzen, 1991) to examine the relationship between attitude, subjective norms, perceptual behavioral control, behavioral intention, and behavior^[7]. The wide application of TPB in different fields to extrapolate human behavior. Among them, subjective norms are one of the most important factors determining behavioral intention, and behavioral intention has a direct impact on the generation of behavior. Subjective norms, also known as conformity psychology, reflect the subjective norms formed by individuals influenced by the attitudes or viewpoints conveyed by others, mainly referring to the perceived external pressure when facing behavioral decisions. The others here mainly refer to individuals who are important to them, such as family members, friends, colleagues, or leaders who are close to them. According to TPB, the greater the enthusiasm of individuals for subjective norms, the stronger their behavioral intentions will be.

With the rapid emerging of e-commerce, domestic and foreign scholars have gradually applied TPB theory to the study of consumer online shopping behavior. Arun Kumar and Mrinalini Pandey (2023) have elucidated the crucial role of subjective norms in green purchase behavior by leveraging the construct EWOM^[9]. Ruobing Zhang and Mengxin Chen (2023) have focused on live e-commerce in China^[10]. They collected 600 samples to test the conceptual model for tackling online shopping intention. With regarding to the structural results, subjective norms had favorable and important effect over the behavioral intention of participating, and there is a significant positive correlation between perceived utility value and subjective norms in live e-commerce shopping. Furthermore, subjective norms is positively correlated with the attitude of using social media, prior research supports this notion (Ike Kusdyah Rachmawati et al., 2020)^[11].

3. Hypotheses development

3.1 *The impact of the live streamer's personal charisma on impulsive purchasing behavior*

Live streamers refer to a new type of group that displays product information and usage experience to the consumers through live streaming platforms in a performative manner, thereby promoting consumer purchasing behavior during the live streaming process. They mostly convey positive, positive, and beautiful attitudes and scenarios towards life to consumers, who possess the characteristics of key opinion leader (Zhao Dawei et al., 2021)^[12]. The interest in key opinion leaders has been drawing research attention because they can influence others' purchasing behavior. Especially, it emphasizes the importance of opinion leadership in the context of an online social networking services (SNS) community user purchasing behavior (Sangmi Chai et al., 2023)^[13]. Specifically, the focus of consumers on purchasing goods has changed, and it is no longer just the information and value of the merchandise itself that can drive consumers' shopping behavior in the live streaming setting. There are also facets such as the live streamer's personal charisma, attractiveness, talent performance, live likes, bullet screen interaction, and popularity. Through interaction on social media, people influence each other's decisions through the influence of key opinion leader, social groups and brand activities at TikTok Shop (Ferby Mutia Edwy et al., 2023)^[14].

Therefore, the live streamers are not only the voice for the products they recommend, but also the opinion leaders of consumers in the process of live streaming. A good live streamer can make viewers feel the charm of the product more intuitively, allowing viewers to experience visual impact and deepen their impression of the product. Sometimes consumers choose live streaming rooms with a certain host because of their favorite for them. The live streamer introduces consumers into the use of the product through step-by-step instructions, allowing them to experience the same usage effect as the live streamer. Through enthusiastic interaction between consumers and the live streamer in the live streaming room, consumers are motivated to try things recommended or used by the live streamer, stimulating their purchasing emotions. Accordingly, as an important part of e-commerce live streaming, the live streamer is predicted to affect consumers' impulsive purchasing behavior. In this way, it may be argued that the greater the personal charm of the live streamer, the more likely it is to lead to impulsive purchasing behavior among consumers. This gives rise to our hypothesis:

H1: In the context of live streaming, the live streamer's personal charisma positively impacts impulsive purchasing behavior.

3.2 *The impact of subjective norms on impulsive purchasing behavior*

Previous studies have explored that the potentially influential factor of subjective norms to purchase intention of green products has been addressed in consumer behavior research. (Ya Li et al., 2021) have noted the importance of exploring subjective norms with regard to purchase of energy-saving products that discovered a positive and significant connection between subjective norms and the consumers' buying intention of energy-efficient home appliances in the case of Bangladesh consumers' inclination to buy energy-efficient home appliances. Furthermore^[15], Alvin Refaldy and Rodhiah Rodhiah (2023) have stated that Halal brands are important to followers of adherents of the Islamic faith through their research on products with Halal certification^[8]. They have researched involving the significant role of subjective norms on purchase intention and found attitude as a partial mediator in the relationship between subjective norms and purchase intention.

Although a considerable amount of research has discussed that subjective norms are regard as the principal factor determining people's intentions against the backdrop of marketing and consumer behavior, including their vaccination intentions during the spread of Covid-19 (Kevin Winter et al., 2021)^[16], social media-use intentions for Vietnamese teachers during working (Huong Thi Thu Tran et al., 2023)^[17], entrepreneurial intentions for Indonesian students (Elissa Dwi Lestari et al., 2023)^[18], and consumers' intentions to purchase safely certified vegetables in the emerging market (Hai Minh Ngo et al., 2023)^[19]. Interestingly, as concluded by (Song-Lin Wong et al., 2018)^[20], subjective norms have no direct and significant effect on consumers' purchase intention to suboptimal foods. In contrast, the relationship between subjective norms and purchase intention has shown inconsistent conclusions in the current research. According to Soumaya M. Kaakour (2023), online purchase intention is positively influenced by subjective norms which denotes that the online purchase intention increases when subjective norms increase^[21].

Consequently, based on the above discussion and the gaps in the latest literature, when consumers

watch live streaming, we predict that some consumers still need to make certain value judgments about their shopping behavior. Subjective norms lead to impulsive purchasing intention or become impulsive purchasing behavior, or the entire shopping activity is immediately interrupted. Therefore, in order to comprehensively understand the intrinsic mechanism of consumers' impulsive purchasing behavior in the context of live streaming, this study had selected subjective norms as a variable to conduct in-depth research on consumers' impulsive purchasing behavior. On this basis, the following hypothesis is proposed:

H2: In the context of live streaming, subjective norms positively impact impulsive purchasing behavior.

H2a: In the context of live streaming, subjective norms mediate the effect of the live streamer's personal charisma on impulsive purchasing behavior.

H2b: In the context of live streaming, subjective norms mediate the effect of brand awareness on impulsive purchasing behavior.

H2c: In the context of live streaming, subjective norms mediate the effect of premium content on impulsive purchasing behavior.

3.3 The impact of brand awareness on impulsive purchasing behavior

Fueled by the current progresses of 5G and live streaming, consumers will face more choices in the recommended products and brands while watching live streaming. As is well known, consumers choose brands they like and are familiar with, especially brand awareness, which is an important factor affecting consumers' offline purchasing decisions. As indicated in (Macdonald and Sharp, 2000) study^[22], granted that consumers intend to buy a certain commodity, the recognition of brand serves as the principal and influential ingredient in making a purchase of the goods. Furthermore, brand awareness will affect consumers' willingness to purchase (Zarlish Shahid et al., 2017)^[23]. This study is of great significance for gaining a deeper understanding of how brand awareness affects consumers' purchasing impulse. Because almost every enterprise of all sizes now harnesses live streaming to communicate and enhance awareness of their brands and products, which prompts them to push up their sales and target large markets that traditional marketing cannot achieve.

Muh. Wahyuddin MH (2022) has demonstrated the impact of impulse buying behavior by focusing on brand image^[24], service quality, and store atmosphere. The data was collected from 75 different respondents and were analyzed with multiple linear regression and test F. Consumer confidence in a brand or product will boost impulse buying behavior at the Indomaret Wawotobi Store. (Belinda et al., 2023) have put the emphases on the impact of brand awareness on buying interest^[25]. They have collected 99 samples to test the conceptual model for addressing the effect of brand awareness as a mediator variable. Positive social media can directly or indirectly improve consumers' interest in purchasing or visiting Hapa Kitchen restaurants through brand awareness as a mediating variable in the light of the results of hypothesis testing (t test). Brand awareness, as a term we are familiar with, consumers' willingness to purchase is more influenced by brand awareness. More consumers are inclined to purchase a certain product or service when they already hear of them (Jenefien Yoel Eddon Lydda et al., 2023)^[26]. Withstanding the literature's interest in the creation of the relationship between brand awareness and buying intentions, less attention has been paid to the effect of brand awareness on impulsive purchasing behavior in the live streaming situation. To rectify the gap in our knowledge of impulsive purchasing behavior in the context of live streaming, the current study would attempt to examine the effect of brand awareness. Therefore, we posit:

H3: In the context of live streaming, brand awareness has a positive influence on impulsive purchasing behavior.

3.4 The impact of premium content on impulsive purchasing behavior

With the rapid development of modern society, we are in an era where attention is scarce. By grabbing the attention of the public, we are also grabbing their money bags. Being able to speak and consumers are willing to listen is a rare advantage in live streaming. Accordingly, the content presented during the process of live streaming becomes particularly important. In other words, the premium content provided under live streaming circumstance is the key to attracting consumers. Drawing from Appel et al., (2020), if the content attracts customers' interest at every step of the purchase process, they are more inclined to hang in their social media account^[27]. The past study (Jaakonmäki et al., 2017) has emphasized the value

of content on commercial websites, as it can enhance how products can be better presented, introduced, and demonstrated on the website^[28].

Consumers gravitate to the live streaming rooms that offer good content to help them understand the product more intuitively, stereoscopically, and comprehensively. As construed by (Bouchra & Hasnaa, 2020)^[29], Good content is the crux to mesmerizing customers to the specific website, retaining their permanent interest, and forming a presence that makes for repeated purchase. Similarly, Juharsah, & Hartini (2022) have focused on the Instagram social media followers from handicraft industry to put forward a research model taking into account the relative factors for addressing the influence of social media marketing on purchasing decisions^[30]. Among the four factors they pondered on, content has played a notable role in purchasing decisions in view of social media considerations. Apart from that, live streaming merchants can create more high-quality content to ascertain that their customers are attracted stay in their live streaming rooms. For products recommended by the live streamers in the live streaming room, consumers may generate impulsive purchasing behavior. As such, the following hypothesis is proposed:

H4: In the context of live streaming, there is a significantly positive effect of premium content on impulsive purchasing behavior.

3.5 Research model

The aim of this research is to examine the causal relationship between live streaming marketing variables consisting of; the live streamer's personal charisma, subjective norms, brand awareness and premium content with impulsive purchasing behavior amid live streaming. One of the principal differences that makes a distinction between our present research model and prior researches is that our model puts forward a mediating relationship between subjective norms and impulsive purchasing behavior amid the live streaming. From the aspect of e-commerce adoption, our model is also designed to empirically investigate the roles of the live streamer's personal charisma, brand awareness, premium content in the live streaming environment. Fig. 1 shows the research model employed in this study on the base of literature review and hypotheses developed.

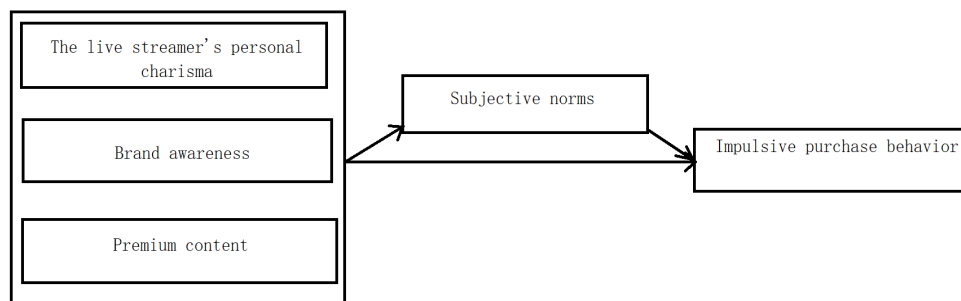


Figure 1: Conceptual research model.

4. Data analysis and results

4.1 Survey administration

To assess the proposed model and hypotheses, data were collected notably relevant to live streaming on social media. This study examined the factors which influence impulsive purchasing behavior between four different variables in the setting of live streaming. A total of 500 email questionnaires and valid website links were distributed during the period of data collection, resulting in a total of 469 valid questionnaires, with a total effective rate of 93.8%. The specific conditions of the survey sample are summarized in Table 1. Regarding gender, 60.34% of respondents identified themselves as female. There is no significant gender difference in the behavior of consumers watching live streaming, and both male and female consumers are the obvious audience. It is also possible to note that 142 respondents were 30 years old or younger. About the level of education, the degree with the highest number of respondents

was Bachelor with about 48.19% of answers, corresponding to 226 responses. The overwhelming majority of the respondents have a fixed income.

Table 1: Descriptive information of participants.

Variables	Items	Frequency	Percentage (%)
Gender	Male	186	39.66%
	Female	283	60.34%
Age	Under 30 years old	162	34.54%
	30-45 years old	226	48.19%
	Over 45 years old	81	17.27%
Education	College degree and below	107	22.81%
	Undergraduate	265	56.5%
	Master's degree	80	17.06%
	PHD degree	17	3.62%
Monthly Disposable Income (USD)	Under \$700	248	52.88%
	\$700- \$1560	171	36.46%
	Over \$1560	50	10.66%
Occupation	Student	103	21.96%
	Institution	108	23.03%
	Government office	78	16.63%
	Enterprise career	102	21.75%
	Professional	64	13.65%
	Other	14	2.99%
Duration of watching live streaming	Less than 15 minutes	183	39.02%
	Over 15 minutes	286	60.98%

4.2 Assessment of measurement model

As given in table 2, there are the results of the adjusted model and the resulting variables. The Cronbach's alpha (α) coefficients of all variables exceeded above 0.700, which range from 0.776 to 0.877. The KMO and composite reliability of all variables are greater than 0.7, which the validity of the adjusted model is reliable.

4.3 Analysis and findings

According to the results of the analysis, the impact of the live streamer's personal charisma, subjective norms, brand awareness and premium content on impulsive purchasing behavior, the results are set as shown in table 3. H1 predicts that the live streamer's personal charisma and impulsive purchasing behavior has a positive effect. In the regression analysis conducted, it is manifested that the live streamer's personal charisma ($\beta=0.407$; $p<0.01$) is positively related to impulsive purchasing behavior, confirming H1. Thereby, the greater the live streamer's personal charisma during the live streaming, the more it will further enhance impulsive purchasing behavior when consumers are watching live streaming.

Hypothesis 2 investigates on the relationship between subjective norms and impulsive purchasing behavior, the result shows that the hypothesis 3 is statistically significant with coefficient values less than 0.30 ($\beta=0.232$; $p<0.01$). As a consequence, consumers will evaluate whether their impulsive buying behavior is appropriate, reasonable, and feasible in the context of live streaming. When consumers believe that their impulsive buying behavior is more reasonable, it is more likely to occur. In other words, impulsive purchasing behavior is more easily influenced by subjective norms. For every unit increase in consumers' subjective norms, impulsive purchasing behavior increases by 0.232 units under the live streaming case.

To test the impact of brand awareness on impulsive purchasing behavior, linear regression analysis is conducted. Based on the regression analysis, the effect of brand awareness ($\beta=0.454$; $p<0.01$) on impulsive purchasing behavior is statistically significant, thereby supporting H3. The result further reveals that a unidirectional relationship between brand awareness and impulsive purchasing behavior. The increasing connection between brand awareness and impulsive purchasing behavior will further improve impulsive purchasing behavior. As expected in the H3, if the brand awareness is too low, it will affect the occurrence of impulsive purchasing behavior among consumers when watching live streaming.

The result of hypothesis 4 establishes premium content to have a significant relationship towards impulsive purchasing behavior ($\beta=0.458$; $p<0.01$), of which the path between premium content and impulsive purchasing behavior is considered to have the higher coefficient among the four hypotheses proposed. Hence, it upholds H4. The result of the current study is essentially consistent with our prediction. The higher the quality of live streaming content and its ability to attract consumers, the greater

the likelihood of impulsive purchasing behavior occurring. When premium content of live streaming is increased by one unit, it will increase impulsive buying behavior by 0.458 units.

Table 2: Results of Reliability and Validity Analysis

Constructs	Composite reliability (CR)	KMO	Cronbach's alpha (a)
LS	0.767	0.945	0.877
BA	0.811	0.951	0.776
PC	0.822	0.955	0.784
SN	0.792	0.947	0.739
IB	0.789	0.911	0.840

Notes: LS=The live streamer's personal charisma; BA= Brand awareness; PC= Premium content; SN=Subjective norms; IB= Impulse buying behavior.

Table 3: Results of Hypotheses Testing

Hypotheses	Path	Coef.	T-values	P	Results
H1	LS- >IB	0.407	3.18	0.002	Supported
H2	SN- >IB	0.232	4.13	0.000	Supported
H3	BA- >IB	0.454	8.20	0.000	Supported
H4	PC- >IB	0.458	11.58	0.000	Supported

Notes: LS=The live streamer's personal charisma; BA= Brand awareness; PC= Premium content; SN=Subjective norms; IB= Impulse buying behavior.

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.4 Analysing the mediating influence of subjective norms

Hypotheses H2a, H2b and H2c tested the mediating effect of subjective norms in proposed relationships of H1, H3 and H4 respectively. Based on the stepwise regression results in Table 4, it can be shown that the regression coefficient of the live streamer's personal charisma on impulsive buying behavior has dropped significantly after adding the regression model, and the regression coefficient of the live streamer's personal charisma has demonstrated a drop from 0.184 units to 0.154 units. Thereby subjective norms mediate the relationship between the live streamer's personal charisma and impulsive buying behavior. Now that the mediating effect stems from the causal relationship between variables, the mediation role of subjective norms can better explain the impact of the live streamer's personal charisma on impulsive buying behavior in the context of live streaming, thus, supporting H2a.

The results of the hypothesis H2b testing of model 1, model 2, and model3 by conducting regression analyses are given in table 4. The regression coefficient of brand awareness on impulsive buying behavior has significantly descended by 0.119 units. Accordingly, subjective norms mediate the relationship between brand awareness and impulsive buying behavior. As a consequence, these analyses reveal that subjective norms have a partial mediator role between brand awareness and impulsive buying behavior. In this sense, the improvement of brand awareness is partially caused by the mediation of subjective norms. Hence, H2b is supported.

H2c posits that subjective norms mediate the influence of premium content on impulsive purchasing behavior. However, subjective norms have no mediator role between premium content and impulsive buying behavior, thus rejecting H2c. We did not find significant relationships between premium content and impulsive buying behavior after adding the mediator of subjective norms.

Table 4: Mediation effect test

Variables	Model 1 IB	Model 2 SN	Model 3 IB	Effect	Proportion
LS	0.184***	0.130***	0.154***	0.03	16.3%
BA	0.573***	0.513***	0.454***	0.119	20.8%
PC		0.149***			
SN			0.232***		
R ²	0.4894	0.5774	0.5075		

Notes: LS=The live streamer's personal charisma; BA= Brand awareness; PC= Premium content; SN=Subjective norms; IB= Impulse buying behavior.

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Results of multi-group analysis

IB	Gender		Age			Education		Income			Duration	
	Male	Female	<30	30-45	≥45	Low	High	Low	Middle	High	<15mins	≥15mins
H1		0.208***	0.188**	0.153**			0.121**	0.169**	0.182***		0.235**	0.171**
H2	0.173**	0.268***	0.251**	0.148*	0.375***	0.572***		0.181**	0.251***	0.333*	0.311**	
H3	0.495***	0.426***	0.430***	0.417***	0.514***	0.204*	0.579***	0.496***	0.417***	0.316*	0.319**	0.548***
H4	0.134**			0.144**								
R ²	0.606	0.447	0.504	0.486	0.497	0.587	0.470	0.456	0.611	0.357	0.569	0.584

Notes: LS=The live streamer's personal charisma; BA= Brand awareness; PC= Premium content; SN=Subjective norms; IB= Impulse buying behavior.

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.5 Multi-group analysis

Although the live stream's personal charisma, subjective norms, brand awareness, and premium content are the main factors affecting impulsive purchasing behavior in the live streaming scenario, there may exist a manifest deviation for the live stream's personal charisma, subjective norms, brand awareness, and premium content among different demographic variables. It is precisely for this reason that we need to utilize multi-group analysis to explore the impact path of consumer impulsive purchasing behavior among different demographic variables. In view of our analysis of previous research and the characteristics of Chinese consumers watching live streaming, this study mainly embodies five demographic variables as follows: gender, age, educational level, personal disposable income and duration of watching live streaming. For this study, 469 valid samples are divided into two groups based on gender, education, and duration of watching live streaming. The results of the multi-group are presented in table 5.

In terms of the positive impact of the live stream's personal charisma on impulsive purchasing behavior (path H1), the influence is significant in the younger group ($\beta=0.188$; $p<0.05$), the middle group ($\beta=0.153$; $p<0.05$), the group with a high level of education ($\beta=0.121$; $p<0.05$), the low-income group ($\beta=0.169$; $p<0.05$), the middle-income group ($\beta=0.182$; $p<0.01$), the group with long duration ($\beta=0.171$; $p<0.05$). While there are not significant in the male group, the older group, the group with a low level of education and the high-income group. The impacts are all significant and relatively high in the female group ($\beta=0.208$; $p<0.01$) and the group with short duration ($\beta=0.235$; $p<0.05$). The reasons for the results presented above may be as below. Female consumers are currently the main force in the live streaming market. As of January 2023, according to QuestMobile data, the number of active female users in the mobile internet group has reached nearly 600 million. In terms of composition, 24.1% are under 24 years old, 31.1% are over 51 years old, and 65.7% are in third, fourth, and fifth tier cities and below; From the perspective of high online consumption willingness and the consumption ability of premium-priced products (over 290 USD), women are still much higher than men. 97% of Chinese women are the main force of purchasing behavior at home. Therefore, female consumers, young consumers, and middle and low-income consumers are more susceptible to the influence of the live stream's personal charisma in their impulsive purchasing behavior. It is precisely because of the attraction of the live stream's personal charisma that consumers have increased their time staying in the live broadcast room to watch the live streaming.

In terms of the positive impact of subjective norms on impulsive purchasing behavior (path H1), the influence is significant in male group ($\beta=0.173$; $p<0.05$), the female group ($\beta=0.286$; $p<0.01$), the younger group ($\beta=0.251$; $p<0.05$), the middle group ($\beta=0.148$; $p<0.1$), the low-income group ($\beta=0.181$; $p<0.05$) and the middle-income group ($\beta=0.251$; $p<0.01$). While there are not significant in the group with a high level of education and the group with long duration. The impacts are all significant and relatively high in the older group ($\beta=0.375$; $p<0.01$), the group with a low level of education ($\beta=0.572$; $p<0.01$), the high-income group ($\beta=0.333$; $p<0.1$) and the group with short duration ($\beta=0.311$; $p<0.05$). In live streaming rooms, whether male or female consumers, regardless of age group and income, subjective norms will affect consumers' impulsive purchasing behavior. This can also explain that subjective norms, as a form of conformity behavior, if people around consumers, including other consumers in the live streaming room and friends around them, convey negative attitudes towards a certain product, it may affect consumers' subjective judgment and most likely make a decision to give up buying. The more educated consumers are, the less influence the people around them in the live broadcast room has on their impulsive purchasing behavior.

The results of the multi-group analysis in Table 5 indicate that the effects are significant in all the groups. The results are sufficient to demonstrate that brand awareness is a noteworthy factor that triggers

impulsive purchasing behavior among consumers in the setting of live streaming. The increase in brand awareness can enhance the recognition and recognition of this specific brand among different consumer groups, and to a large extent, it can encourage consumers to engage in impulsive purchasing behavior amid live streaming.

Although the results in Table 4 show that there is a significant relationship between premium content and impulsive purchasing behavior (path H4), it reveals that only male group ($\beta=0.134$; $p<0.05$) and the middle group ($\beta=0.144$; $p<0.1$) are positively significant, according to the results of the multi-group analysis in Table 5. The reasons for the results presented above may be as below. The results of the multi-group analysis do not indicate that premium content is not a notable consideration affecting consumers' impulsive purchasing behavior in the live streaming circumstance. Different consumer groups have different requirements for live streaming content, just like male and female consumers prefer different live streaming rooms, and young and elderly consumers also prefer different live streaming rooms. It is precisely because the interests and concerns of different consumer groups are different, that different consumer groups have different requirements and preferences for live streaming content.

5. Discussion and implications

Data analysis has found that it is very consistent with our model and has received support.

The live streamer's personal charisma can affect the impulse buying behavior of consumers, and can better promote the impulse buying behavior in the process of live streaming through the mediating effect of subjective norms. The live streamer's personal charisma and professional knowledge and skills in the product enable consumers to have a positive normative evaluation of it and transfer it to the products promoted and recommended by the live streamer. As a result, consumers will believe that the products sold and recommended by the live streamer also have good quality. In view of this, the live streamer's personal charisma should focus on understanding the product, mastering professional knowledge and skills related to the product, and communicating this to the audience to increase their liking. In addition, the live streamer's personal charisma can enhance consumers' normative evaluations and impulsive purchases by enriching their lives, cultivating excellent personal interests and unique personalities. It is precisely because the live streamer's personal charisma has a significant positive impact on consumers' impulsive purchasing behavior that live streaming merchants should try to cultivate or search for the live streaming with high personality charm when using the live streamer's personal charisma for product marketing diffusion. If done well, it can increase the probability of consumers' impulsive purchasing behavior. A perfect marketer not only needs excellent communication skills but also professional knowledge of the products they sell. This suggests that live streaming merchants should strengthen the professional knowledge learning of the live streamers, deeply understand product knowledge, master product functions, product usage methods, and product usage precautions, etc., in order to increase consumer favor and encourage consumers to have an impact on consumer behavior through positive normative evaluation. In summary, live streaming enterprises should establish a cultivation mechanism for the live streamer's personal character, in order to increase the occurrence of impulsive purchasing behavior when consumers watch live streaming.

Brand awareness has favorable and important effect over customers' impulsive purchasing behavior for live streaming. And the results further indicate that brand awareness has a positive and significant impact on consumer impulsive purchasing behavior in each group, grouped according to demographic variables. They are exact enough for the importance of brand awareness to be easily discernible in the situation of live streaming. As a consequence, for live streaming merchants, it is extremely important to choose products with high brand awareness for recommendation in the live streaming room. Product quality is the basic prerequisite for brand awareness. Live streaming merchants can promote and promote their products through various channels, provide pre-sales, sales, and after-sales services, improve product quality, ensure that the products are non-toxic, harmless, healthy, and safe, and win a good reputation for the product. This will increase the brand awareness of the product, enhance the positive impact of subjective norms, and promote consumers' impulsive purchasing intentions. Moreover, live streaming has become a widely accepted brand promotion method for the public. In order to attract more consumers to the brand during the live streaming process, more innovative ideas are needed to make users feel interesting when watching live streaming, attract consumers to watch for a long time, and increase consumers' memory of the brand. In order to further expand brand awareness and influence, and enhance the occurrence of impulsive purchasing behavior among consumers in live streaming.

The research results indicate that subjective norms have a significant positive impact on consumers'

impulsive purchasing behavior. In other words, for consumers, the more positive and active the impact of important people around them, the more likely they are to engage in impulsive purchasing behavior when watching live streaming in the live streaming room.

Meanwhile, the impact of the live streamer's personal charisma and brand awareness on consumer impulsive buying behavior is partially achieved through subjective norms, which are feasible as mediating variables between the live streamer's personal charisma and consumer impulsive buying behavior, as well as mediating variables between brand awareness and consumer impulsive buying behavior. These explanations indirectly affect consumers' impulsive purchasing behavior through subjective norms, so the greater the live streamer's personal charisma, along with the higher the brand awareness, the more impulsive purchasing behavior occurs among consumers under the background of live streaming. For live streaming merchants, it is important to value and cultivate consumers' love for this live streaming room, increase attention to consumers' personalities, communicate sincerely with consumers, understand the personality traits and psychological changes of the target customer group as comprehensively as possible, provide consumers with the personalized services they need, and gain satisfaction and trust, making every effort to reduce consumers' dissatisfaction with the products purchased from the live streaming room. Live streaming merchants should adopt different perspectives of socialization and new media marketing to enhance consumers' subjective norms in order to enhance their impulsive purchasing behavior. Cultivate consumers' liking for the live streamers and loyalty to the live streaming room, while providing more sharing channels for consumers, strengthening interaction between consumers and live streaming merchants, as well as between consumers and consumers, thereby promoting brand awareness and improving consumers' impulsive purchasing behavior.

The test results show that subjective norms do not have a mediating effect between premium content and impulsive purchasing behavior. In theory, without the influence of intermediary variables, the impact of premium content on impulsive purchasing behavior will not be weakened. For this reason, influencing potential consumers through providing high-quality live streaming content through live streaming e-commerce will have a direct and profound impact on impulsive purchasing behavior in the live streaming room, which is an important path. These findings are consistent with Nurhilal N's previous research (2021), which states that attractive content creation has a positive and significant impact on purchasing decisions^[31]. Consequently, live streaming merchants should pay attention to the issue of whether the live content is high-quality, whether the live content can attract consumers, and so on, because the variable of premium content has a positive and significant impact on consumers' impulsive purchasing behavior in the live streaming setting.

It is helpful to reveal the different effects of demographic variables on impulsive purchasing behavior by multi group analysis results. Due to the significant differences in the impact of demographic variables such as gender, age, educational level, personal disposable income, and duration of watching live streaming on different hypothetical paths, it is especially worthwhile for live streaming merchants to ponder on the specificity of the audience watching live streaming. To better promote consumers to engage in impulsive purchasing behavior, the key point is the implementation of differentiated marketing and precision marketing by live streaming merchants under the environment of live streaming. It is precisely because of individual characteristics that different consumers have different preferences and demands for the products recommended by the live streamer in the live streaming room. Under such circumstances, gender, age, educational level, personal disposable income, and duration of watching live streaming should be fully taken into consideration, the universal existence of this discrepancy has created the different influencing level of the live streamer's personal charisma, subjective norms, brand awareness and premium content resulting from various influencing factors, which have significant impacts on consumers' impulsive purchasing behavior. It is necessary for live streaming merchants to conduct targeted differentiation and precision marketing.

6. Limitations and future research

The limitation of the first study is that it did not consider the impact of differences in different social media platforms on consumers' impulsive purchasing behavior. The second restriction is that all respondents are Chinese who watch live streaming. The findings of the study may not be applicable to other countries or regions, and future research can be conducted in the same way in other countries. Last but not least, the third limitation of this study is the use of only the live streamer's personal charisma, subjective norms, brand awareness, and premium content to investigate consumers' impulse buying. Therefore, future research can be conducted to replace or add additional variables influencing impulsive buying behavior, in order to test the impact of consumer impulsive buying in the context of live streaming.

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