Hue University Journal of Science: Economics and Development
pISSN 2588-1205;eISSN 2615-9716
*Vol. 133, No. 5C, 2024, pp. 5–24, DOI: 10.26459/hueunijed.v133i5C.7386*

# EXAMINE THE FACTORS AFFECTING CUSTOMERS' IMPULSIVE BUYING BEHAVIORS IN LIVE STREAMING COMMERCE

**Tran Thi Nhat Anh*, Tran Van Hoa**

University of Economics, Hue University, 99 Ho Dac Di St., Hue, Vietnam

* Correspondence to Tran Thi Nhat Anh <nhatanhtran@hce.edu.vn>

(*Submitted: December 17, 2023; Accepted: April 2, 2024*)

**Abstract.** The rise of livestreaming trends has created a new business model known as livestreaming commerce, which is popular in Vietnam these days. However, little research has been done on impulsive buying behaviors in live streaming commerce, especially in the context of Vietnam. Using the Stimulus-Organism-Response (S-O-R) and Flow theories as foundations, this study develops a conceptual framework to examine the impact of livestreaming on consumers' impulsive purchasing behavior. In this study, Partial Least Square – Structural Equation Modeling (PLS-SEM) was used to analyze data from the questionnaire survey of 363 customers who are familiar with live streaming platforms in Vietnam. By using SmartPLS for data empirical evaluation and hypotheses testing, research shows that the social presence of a live streaming platform and scarcity have a positive impact on consumer's flow states, hence inducing consumers' impulsive buying behaviors. E-tailers and live streamers may find this research useful in understanding customer's buying behaviors and efficiently developing an action strategy for the long-term growth of live streaming commerce.

**Keywords:** social presence, impulsive buying behavior, scarcity, live streaming, Flow theory, S-O-R theory

## 1 Introduction

Thanks to the remarkable growth of technology and the information technology foundation, e-commerce has appeared as an innovative commercial method. Vietnamese consumers have become familiar with online shopping habits, especially in the context of Covid-19. In 2022, Vietnam's economic growth, both in commerce and services, stood at only 2.58%, the lowest in 30 years [1]. However, Vietnam's e-commerce has maintained a steady growth rate of 16%, reaching a B2C e-commerce market scale of $13.7 billion in 2022, expected to triple by 2025 to $39 billion, making it the second largest market in Southeast Asia for e-commerce.

The report by Decision Lab revealed that 69% of Vietnamese audiences spend more time watching and shopping via live streaming, a trend significantly more popular than using live streaming for entertainment or product information [2]. Live streaming has become a dominant competitive trend in sales across e-commerce platforms and social media networks since 2019. Covid-19 facilitated the significant development of live streaming sales in Vietnam, with approximately 2.5 million live streaming shopping sessions monthly involving 50,000 product

suppliers and 70,000-80,000 live streaming sessions daily. The convenience and interactive nature of shopping through live streaming stimulate impulsive buying behavior [3]. Consequently, studying impulsive buying behavior within this platform has become crucial, yet research in this area, especially in Vietnam, remains limited.

Lin's study explores how customers' psychological processes influence impulsive buying behavior during live streams, particularly via the perspective of influencers [3]. The research applies the Stimulus-Organism-Response (S-O-R) theory to elucidate how various stimuli, such as needs, convenience, interaction, and enjoyment impact customers' psychological responses, which influence impulsive buying behavior. Ming et al. found that impulsive buying behavior is affected by social presence during a live stream, specifically the social presence of the live stream platform, viewers, and live streamers [4]. It explores how telepresence affects consumer trust and mood, ultimately impacting impulsive buying behavior, moderated by the consumer's power. Zhang and Huang build upon S-O-R theory and the affective-cognitive framework, investigating how social presence of streamers, viewers, and products affects affective and cognitive systems, subsequently influencing impulsive buying behavior during live streams [5, 6]. While Liu et al. highlight the professionalism of hosts and social presence, directly impacting impulsive buying behavior during live streaming [7]. They also discuss how consumers' competitive arousal moderates the relationship between host professionalism and social presence. Li et al. focus on S-O-R and motivation theory, emphasizes the streamer's attractiveness and real-time interaction, affecting hedonic and utilitarian feelings and directly influencing impulsive buying behavior [8].

These studies collectively emphasize the significant social presence's performance in impulsive buying behavior during live streaming. However, despite this attention, there's a dearth of research, especially in Vietnam, on the relationship between social presence, scarcity, and impulsive buying behaviors. Since current research in Vietnam primarily focuses on general online shopping behaviors rather than specifically on impulsive buying through live streaming. A few studies delve into various factors affecting impulsive online buying behaviors with the aspects of product availability, visual appeal, ease of use, spontaneity, credibility, immediate perception, and cultural aspects [9, 10]. Yet they have rarely provided a thorough and empirical comprehension of what factors affect customers online impulsive buying behaviors via live streaming by applying both S-O-R and Flow theory. More importantly, it is noteworthy that, no prior research endeavors have explored the effect of social presence, scarcity, and flow state on impulsive buying behaviors in Vietnam's live streaming commerce.

Consequently, it is essential to explore these perspectives, particularly on live streaming platforms, in detail. This gap presents a crucial area for both theoretical and practical research for academics and business managers alike.

To connect the research gap, this research on the topic of impulsive buying behaviors in live streaming platforms is carried out in Vietnam, focusing on social presence and scarcity. This

research's aim is to examine how social presence exerts on consumer's impulsive buying behaviors in live streaming platforms, applying the S-O-R and Flow theory frameworks. Two following research questions will be examined in this study.

*RQ1:* What factors influence impulsive buying behaviors on live streaming platforms?

*RQ2:* What is the relationship between the flow state and impulsive buying behaviors in a live streaming platform?

## 2 Theoretical backgrounds

### 2.1 Definition of impulsive buying behavior

Impulsive buying is considered the out-of-sudden purchase when customers decide without any pre-purchase intention as a result of a stimulus [11]. According to Parboteeah et al., impulse buying is often made by spontaneous decisions, buying triggered by emotional desire rather than rational decision-making. In his study, online impulse buying occurs in an IT-mediated environment (shopping environment), such as a website, individual characteristics cues, and environmental stimulus [12].

In Stern's, he clarifies impulsive buying as "any purchase which a shopper makes but has not planned in advance" [13]. He classifies four sorts of impulse buying behaviors, such as pure, reminder, suggestion, planned impulse buying. Pure impulse buying is the most distinguished kind, which differentiates from the normal buying pattern, and shoppers are influenced mainly by the emotional appeals of the products. Reminder impulse buying happens when shoppers by chance see an item at the shop and recall some prior experience with the product, such as low stock or knowledge of it, which sparks the impulse purchase. The suggestion impulse occurs when shoppers purchased the items due to their rational or functional appeal at the point of sale. Planned impulse buying occurs when they transfer purchase planning from the house to the store when taking advantage of promotion.

Beatty and Ferrell imposed that : "Felt urge to buy impulsively is a state of desire that is experienced upon facing an object in the environment [14]." Similar to Stern, Badgaiyan and Verma also suggested that customer's impulsive behavior often occurs when they are in the shop [15]. Verhagen and van Dolen declared online impulse buying as a "sudden and immediate online purchase with no prior intention, meaning unplanned, spontaneous, and decided on the spot" [16]. In addition, he points out the importance of information processing by customers. They should perceive and know the stimuli, process and get used to it, and then react to online impulsive purchase behavior.

### 2.2 Social presence as the main themes in live streaming

Social presence is defined in two categories: physical presence the feeling of "being there"; social presence the feeling of "being there with others and interpersonal interactions" [17]. Live streaming emerges as a viable tool for online promotion and shopping, offering consumers an online face-to-face experience in shopping with interpersonal interactions within real-time. This immersive platform serves as a dynamic space where individuals across various social strata can gather information, socialize, and confidently make the buying decision via engaging the design of content, interface, and interaction. In contrast to traditional e-commerce formats like TV shopping, live streaming eliminates the need for pre-broadcast preparation and technical complications, enhancing realism and immersion of the experience. Social presence can make viewers feel connected and warm despite no physical human connection. Live streaming has a feature real-time interaction via video; hence, viewers can comment in real-time and during broadcasting, both live streamers and other viewers can notice those comments, which increase the live streamer's ability to respond efficiently. During this process, users might build a strong tie with the live streamers and other viewers, aided by telecommunication [18].

### 2.3 Stimulus- Organism- Response (SOR) theory

Numerous studies apply the Stimulus-Organism-Response (S-O-R) theory to suggest that environmental signs act as stimuli influence the reactions from cognitive and affective aspects, hence later affect their behaviors. Woodworth firstly proposed the theory [19] traditionally and this is updated in 1974 by Mehrabian and Russell [20] until Jacoby added the organism's element which helps to explain how environmental stimuli affect human cognitive and affective state [21]. "Stimulus" known as the environmental factors that evoke internal states. Another research have showed that the real- time connection among all agents such as viewers, anchors and live streaming platform in live streaming provide viewers with a feeling of presence, which later exerts on consumer's attitude and buying intentions [4, 22]. Besides, while watching live streaming, scarcity promotion such as flash sales with timers, limited product edition is the most important factors that consumers prefer to gain [23]. Hence, this research refers presence and scarcity promotion as the stimulus.

The term "organism" is being described as the logical and emotional phases of human that interfere this impact of environmental stimuli on their response. The emotional phase is linked with the affective response whereas the intellectual period is relevant to the process of reacting the stimulus mentally. Here, this study explore the affective states which mainly studied in most studies [12, 24, 25]; in live streaming context.

"Response" is defined as the last decision of individuals depending on the affective state. For e-commerce context, consumer behaviors are frequently classified as purchase intention,

impulsive purchase intention and intention to return are mostly discussed [26]. This study focuses on impulsive buying behaviors.

### 2.4 Flow theory

In addition, the affective factor in this study is based on flow theory. "Flow" is described as the psychological phase happening when one is engaged and enjoys the task [27]. Here, the study applied the meaning of flow state from two characteristics: the focus and the enjoyment during the task [27]. This theory describes when viewers are in a good mood, they may react emotionally to environmental stimulus, hence decide to buy impulsively. Thus, flow state contributes to a significant factor when the impulse buying behavior is formed. It suggests that consumers love watching an exciting live broadcast and immersing in this online social participation. These enjoyable feelings prolong the consumer's attention and enhancing their stimulus of exposure. This will let consumers experience a strong demand to make impulse buying behavior. "Shoppertainment" is a hot topic in the e-commerce context where most customers find joyful and entertained while watching live streaming, which in turn affects positively their emotions and mental processes and leads to impulsive buying behaviors.

## 3 Conceptual model and hypothesis development

### 3.1 Social presence of live streaming platform and the flow state

During live streaming, it can create human contact, warmth, and sociability [4]. Thanks to technology, the platforms send both audio and video signals from a remote location in real-time, creating an immersive experience for viewers who feel as if they are present at the event [28]. The shared experience of watching live streams with others, known as co-experience, can enhance the viewing experience by giving a community and social interaction. Such highlighting the mission of social and psychological factors in shaping users' enjoyment suggests ways to enhance co-experience and reflectance through design features and incentives [29]. This study suggests the positive link between the social presence of live streaming commerce and the flow state as:

*H1*: Social presence of a live streaming platform has a positive link with flow state during live streaming.

### 3.2 Social presence of viewers has an impact on the flow state

Compared to traditional commerce, when buying online, consumers are not able to physically touch the products or try them on. However, communication in live streaming commerce makes online shopping easier. By reading the comments of other viewers in the chat box, viewers can be well-informed by the feedback of the products from other viewers, the statistics number of viewers' statistics who liked and purchased the products. This interactivity would engross the

social presence during live streaming. Consumers are immersed in positive experiences and generate a flow state. Previous studies have affirmed this link between social presence of viewers and flow state [4, 30].

*H2*: Social presence of viewers has a positive link with flow state during live streaming.

### 3.3 Social presence of streamers and the flow state

Streamers take a significant part in leading and presenting the products to viewers during live streaming, as the most crucial factor in contributing to the live streaming's success.

Numerous studies pointed out the importance of streamers into different categories: streamers' attractiveness [3, 6, 31, 32], interactivity and community [33, 34], expertise [35]. These characteristics of streamers positively increase the engagement and immersion of viewers while watching live versions, two-way interaction compared with TV broadcasts, thus evoking the positive flow state as well.

*H3*: Social presence of live streamers has a positive link with flow state in live streaming.

### 3.4 Scarcity

When compared to traditional shopping, live streaming e-commerce evokes consumers' emotions when creating limited time and products for them to make decisions, and they risk missing out on a great opportunity to score a deal when live streaming ends. In live streaming, streamers will provide viewers with a real-time number of product stocks and a countdown time limited to viewers via interactive designs, more importantly emphasizing the high desire for that product. These acts will raise the consumers' awareness of scarcity and thus provoke their impulse buying behavior [5, 36]. The fear of missing out (FOMO) is mentioned as the mechanism of mediation in the relationship between scarcity and impulsive buying, indicating the consumer's anxiety of losing the chance the others get [37]. Prior studies have established a connection between scarcity; thus heightened enjoyable affections [38, 39]. However, limited research has addressed this link between scarcity and flow state during real-time broadcasting. Therefore, this study will focus on this relationship between scarcity and flow state.

*H4*: Scarcity positively correlates with flow state in live streaming.

### 3.5 Flow state and impulsive buying behavior

When consumers are in a flow state, they can prompt spontaneous purchases, since positive emotions amplify consumers' inclination to make impulsive buying decisions. It is a psychological state when an individual reacts to environmental stimuli. Previous studies have pointed out the link between flow state, impulsive buying behaviors, and customer satisfaction online [4, 32]. Thus, this hypothesis is provided.

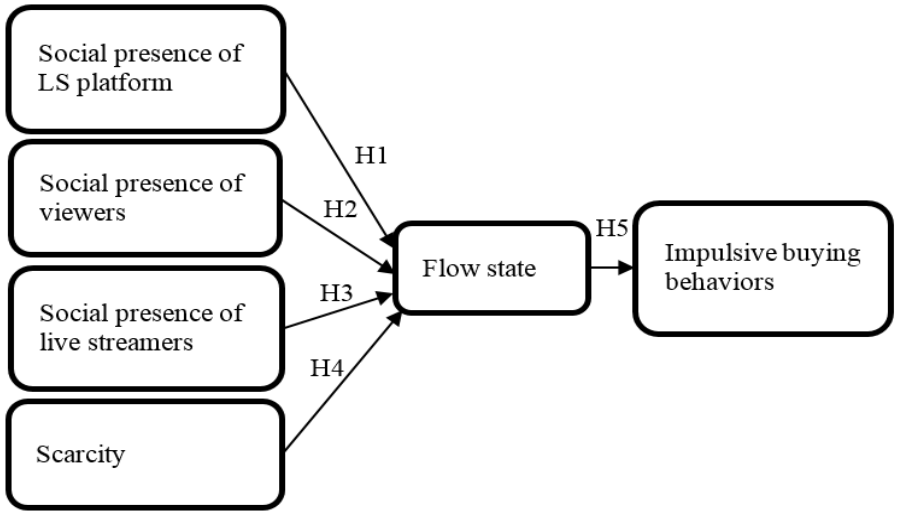


**Figure 1.** Conceptual model

*H5*: Flow state relates to impulsive buying behavior in live streaming.

## 4 Methodology

Before conducting the survey, preliminary research was conducted involving five experts in the live streaming field, comprising marketing experts, online store owners, live streamers, and ten customers, including five students from 18–22 and five office employees aged 26–35, all of whom frequently watch live streaming for shopping. The reason why these groups were chosen is that customers from 18–35 have the most tendency to watch and buy products online. According to Statista's report, the social commerce buyers in Vietnam were in the age 25–34 group, accounting for the highest proportion of 42%, followed by the 18–24 group with 32%, who represented the second largest demographic in the distribution [40].

The questions used to interview these groups aimed to refine sections within the survey and eliminate unclear content on the scale. Their feedback and opinions helped in revising and selecting variables in the research model. The scales utilized followed a 5-point Likert scale, starting from 1 (strongly disagree) to 5 (strongly agree). These scales were collected from prior research and translated into Vietnamese, with adjustments made to match the live streaming commerce industry in the Vietnamese context.

### 4.1 Data collection

Given that this is a new channel of online shopping, accessing and estimating the population of customers in live streaming is not attainable, a convenience sampling method is applied by distributing online survey questionnaires to customers who have watched or are

currently watching live streaming while making online purchases. Online questionnaires were distributed via the Facebook platform. Specifically, to aim for online customers, the researchers sent out the survey in the Facebook community of sales and online customers, as well as via acquaintances who frequently watch and buy via livestream. The survey data was analyzed using Smart PLS 4.0 software after preliminary research to refine and develop the research model. Table 1 illustrates the participants' demographic characteristics.

**Table 1.** The participants' demographic characteristics

| Criteria | Groups | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Male | 75 | 20.7 |
| | Female | 288 | 79.3 |
| Age | 18–25 | 166 | 45.7 |
| | 26–35 | 108 | 29.8 |
| | 36–45 | 66 | 18.2 |
| | Up to 45 | 22 | 6.1 |
| Frequency to watch live streaming | Once per month | 93 | 25.6 |
| | 2–3 times/ month | 150 | 41.3 |
| | 4–6 times/ month | 60 | 16.5 |
| | > 6 times/ month | 60 | 16.5 |
| Live streaming channels | Shopee | 226 | 30 |
| | Lazada | 73 | 9.7 |
| | TikTok | 253 | 33.6 |
| | Facebook | 201 | 26.7 |
| **Total** | | **363** | **100** |

Among 363 respondents, over 79% were female and nearly 21% were male. The age distribution of the survey participants aligns with online shopping behaviors during live streaming, with the majority being young adults aged 18–25, constituting 45.7%, followed by the age group of 26–35, comprising 29.8% [41]. These two age groups represent a significant proportion, characterized by curiosity and a penchant for technology, leading to more time spent browsing and making online purchases compared to other age groups in Vietnam [2]. In terms of frequency, they tend to spend their time to watch 2–3 times per month (41.3%), from 4-6 times or more than 6 times per month, taking account for 34%. TikTok is the most popular channel that they choose to watch live streaming and buy products (33.6%), followed by Shopee (30%), Facebook (26.7%), and Lazada (9.7%).

### 4.2 Measurement

All items are based on previous research, with some changes when translating from English to Vietnamese for better understanding. As well as adapting some differences from the Vietnamese live streaming context based on the feedback of experts in the marketing field and customers. The social presence of live streaming platforms is measured from the study of [42], with five items. The social presence of viewers and live streamers is adapted from [43] with three items each. Scarcity is measured from the study of Chen et al. with five items. Flow state is adapted from [26] with six items from two stages: concentration and enjoyment state. Impulsively buying behaviors are measured from the study of [44] with four items. The appendix shows all the items with explanations.

### 4.2 Data analysis method

The Partial Least Squares Structural Equation Modeling (PLS-SEM) is used in this study instead of the Covariance-based SEM model, owing to its advantages in application for small sample sizes and not requiring normally distributed data [45, 46]. This method ensures greater theoretical simplicity and reduces model complexity [47]. Additionally, PLS exhibits flexibility in dealing with reflective and formative constructs [48]. By utilizing PLS, the research sample necessitates a minimum of 10 times the number of variables in this structure [49]. The study sample size is 363, meeting these criteria for analysis using this method.

### 4.3 Convergent and discriminant validity

In the PLS-SEM model, the composite reliability (CR) coefficient and Cronbach's alpha are used, and it should be ensured that both coefficients should be 0.7 or higher for the scale to be considered reliable [50]. The convergence validity is tested by using the average variance extracted (AVE), which has to be greater than or equal to 0.5 [51]. In Table 2, the results are presented that all composite reliability (CR) and Cronbach's alpha values are greater than 0.7, which means these items in the model are reliable. The same for AVE, all the factor loadings for convergent validity are greater than 0.5, which indicates excellent convergent validity.

The Heterotrait-monotrait ratios of correlations (HTMT) are considered to examine discriminant validity better, where the value of HTMT must be less than 0.85 to ensure the discriminant validity is constructed [46]. Table 3 reflects the values of HTMT, which all satisfy the requirements and show that this study is well-established with good discriminant validity.

**Table 2.** Reliability and convergent validity

| Key variables | Cronbach's alpha | Rho_A | CR Composite reliability | AVE |
|---|---|---|---|---|
| Social presence of viewers (SPV) | 0.715 | 0.726 | 0.842 | 0.641 |
| Social presence of live streamers (SPL) | 0.723 | 0.73 | 0.844 | 0.645 |
| Social presence of live streaming platform (SPP) | 0.844 | 0.851 | 0.889 | 0.616 |
| Scarcity (SC) | 0.74 | 0.74 | 0.852 | 0.658 |
| Flow state (FS) | 0.866 | 0.868 | 0.899 | 0.598 |
| Impulsive buying behavior (IB) | 0.809 | 0.812 | 0.875 | 0.637 |

**Table 3.** Discriminant validity (HTMT)

| Key variables | FS | IB | SC | SPL | SPP | SPV |
|---|---|---|---|---|---|---|
| FS | | | | | | |
| IBB | 0.708 | | | | | |
| SC | 0.609 | 0.683 | | | | |
| SPL | 0.537 | 0.383 | 0.582 | | | |
| SPP | 0.626 | 0.479 | 0.649 | 0.855 | | |
| SPV | 0.283 | 0.398 | 0.364 | 0.473 | 0.482 | |

**Notes*: Social presence of viewers (SPV), Social presence of live streamers (SPL), Social presence of live streaming platform (SPP), Scarcity (SC), Flow state (FS), Impulsive buying behavior (IB)

## 4 Results of proposed hypotheses

These hypotheses will be examined by using the structural equation model (SEM) with the suitable fit (SRMR) for all values. Out of five hypotheses, two hypotheses (H2 and H3) are rejected with $p > 0.05$, as shown in Table 4. The social presence of live streaming significantly exerts on the flow state with ($\beta = 0.346$, $p < 0.05$) supporting H1. Similarly, a positive impact of Scarcity on the flow state ($\beta = 0.286$, $p < 0.05$) is presented which supports H4. The flow states significantly affect the impulsive buying behavior ($\beta = 0.595$, $p < 0.05$) supporting H5. Figure 2 shows $R^2$ of flow state is 0.350 and the $R^2$ of impulsive buying behavior is 0.352 which means that the level of flow state in the four stimulus aspects can explain 35% of the variance. Similarly, the impulsive buying behavior's measurement in flow state can explain 35.2% of the variance, meaning the model remains an acceptable explanatory power.

The findings confirm that social presence of livestreaming platforms and scarcity can predict customer flow state and impulsive buying behavior. However, we do not find out the relationship between social presence of live streamers, social presence of viewers, and flow state.

**Table 4.** Hypothesis results

| Hypotheses | Relationship | β | T value | P value | Conclusion |
|---|---|---|---|---|---|
| H1 | SPP -> FS | 0.346 | 5.033 | 0 | Supported |
| H2 | SPV -> FS | -0.004 | 0.088 | 0.93 | Not supported |
| H3 | SPL -> FS | 0.072 | 1.107 | 0.268 | Not supported |
| H4 | SC -> FS | 0.286 | 5.068 | 0 | Supported |
| H5 | FS -> IB | 0.595 | 16.321 | 0 | Supported |

* *Notes*: Social presence of viewers (SPV), Social presence of live streamers (SPL), Social presence of live streaming platform (SPP), Scarcity (SC), Flow state (FS), Impulsive buying behavior (IB)

In the case of the social presence of livestreamers, another plausible explanation is that to attract customers, livestreamers may give false information, such as followers and transaction volumes, in order to persuade their customers to buy products. Even some customers have to deal with quality issues after purchasing service. Such problems might reduce the customers trust in live streamers. Moreover, in some cases, most consumers, while entering a live stream, only watch and engage with the broadcasters, not for buying purposes. This finding is similar to Lee & Chen and Hu & Chaudhry's finding in 2021 [52, 53]. The findings confirm that social presence of livestreaming platforms and scarcity can predict customer flow state and impulsive buying behavior. However, we do not find out the relationship between social presence of live streamers, social presence of viewers, and flow state.

As for the social presence of viewers, some reasonable explanation is that customers somehow suspect the motives of reavealing good comments towards the product during livestream; thus, these comments and interactions from viewers during livestream are not used by the customers to make decisions. This result is similar to Li & Cao's research in 2022 [8].

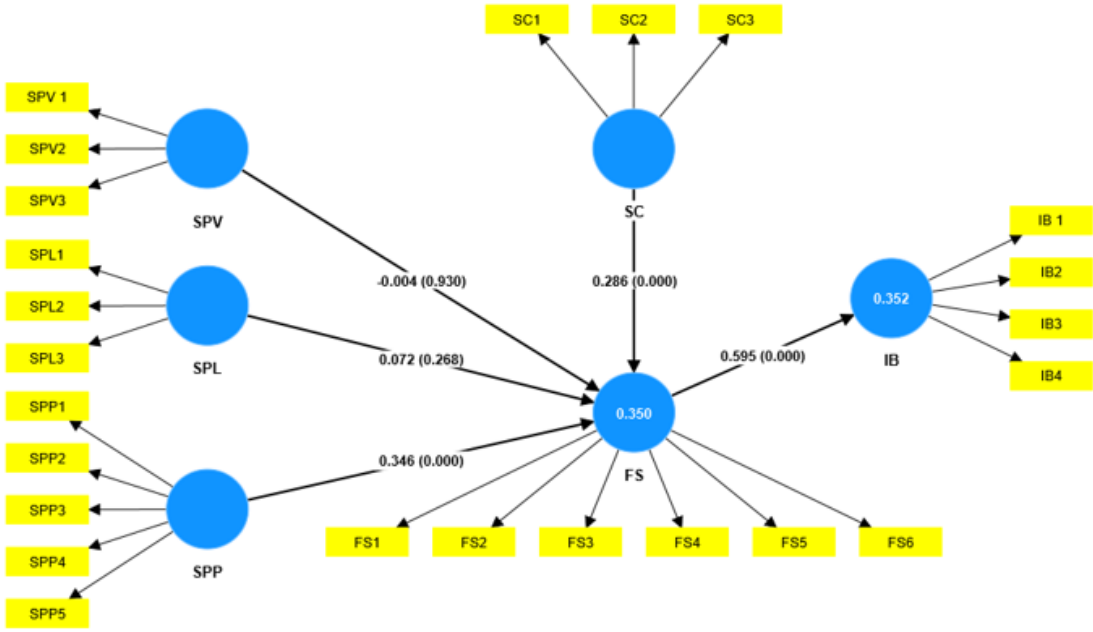


**Figure 2.** Path coefficient test results

## 5 Theoretical implications

This research has such various theoretical implications. Firstly, this research increases the literature review in live streaming activities by finding the factors that affect impulsive buying behavior. Many studies present the consumer's incentives in lives streaming such as customer's demand, convenience, interactivity, playfulness [24], or such stimulus such as price promotion, time limit promotion, perceived opportunity cost, customer-live streamers' connection, viewers and viewers interaction, visual appearance [6]. However, few studies in Vietnam have discussed impulsive buying behavior in a live streaming context. Hence, this study enriches the live streaming context literature in Vietnam.

Secondly, this research contributes to the knowledge of social presence by exploring its act in live streaming context. While other studies only address the social presence of viewers and live streamers [3, 28, 54], this study focuses on the social presence of live streaming platforms. Our aim is to identify and explain the relationship between the social presence of platforms, the social presence of streamers, the social presence of viewers, and impulsive buying behaviors. Even though the results found that there is no relationship between the social presence of streamers, viewers, and impulsive behaviors via flow state, these results give some insights for future research.

Thirdly, this study combines the SOR and Flow theories to explore the mechanism creating impulsive buying behavior. Not too many theories include both theories in understanding the

link between flow state and impulsive buying behaviors in order to better explain how consumers make decisions while watching live streaming.

## 6 Managerial implications

The findings of this research have significant implications for e-retailers and marketing managers. To begin with, this research proves that the social presence of live streaming platforms exerts an impact on live streaming activities. This presence can shorten the physical separation among live streamers and viewers. Therefore, the benefits of increasing the level of hedonic experiences thus might affect the customer's impulsive buying behavior. In order to gain from that aspect, live streamers are expected to create a warm and friendly atmosphere in order to build the viewer's interactivity and community. For e-retailers, they might consider searching for a live streamer with a bright personality and good communication skills to enhance the connection during live streaming.

Moreover, the findings insist on the importance of scarcity in adjusting the customer's flow state. When viewers notice the limited amount of products of time while watching live streaming, the fear of missing out (FOMO) effect arouses, which forces customers to focus and be engrossed in watching and buying products. Thus, establishing a script and step-to-step scenario to create an exciting and interactive live streaming commerce is necessary to make sure viewers feel the limited time and products ahead while watching, thus evoking an impulsive buying mood to buy products. Creating hot deals with a low price and mini games such as give-away during the first stage of live streaming to increase customer's watching time and provoke their desires to buy impulsively.

Lastly, the finding implies the strong relationship between the flow state and the impulsive buying behaviors via SOR and the flow state. This result exactly applies to the live streaming commerce in Vietnam, where customers find shopping online as entertainment therapy with a "Shoppertainment" experience. Thus, live streamers should interact and create a friendly and humorous environment for customers to receive more positive energy while watching live streaming, thus increasing their impulsive buying behaviors.

## 7 Limitation and future research

This study has some limitations, such as this focus on the broader approach with research on customers behaviors while watching live streaming on all channels. However, there might be differences between customer's impulsive buying behaviors when they watch live streaming in different channels, such as TikTok, Facebook's social commerce platform, versus Shopee, and Lazada e-commerce platforms. Therefore, a more in-depth study can focus more on specific platforms to better understand customers in different contexts. Moreover, the studies only

investigate based on quantitative methods; more qualitative or mixed methods should be applied to explore live streaming commerce in Vietnam since it is still in the early stage of development.

## References


1. Vietnam's Economy Forecast to Grow 7.5% in 2022, New World Bank Report Says, World Bank. Accessed: Mar. 29, 2024. [Online]. Available: https://www.worldbank.org/en/news/press-release/2022/08/08/vietnam-s-economy-forecast-to-grow-7-5-in-2022-new-world-bank-report-says.
2. Decision Lab, Vietnam: live stream watching duration 2022, Statista. Accessed: Mar. 29, 2024. [Online]. Available: https://www.statista.com/statistics/1301396/vietnam-average-time-spent-watching-a-live-stream-session/.
3. Li, L., Kang, K., Zhao, A., and Feng, Y. (2023), The impact of social presence and facilitation factors on online consumers' impulse buying in live shopping – celebrity endorsement as a moderating factor, *Inf. Technol. People*, 36(6), 2611–2631, doi: 10.1108/ITP-03-2021-0203.
4. Ming, J., Jianqiu, Z., Bilal, M., Akram, U., and Fan, M. (2021), How social presence influences impulse buying behavior in live streaming commerce? The role of S-O-R theory, *Int. J. Web Inf. Syst.*, 17(4), 300–320, doi: 10.1108/IJWIS-02-2021-0012.
5. Zhang, J., Jiang, N ., Turner, J. J., and Pahlevan-Sharif, S. (2022), The Impact of Scarcity on Consumers' Impulse Buying Based on the S-O-R Theory, *Front. Psychol.*, 13, 792419, doi: 10.3389/fpsyg.2022.792419.
6. Huang, Y. and Suo, L. (2021), Factors Affecting Chinese Consumers' Impulse Buying Decision of Live Streaming E-Commerce, *Asian Soc. Sci.*, 17(5), 16, doi: 10.5539/ass.v17n5p16.
7. Liu, C., Zhang, Y., and Zhang, J. (2020), The impact of self-congruity and virtual interactivity on online celebrity brand equity and fans' purchase intention, *J. Prod. Brand Manag.*, 29(6), 783–801.
8. Li, M., Wang, Q., and Cao, Y. (2022), Understanding Consumer Online Impulse Buying in Live Streaming E-Commerce: A Stimulus-Organism-Response Framework, *Int. J. Environ. Res. Public. Health*, 19(7), 4378, doi: 10.3390/ijerph19074378.
9. T. Q. Tran (2021), Factors influence on customer purchase intention via livetream: Case of vietnam, *Int. J. Manag. Entrep. Res.*, 3(7), 253–265, doi: 10.51594/ijmer.v3i7.245.
10. Trung P. Q. and Ha N. N. H. (2017), Factor Affecting Impulsive Online Buying Behavior of Consumer in Ho Chi Minh city, *Ho Chi Minh city Open University Journal of Science*, 12(3).
11. Karbasivar, A. and Yarahmadi, H. (2011), Evaluating Effective Factors on Consumer Impulse Buying Behavior.
12. Parboteeah, D. V., Valacich, J. S., and Wells, J. D. (2009), The Influence of Website Characteristics on a Consumer's Urge to Buy Impulsively, *Inf. Syst. Res.*, 20(1), 60–78.

13. Stern, H. (1962), The significance of impulse buying today, *J. Mark.*, 26(2), 59–62.
14. Beatty, S. E. and Elizabeth Ferrell, M. (1998), Impulse buying: Modeling its precursors, *J. Retail.*, 74(2), 169–191, doi: 10.1016/S0022-4359(99)80092-X.
15. Badgaiyan, A. J. and Verma, A. (2015), Does urge to buy impulsively differ from impulsive buying behaviour? Assessing the impact of situational factors, *J. Retail. Consum. Serv.*, 22, 145–157, doi: 10.1016/j.jretconser.2014.10.002.
16. Verhagen, T. and Van Dolen, W. (2011), The influence of online store beliefs on consumer online impulse buying: A model and empirical application, *Inf. Manage.*, 48(8), 320–327, doi: 10.1016/j.im.2011.08.001.
17. Lombard, M. and Ditton, T. (1997), At the heart of it all: The concept of presence., *J. Comput.-Mediat. Commun.*, 3(2), p. No Pagination Specified-No Pagination Specified.
18. Xu, X., Huang, D., and Shang, X. (2021), Social presence or physical presence? Determinants of purchasing behaviour in tourism live-streamed shopping, *Tour. Manag. Perspect.*, 40, 100917, doi: 10.1016/j.tmp.2021.100917.
19. Woodworth, R. S. (1929), *Psychology (revised edition), Henry Holt and Co*.
20. Russell, J. A. and Mehrabian, A. (1974), Distinguishing anger and anxiety in terms of emotional response factors., *J. Consult. Clin. Psychol.*, 42(1), 79–83, doi: 10.1037/h0035915.
21. Jacoby, J. (2002), Stimulus-organism-response reconsidered: an evolutionary step in modeling (consumer) behavior, *J. Consum. Psychol.*, 12(1), 51–57.
22. Gao, W., Liu, Y., Liu, Z., and Li, J. (2018), How does presence influence purchase intention in online shopping markets? An explanation based on self-determination theory, *Behav. Inf. Technol.*, 37(8), 786–799, doi: 10.1080/0144929X.2018.1484514.
23. Muhammad, A., S., Adeshola, I., and Isiaku, L. (2023), A mixed study on the 'wow' of impulse purchase on Instagram: insights from Gen-Z in a collectivistic environment, *Young Consum.*, doi: 10.1108/YC-04-2023-1728.
24. Lin, S.-C., Tseng, H.-T., Shirazi, F., Hajli, N., and Tsai, P.-T. (2023), Exploring factors influencing impulse buying in live streaming shopping: a stimulus-organism-response (SOR) perspective, *Asia Pac. J. Mark. Logist.*, 35(6), 1383–1403, doi: 10.1108/APJML-12-2021-0903.
25. Yu, C., Cheah, J.-H., and Liu, Y. (2022), To stream or not to stream? Exploring factors influencing impulsive consumption through gastronomy livestreaming, *Int. J. Contemp. Hosp. Manag.*, 34(9), 3394–3416, doi: 10.1108/IJCHM-09-2021-1137.
26. M. Koufaris (2002), Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior, *Inf. Syst. Res.*, 13(2), 205–223, doi: 10.1287/isre.13.2.205.83.
27. Ghani, J. A., Supnick, R., and Rooney, P., The experience of flow in computer-mediated and in face-to-face groups.

28. Huang, Z., Zhu, Y., Hao, A., and Deng, J. (2023), How social presence influences consumer purchase intention in live video commerce: the mediating role of immersive experience and the moderating role of positive emotions, *J. Res. Interact. Mark.*, 17(4), 493–509, doi: 10.1108/JRIM-01-2022-0009.
29. Bründl, S., Matt, C., and Hess, T. (2017), Consumer use of social live streaming services: the influence of co-experience and effectance on enjoyment.
30. Li, B., Hou, F., Guan, Z., and Chong, A. Y.-L. (2018), What Drives People to Purchase Virtual Gifts in Live Streaming? The Mediating Role of Flow.
31. Guo, Y., Zhang, K., and Wang, C. (2022), Way to success: Understanding top streamer's popularity and influence from the perspective of source characteristics, *J. Retail. Consum. Serv.*, 64, 102786, doi: 10.1016/j.jretconser.2021.102786.
32. Xu, X., Wu, J. -H., and Li, Q. (2020), What drives consumer shopping behavior in live streaming commerce?, 21(3).
33. Chen, H., Zhang, S., Shao, B., Gao, W., and Xu, Y. (2022), How do interpersonal interaction factors affect buyers' purchase intention in live stream shopping? The mediating effects of swift guanxi, *Internet Res.*, 32(1), 335–361, doi: 10.1108/INTR-05-2020-0252.
34. Lv, X., Zhang, R., Su, Y., and Yang, Y. (2022), Exploring how live streaming affects immediate buying behavior and continuous watching intention: A multigroup analysis, *J. Travel Tour. Mark.*, 39(1), 109–135, doi: 10.1080/10548408.2022.2052227.
35. Guo, Y., Zhang, K., and Wang, C. (2022), Way to success: Understanding top streamer's popularity and influence from the perspective of source characteristics, *J. Retail. Consum. Serv.*, 64, 102786, doi: 10.1016/j.jretconser.2021.102786.
36. Lo, P.-S., Dwivedi, Y. K., Wei-Han Tan, G., Ooi, K.-B., Cheng-Xi Aw, E., and Metri, B. (2022), Why do consumers buy impulsively during live streaming? A deep learning-based dual-stage SEM-ANN analysis, *J. Bus. Res.*, 147, 325–337, doi: 10.1016/j.jbusres.2022.04.013.
37. Zhang, J., Jiang, N., Turner, J. J., and Pahlevan-Sharif, S. (2022), The Impact of Scarcity on Consumers' Impulse Buying Based on the S-O-R Theory, *Front. Psychol.*, 13, 792419, doi: 10.3389/fpsyg.2022.792419.
38. Li, X., Guo, M., and Huang, D. (2023), The role of scarcity promotion and cause-related events in impulse purchase in the agricultural product live stream, *Sci. Rep.*, 13(1), 3800, doi: 10.1038/s41598-023-30696-8.
39. Adeshola, A. S. I., and Isiaku, L. (2023), A mixed study on the 'wow' of impulse purchase on Instagram: insights from Gen-Z in a collectivistic environment, *Young Consum.*, doi: 10.1108/YC-04-2023-1728.
40. Statista, Social Media Report in Vietnam 2020 | Market Report IO. Accessed: Mar. 28, 2024. [Online]. Available: https://marketreport.io/social-media-report-vietnam-2020.

41. Social Media Report in Vietnam 2020 | Market Report IO, Accessed: Mar. 28, 2024. [Online]. Available: https://marketreport.io/social-media-report-vietnam-2020.

42. Sun, Y., Shao, X., Li, X., Guo, Y., and Nie, K. (2019), How live streaming influences purchase intentions in social commerce: An IT affordance perspective, *Electron. Commer. Res. Appl.*, 37, 100886, doi: 10.1016/j.elerap.2019.100886.

43. Ye, S., Lei, S. I., Shen, H ., and Xiao, H. (2020), Social presence, telepresence and customers' intention to purchase online peer-to-peer accommodation: A mediating model, *J. Hosp. Tour. Manag.*, 42, 119–129, doi: 10.1016/j.jhtm.2019.11.008.

44. Verplanken, B. and Herabadi, A. (2001), Individual differences in impulse buying tendency: feeling and no thinking, *Eur. J. Personal.*, 15, 1_suppl, S71–S83, doi: 10.1002/per.423.

45. Hair, J., Hult, G. T. M., Ringle, C., and Sarstedt, M. (2016), *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), 2nd edition*.

46. Henseler, J., Ringle, C., and Sinkovics, R. (2009), The Use of Partial Least Squares Path Modeling in International Marketing, in *Advances in International Marketing*, 20, 277–319. doi: 10.1108/S1474-7979(2009)0000020014.

47. Wetzels, M. and Odekerken, G. (2009), Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration, *Manag. Inf. Syst. Q. - MISQ*, 33, doi: 10.2307/20650284.

48. Zheng, Y., Zhao, K., and Stylianou, A. (2013), The impacts of information quality and system quality on users' continuance intention in information-exchange virtual communities: An empirical investigation, *Decis. Support Syst.*, 56, 513–524, doi: 10.1016/j.dss.2012.11.008.

49. Chin, W. W., Marcolin, B. L., and Newsted, P. R. (2003), A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study., *Inf. Syst. Res.*, 14(2), 189–217, doi: 10.1287/isre.14.2.189.16018.

50. Hair, J. and Alamer, A. (2022), Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example, *Res. Methods Appl. Linguist.*, 1(3), 100027, doi: 10.1016/j.rmal.2022.100027.

51. Fornell, C. and Larcker, D. F. (1981), Evaluating Structural Equation Models with Unobservable Variables and Measurement Error, *J. Mark. Res.*, 18(1), 39–50, doi: 10.1177/002224378101800104.

52. Lee, C.-H. and Chen, C.-W. (2021), Impulse Buying Behaviors in Live Streaming Commerce Based on the Stimulus-Organism-Response Framework, *Information*, 12(6), 241, doi: 10.3390/info12060241.

53. Hu, M., and Chaudhry, S. S. (2020), Enhancing consumer engagement in e-commerce live streaming via relational bonds, *Internet Res.*, 30(3), 1019–1041, doi: 10.1108/INTR-03-2019-0082.

54. Zhang, X., Cheng, X. and Huang, X. (2023), Oh, My God, Buy It!' Investigating Impulse Buying Behavior in Live Streaming Commerce, *Int. J. Human–Computer Interact.*, 39(12), 2436–2449, doi: 10.1080/10447318.2022.2076773.

55. Chen, C.-C. and Yao, J.-Y. (2018), What drives impulse buying behaviors in a mobile auction? The perspective of the Stimulus-Organism-Response model, *Telemat. Inform.*, 35(5), 1249–1262, doi: 10.1016/j.tele.2018.02.007.

56. Koufaris, M. (2002), Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior, *Inf. Syst. Res.*, 13, 205–223, doi: 10.1287/isre.13.2.205.83.

## Appendix: List of questionnaire contents

| Variables | Measurement Items | Source |
|---|---|---|
| *Social presence of viewers* | | |
| SPV1 | I am aware of other viewers live stream who are interested with the products. | [43] |
| SPV2 | I am aware of other viewers live stream who share information regarding the product. | |
| SPV3 | I am aware of other viewers live stream who have purchased the product. | |
| *Social presence of live streamers* | | |
| SPL1 | I can make sense of the attitude of the streamers by interacting with them via live stream. | [43] |
| SPL2 | There is a sense of human touch when communicating with streamers via live stream. | |
| SPL3 | Communication with sellers via the streamer via the livestreaming is warm. | |
| *Social presence of livestreaming platform* | | |
| SPP1 | There is a sense of human contact in live streaming platform. | [42] |
| SPP2 | There is a sense of personalness in livestreaming platform. | |
| SPP3 | There is a sense of sociability in livestreaming platform. | |
| SPP4 | There is a sense of human warmth in livestreaming platform. | |
| SPP5 | There is a sense of human sensitivity in livestreaming platform. | |
| *Scarcity* | | |
| SC1 | I worried about limited time. | [55] |
| SC2 | I am concerned about limited quality. | |
| SC3 | I become anxious when I see a "sold out" sign. | |
| SC4 | I feel that the limited edition of a product will cause many people to buy. | |
| SC5 | I think that the current supply of a limited product is small. | |
| *Flow state* | | |
| FS1 | When watching e-commerce livestreaming, I did not want to take my eyes off the live. | [56] |
| FS2 | When watching e-commerce livestreaming, I overlooked what was going on around me. | |
| FS3 | When watching e-commerce livestreaming, I forgot what I had to do. | |
| FS4 | When watching e-commerce livestreaming, I found it enjoyable. | |
| FS5 | When watching e-commerce livestreaming, I found it interesting. | |
| FS6 | When watching e-commerce livestreaming, I found it fun. | |
| *Impulsive buying behaviors* | | |
| IB1 | When watching live streaming, I find it difficult to pass up a bargain. | [44] |

| | |
|---|---|
| IB2 | When watching live streaming, I am a bit reckless in buying products. |
| IB3 | When watching live streaming, I buy products displayed by live steamers spontaneously even though I do not need them. |
| IB4 | When watching live streaming, I sometimes can not suppress the feeling of desiring to buy products. |