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Sustainable consumption and impulse buying via livestreaming: The moderating role of price perception on urge to buy impulsively–A PLS-SEM analysis

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ABSTRACT

This study employs the stimulus-organism-response (SOR) model to examine the psychological and behavioral mechanisms driving impulse buying through livestreaming on e-commerce platforms, with a particular emphasis on sustainable consumption. It investigates the moderating role of price perception (PP) in the relationship between the urge to buy impulsively (UBI) and impulse buying behavior (IBB), aiming to understand how consumer awareness of pricing can influence more responsible purchasing decisions. Based on 366 valid responses from consumers aged 18 and above who had previously engaged in impulsive livestream purchases, data analysis using SPSS 30.0 and R reveals that susceptibility to social influence, impulse buying tendency, cognitive response (CR), and affective response (AR) significantly increase UBI. Perceived prospect indirectly affects UBI through its positive impact on CR and AR. UBI mediates the relationship between stimulus factors and IBB, underscoring its pivotal role in impulsive consumption. Crucially, PP negatively moderates the UBI-IBB link, suggesting that heightened price sensitivity may encourage more mindful and sustainable consumer behavior. These findings offer valuable insights for e-commerce platforms seeking to design livestreaming experiences that promote ethical consumption while balancing commercial objectives.

Keywords: sustainable consumption, impulse buying behavior, livestreaming on e-commerce, price perception, SOR theory, urge to buy impulsively

INTRODUCTION

The rapid development of communication technology and mobile devices has promoted livestream on e-commerce platforms to become a popular and dynamic shopping channel globally (Lo et al., 2022). The combination of real-time elements and the ability to directly interact between sellers and buyers provides consumers with an enjoyable shopping experience, thereby reducing the sense of risk and uncertainty in the purchase decision-making process (Feng et al., 2024). In addition to connecting sellers and consumers globally, livestream has created a significant change in consumers' shopping habits (Ma, 2021) and has become an ideal choice to exploit the "see now-buy now" motivation (Lo et al., 2022). Livestream continues to drive the strong growth of online shopping in Vietnam, expected to account for 20% of total e-commerce sales by early 2026, with Shopee (30.9%) and TikTok (17.2%) being the two most popular platforms (Anh, 2024). Every day in Vietnam, there are about 70-80 thousand livestream sales sessions, and consumers spend an average of 13 hours per week watching livestream (Anh, 2024). According to a survey of Vietnamese consumers conducted by Coc Coc (2024), 77% of them have watched livestream sales, of which 71% have made purchases via livestream, and 50% are ready to "add to cart" as soon as they see their favorite products. As livestream becomes more and more popular, competition in this industry has become fiercer (Zhang et al., 2021). Thousands of businesses are expanding their operations on platforms such as ShopeeLive, LazadaLive, and TikTokLive, with more than 50,000 participating sellers and an average of more than 2.5 million livestream sessions per month, providing customers with countless choices (Quỳnh, 2024). Therefore, to gain a competitive advantage, retailers need to have the right marketing strategy to promote impulse buying behavior (IBB) and enhance the consumer experience.

IBB, understood as unplanned purchasing decisions that arise from strong, spontaneous impulses without consideration (Liu et al., 2025), has become a topic that has attracted the attention of many researchers over the past 70 years. Currently, the stimulus-organism-response (SOR) model is commonly used in the analysis of consumers'

impulsive behavior on e-commerce platforms (Xue et al., 2024). Although the SOR model has been applied by many studies to analyze impulsive buying behavior, there are still gaps in exploring the psychological aspects in depth, such as how consumers process information (cognitive response [CR]) and emotions that arise during the shopping process (affective response [AR]). Most previous works have mainly exploited factors such as convenience, interactivity, entertainment, interface design factors, livestream atmosphere (Yang et al., 2022), or website platform characteristics (Sebastianelli & Tamimi, 2018), except for a few recent studies that have also mentioned these factors. For example, Lo et al. (2022) considered CR and AR in the livestream context; however, the causal relationship in the process of making impulse purchases has not been clarified. Similarly, the study by Abdelsalam et al. (2024) also applied the SOR model to the livestream process on e-commerce platforms, butplatforms butder the role of social influence as an important stimulus to impulsive HVMH. Additionally, the moderating role of price perception (PP) in the relationship between impulsive buying behavior (IBB) and impulse buying has been overlooked by many studies.

To address gaps in the existing literature on digital consumer behavior, this study develops a research framework for IBB in the context of livestreaming on e-commerce platforms, grounded in the SOR theoretical model. The study aims to clarify the moderating role of PP in the relationship between the urge to buy impulsively (UBI) and IBB, with a particular focus on promoting sustainable consumption. By examining how psychological and social stimuli influence impulsive purchasing decisions, the research contributes to understanding how digital retail environments can be designed to encourage more mindful and responsible consumer behavior. The structure of the study includes a comprehensive theoretical overview, hypothesis development, model construction, research methodology, data analysis, and a discussion of findings. It concludes with managerial implications for e-commerce retailers seeking to balance commercial effectiveness with sustainability goals, as well as limitations and directions for future research aimed at advancing responsible consumption in digital commerce.

While previous studies have frequently conflated the UBI with the act of impulse buying itself, this study explicitly distinguishes between the two constructs. The UBI represents the immediate psychological and emotional desire to purchase, whereas IBB refers to the actual execution of that purchase. This conceptual clarification helps fill a theoretical gap in SOR-based research on livestreaming commerce.

THEORETICAL BASIS AND RESEARCH HYPOTHESIS

Theoretical Basis

Concept of livestream on e-commerce platform

According to Hu et al. (2017), livestreaming on e-commerce platforms is a real-time video and audio broadcasting activity that allows broadcasters and viewers to interact through chat and comments. Livestreaming on e-commerce platforms has simulated the direct shopping experience and provided convenience for customers to shop right at home (Liu, 2023). Unlike the traditional online e-commerce model, this form allows sellers to directly introduce products, communicate with customers, and answer questions immediately, helping to bring a more authentic and interactive shopping experience and help buyers understand better, thereby reducing the sense of risk and uncertainty when making a purchase decision (Lu & Chen, 2021; Luo et al., 2024; Yang et al., 2022).

SOR model

The SOR model is a psychological framework used to explain how people respond to environmental stimuli. In the current context of e-commerce, the SOR model is increasingly applied by many studies to explore and explain consumers' spontaneous behavior (Feng et al., 2024; Huo et al., 2023; Lo et al., 2022; Xue et al., 2024). Accordingly, the structure of the SOR model consists of three main parts: stimuli from the external environment (S) affect internal psychological, emotional, and cognitive states (O), and lead to observable behavioral responses (R) (Mehrabian & Russell, 1974). The SOR model is considered a suitable theoretical tool for analyzing spontaneous consumer behavior through livestreaming, so the authors decided to apply the SOR model to clarify the relationships related to spontaneous consumer behavior. Specifically, external stimuli (S) including social susceptibility (SSI), scarcity perception (PS), impulse buying tendency (IBT), impact on CR, AR, and impulse buying impulse (UBI) are the subject (O), while consumers' spontaneous consumer behavior (IBB) is the response (R).

Research Hypothesis

Susceptible to social influence with impulse buying urges

Susceptibility to social influence (SSI) is understood as a person's ability to be persuaded by what others have experienced and to have a desire to gain their approval (Feng et al., 2024). According to Scheinbaum et al. (2020), the level of social influence may vary among individuals, as some individuals are more susceptible to the opinions of others when making purchase decisions. Individuals with high SSI tend to rely on others when purchasing products (Oyibo & Vassileva, 2019). Previous studies have shown a positive relationship between SSI and UBI (Polas et al., 2022; Sharma & Klein, 2020). This suggests that, in addition to the impact of personal emotions, UBI is also strongly motivated by social factors, such as buying according to trends. Therefore, the authors chose this factor for research and proposed the following hypothesis:

H1. SSI has a positive and direct effect on impulse buying.

Perception of scarcity with CR, emotional response, and impulse buying

Perceived scarcity is the consumer's feeling when a product is not enough to meet demand, and scarcity can be short-term (temporarily out of stock) or long-term (due to supply restrictions) (Gong & Jiang, 2023). According to Malhotra (2010), PS can evoke competitive psychology and create pressure to act quickly, with the desire to own the product before others. In the context of e-commerce livestream, when consumers perceive that a product is out of stock or only

available for a short time, they are likely to experience anxiety, excitement, and fear of missing out (Hamilton et al., 2019). Therefore, PS can increase consumers' AR (Gong & Jiang, 2023). The study by Wu et al. (2021) extended previous studies by suggesting that both temporal and quantitative scarcity increase the level of stimulation to AR. Eisend (2008) points out that scarcity can influence how consumers perceive and evaluate the value of a product, through both emotional and cognitive factors. In addition, PS also causes consumers to shift from planned evaluation to more emotional evaluation and increases UBI (Melati et al., 2024). Based on the above arguments, the authors propose the following hypotheses:

H2a. Perceived scarcity has a positive and direct effect on CR.

H2b. Perceived scarcity has a positive and direct effect on impulse buying.

H2c. Perceived scarcity has a positive and direct effect on AR.

Impulse shopping trends vs. impulse buying

Impulse buying is considered a personal trait that reflects the degree of susceptibility to unplanned impulse buying (Utama et al., 2021). Individuals with high impulsivity are more likely to engage in unplanned impulse buying (Bellini & Aiolfi, 2017). Previous studies have demonstrated a positive relationship between IBT and UBI (Aiolfi et al., 2022; Chen et al., 2021; Feng et al., 2024). Similarly, Cavazos-Arroyo and Máynez-Guaderrama (2022) showed that consumers with high IBT are more likely to make unplanned purchases. In addition, Aiolfi et al. (2022) concluded that the IBT factor has a positive and more prominent influence than other factors in promoting UBI. Therefore, the authors propose the following hypothesis:

H3. IBT has a positive and direct impact on impulse buying urge.

Cognitive and ARs to impulse buying

This study differentiates between affective impulse—an immediate emotional reaction such as excitement or enjoyment triggered during livestream viewing—and behavioral execution, which represents the observable act of making a purchase. Within the SOR framework, affective impulse corresponds to the "organism" (O) stage, while behavioral execution corresponds to the "response" (R) stage. By distinguishing these constructs, the model captures not only the emotional antecedents of impulsive buying but also the transition from psychological arousal to concrete behavior, providing a clearer understanding of the cognitive-emotional mechanisms that drive sustainable consumer decisions.

Gong and Jiang (2023) argue that CR is the degree to which a person likes or dislikes an object based on the attention to functional factors and the level of utility that the object provides. Positive CR can increase consumers' UBI toward a product or brand (Lo et al., 2022). Many studies also confirm a positive and statistically significant relationship between CR and UBI-driven purchases (Cui et al., 2022; Paul et al., 2022). In addition, ARs are emotions that consumers experience when interacting with the shopping environment, such as feelings of joy, excitement, or comfort (Gong & Jiang, 2023). When experiencing these positive emotions, consumers are often more likely to engage in impulse shopping on online platforms (Tang & Meng, 2022). Many studies have demonstrated that AR also plays an important role in stimulating UBI (Gong & Jiang, 2023; Lo et al., 2022). Similarly, Yang et al. (2022) determined that UBI is often strongly stimulated by consumers' AR. In addition, Feng et al. (2024) further reinforced the previous arguments on the role of affective and cognitive factors by demonstrating that CR and AR both have positive and statistically significant effects on consumers' UBI in the context of livestream. Based on the above arguments, the authors propose the following hypotheses:

H4a. Cognitive responsiveness has a positive effect on impulse buying.

H4b. AR has a positive effect on impulse buying.

Impulse buying and IBB

Impulse buying is a sudden feeling that arises in individuals, prompting them to buy immediately when they see a product on an e-commerce platform (Abdelsalam et al., 2024). Zhang et al. (2022) suggested that UBI is considered a predictor of impulsive buying behavior. This view is reinforced who found a strong correlation between UBI and IBB. In addition, Aiolfi et al. (2022) and Feng et al. (2024) also noted that consumers with high levels of impulse buying are more likely to engage in impulsive buying behavior in the context of livestreaming. From there, the authors propose the following hypothesis:

H5. Impulse buying urge positively affects IBB.

The mediating role of impulse buying

The impulse buying impulse is an important variable that drives impulsive HVMH (Utama et al., 2021), especially when stimulated by factors such as SSI, individual IBT (Feng et al., 2024), PS (Melati et al., 2024), and CR and AR (Feng et al., 2024). Specifically, SSI plays an important role in stimulating the urge to immediately purchase a product/service (Feng et al., 2024). People with high IBT often lack self-control and are easily influenced by emotions, thereby making them more likely to act impulsively (Goel et al., 2022; Zafar et al., 2021). In addition, PS can stimulate UBI by reducing the ability to process systematic information (Chung et al., 2017). In addition, Wu et al. (2020) found that CR was found to be closely linked to UBI. Regarding ARs, consumers will have an immediate purchase intention if they perceive online shopping as a more enjoyable experience (Feng et al., 2024). Therefore, the authors suggest that SSI, PS, IBT, CR, and AR have an indirect impact on IBB through UBI and propose the following hypotheses:

H6. Impulse buying urge plays a mediating role in the relationship between SSI and IBB.

H7. Impulse buying urge plays a mediating role in the relationship between IBT and IBB.

H8. Impulse buying urge plays a mediating role in the relationship between scarcity perceptions and IBB.

H9. Impulse buying urge plays a mediating role in the relationship between CR and IBB.

H10. Impulse buying urge plays a mediating role in the relationship between AR and IBB.

The moderating effect of PP

PP is defined as the consumer's perceived monetary value of a product/service, including the reasonableness, the balance between price and product performance, as well as the willingness to accept the offered price without searching for a lower price (Feng et al., 2024), demonstrated that price can convey a positive or negative signal, depending on the consumer's perspective; some individuals view high prices as a sign of quality, while others perceive them as a cost that is not worth the expense. Similarly, Sarkar and Khare (2017) emphasized that PP can play a role in promoting or weakening the impact on IBB. Meanwhile, Fenneman et al. (2022) found A moderate influence of PP on IBB. In particular, Feng et al.'s (2024) study found that the relationship between UBI and IBB may vary depending on individuals' perceptions of price. In addition, Cuong's (2024) findings suggested that perceived price is a negative moderator in the relationship between UBI and IBB among consumers. From the above findings, it can be seen that PP plays a role in moderating the relationship between UBI and IBB, either positively or negatively, by adjusting the strong and weak effects in this relationship. Therefore, the authors propose the following hypothesis:

H11. PP plays a moderating role in the relationship between impulse buying urge and IBB.

RESEARCH METHODS

Sampling and Data Collection Methods

Following the sampling guidelines outlined in Vu et al. (2025), this study adopted a convenience sampling method to optimize data collection efficiency while maintaining ethical and inclusive research standards. The survey was administered via Google Forms, with a balanced distribution: 50% online (through platforms such as Facebook and Zalo) and 50% in-person within Ho Chi Minh City. This hybrid approach ensured accessibility and diversity in respondent participation, supporting the principles of equitable and inclusive research under the sustainable development framework.

With 34 observed variables and a recommended ratio of 10:1, the minimum sample size was determined to be 340. To ensure robustness and account for potential data loss, the research team aimed to collect at least 380 responses, ultimately receiving 389 submissions. After a thorough screening process to uphold data integrity and quality, 29 invalid responses were excluded, resulting in 360 valid samples. This methodological approach reflects a commitment to transparent, responsible, and sustainable research practices, contributing to the broader goals of sustainable development in digital consumer behavior studies..

Research Methods

1. **Step 1:** Based on the theoretical foundation and previous studies, the authors developed a research model and formulated a hypothesis. Thereby, conducting qualitative research through interviewing a lecturer specializing in marketing and discussing with a group of 5 consumers who had made spontaneous purchases via livestream on an e-commerce platform to ensure the reasonableness of the variables in the scale and suitability to the practical context, before implementing preliminary quantitative research.
2. **Step 2:** The authors conducted a preliminary quantitative study with 50 respondents using an online survey via Google Form to assess the reliability of the scales. The questionnaire used a 5-point Likert scale to collect responses from survey participants. The data were then analyzed using SPSS 30.0 to assess reliability through the Cronbach's alpha coefficient. Variables with Cronbach's alpha > 0.6 and item-total correlation > 0.3 were retained for the official study (Hair et al., 2021).
3. **Step 3:** Based on the preliminary survey results, the authors proposed an official scale consisting of 8 factors: SSI, PS, IBT, CR, AR, UBI, IBB, and PP, corresponding to 34 observed variables (**Table 1**). The

Table 1. Official scale

Code	Content	Source
SSI		
SSI1	You often buy popular products that are well-known to many people when watching a livestream on e-commerce platforms.	Feng et al. (2024)
SSI2	You are often influenced by other people's thoughts and preferences when shopping on livestream.	
SSI3	You feel more connected to people who buy the same product or brand as you when watching a livestream on e-commerce platforms.	
SSI4	If you want to be like someone, you will often try to buy the same things they do.	
SSI5	During the livestream, you feel like you have something in common with people by buying the products and brands they also buy.	
PS		
PS1	When shopping on livestream, you are concerned about when the product will be out of stock.	Gong and Jiang (2023)
PS2	When shopping on livestream, you feel worried because of the limited time to shop.	
PS3	When shopping on livestream, you are concerned about the limited quantity of products.	
PS4	When shopping on livestream, you worry that the product you want to buy will quickly run out of stock.	
IBT		
IBT1	You often shop without a plan in advance when watching a livestream on e-commerce platforms.	Feng et al. (2024)
IBT2	You often shop without thinking much when watching a livestream on e-commerce platforms.	
IBT3	"Seeing is buying" is your shopping behavior when watching a livestream on e-commerce platforms.	
IBT4	"Buy first, think later" is your shopping behavior when watching a livestream on e-commerce platforms.	
IBT5	Sometimes, you want to buy immediately without thinking when watching a livestream on an e-commerce platform.	

Table 1 (Continued). Official scale

Code	Content	Source
CR		
CR1	Do you think the products introduced in the livestream on the e-commerce platform are right for your needs?	Gong and Jiang (2023)
CR2	Do you think the products introduced in the livestream on the e-commerce platform are valuable?	
CR3	Do you think the products introduced in the livestream on the e-commerce platform are suitable for you?	
AR		
AR1	I think the products introduced in the livestream are very attractive.	Gong and Jiang (2023)
AR2	I think the products introduced in the livestream are very interesting.	
AR3	I think the products introduced in the livestream are very attractive.	
AR4	Do you think that the products introduced in the livestream are easy to attract viewers and make them want to own them?	
UBI		
UBI1	You suddenly have the urge to shop while watching a livestream on an e-commerce platform.	Abdelsalam et al. (2024)
UBI2	You are more likely to be attracted to and buy products that are not on your shopping list when watching a livestream on e-commerce platforms.	
UBI3	You tend to want to buy something when watching a livestream on e-commerce platforms.	
UBI4	You feel like buying other items besides those that meet your specific shopping needs when watching a livestream on an e-commerce platform.	
IBB		
IBB1	When watching a livestream on e-commerce platforms, you cannot ignore the presence of cheap products.	Liu et al. (2025)
IBB2	When watching a livestream on e-commerce platforms, you often make hasty decisions about shopping.	
IBB3	When watching a livestream on e-commerce platforms, you often buy products on impulse, even though you don't need them.	
IBB4	When watching a livestream on e-commerce platforms, you can't help but feel the urge to buy the product.	
PP		
PP1	Livestream on an e-commerce platform offers the best price, meeting your needs.	Feng et al. (2024)
PP2	You don't want to spend extra time and effort looking for a lower price for the product.	
PP3	Do you think the shipping cost is commensurate with the quality of delivery?	
PP4	You think the discount price in the livestream on the e-commerce platform is very cheap.	
PP5	You find the product prices on the e-commerce platform's livestream to be reasonable.	

collected data were analyzed using the PLS-SEM method, including two steps: testing the measurement model and testing the structural model. The measurement model was evaluated through the reliability of the observed variables (outer loading), scale reliability (Cronbach's alpha and rhoC), convergence (AVE), and discrimination (HTMT). Then, the structural model was tested through the steps of assessing the level of multicollinearity (VIF), statistical significance, and the correlation between relationships in the model, as well as the coefficient of determination (R^2), the impact coefficient (f^2), and the role of moderator variables.

RESEARCH RESULTS

Descriptive Statistics

The survey sample consisted predominantly of females (74.4%) and individuals aged 25 to 35 years old (78.9%). Most respondents were involved in business (27.8%), with a small number identifying as students, teachers, or office staff. A significant majority reported high monthly incomes, with 70.6% earning over 30 million VND per month. In terms of shopping frequency, 64.2% made purchases 3-4 times a month. Tiki emerged as the most popular e-commerce platform (66.9%), followed by TikTok Shop (21.4%), while Shopee and Lazada had minimal usage. Overall, the data reflects a young, high-income, and digitally active consumer base with a strong preference for Tiki in **Table 2**.

Table 2. Descriptive statistics (n = 360)

		F (N)	P (%)
Sex	Male	92	25.6
	Female	268	74.4
Age	18 to under 25 years old	1	0.3
	25 to under 35 years old	284	78.9
	35 to under 45 years old	72	20.0
	Over 45 years old	3	0.8
Job	Students/fresh graduates	1	0.3
	Teacher/lecturer	1	0.3
	Office staff	12	3.3
	Business	100	27.8
Income	152,26-285,50 USD	1	0.3
	285,50-570,99 USD	2	0.6
	570,99-1.141,99 USD	15	4.2
	Over 1.141,991 USD	254	70.6
	Other	88	24.4
Frequency	1-2 times a month	111	30.8
	3-4 times a month	231	64.2
	5-10 times a month	17	4.7
	A lot/very often	1	0.3
E-commerce platforms	Shopee	2	0.6
	TikTok Shop	77	21.4
	Lazada	1	0.3
	Tiki	241	66.9

Note. F: Frequency & P: Percentage

Measurement Model Validation

The results of the first test, presented in **Table 3**, show that the external loading coefficients of the observed variables range from 0.406 to 0.908. Most of the scales have AVE values

Table 3. Results of reliability and convergent validity testing of the scales

OV	First time				Second time			
	ELF	CA	CR (rhoC)	AVE	ELF	CA	CR (rhoC)	AVE
SSI		0.756	0.794	0.452		0.732	0.808	0.522
SSI1	0.603				0.600			
SSI2	0.406							
SSI3	0.566				0.562			
SSI4	0.908				0.910			
SSI5	0.766				0.765			
PS		0.721	0.819	0.534		0.721	0.819	0.534
PS1	0.630				0.630			
PS2	0.725				0.725			
PS3	0.844				0.844			
PS4	0.707				0.707			
IBT		0.802	0.863	0.559		0.802	0.863	0.559
IBT1	0.798				0.798			
IBT2	0.706				0.706			
IBT3	0.742				0.742			
IBT4	0.759				0.759			
IBT5	0.729				0.729			
CR		0.729	0.847	0.650		0.729	0.847	0.650
CR1	0.813				0.813			
CR2	0.847				0.847			
CR3	0.755				0.755			
AR		0.735	0.835	0.559		0.735	0.835	0.559
AR1	0.786				0.786			
AR2	0.760				0.769			
AR3	0.768				0.768			
AR4	0.671				0.671			
UBI		0.722	0.827	0.546		0.722	0.827	0.546
UBI1	0.808				0.809			
UBI2	0.723				0.724			
UBI3	0.671				0.671			
UBI4	0.745				0.745			
IBB		0.719	0.825	0.542		0.719	0.825	0.542
IBB1	0.704				0.704			
IBB2	0.791				0.793			
IBB3	0.732				0.731			
IBB4	0.716				0.714			
PP		0.750	0.826	0.494		0.742	0.835	0.561
PP1	0.826				0.836			
PP2	0.730				0.735			
PP3	0.505							
PP4	0.635				0.613			
PP5	0.773				0.794			

Note. OV: Observation variable; ELF: External load factor; & CA: Cronbach's alpha

greater than 0.5, except for the SSI scale (0.452) and the PP scale (0.494).

Therefore, SSI2 and PP3, with the lowest external loading coefficients, will be eliminated for the second test. After the second test, the observed variables of the SSI, PS, IBT, CR, AR, UBI, IBB, and PP scales all have external loading coefficients ranging from 0.562-0.910. At the same time, the Cronbach's alpha and rhoC coefficients all exceed the threshold of 0.7, and the AVE values of the scales are all >0.5, indicating that the scales are reliable and ensure convergent validity (Hair et al., 2021).

Figure 1 shows the HTMT indices in the model.

The results from **Table 4** show that all HTMT indices in the model are below the threshold of 0.85 (Henseler et al., 2015),

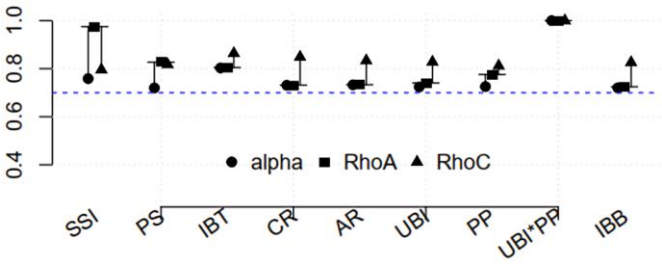

Figure 1. HTMT indices in the model (Source: Author's own elaboration, using R software)

confirming that the scales are clearly discriminative and eligible for further analysis.

Table 4. Discriminant value results–HTMT

	SSI	PS	IBT	CR	AR	UBI	PP	PP×UBI	IBB
SSI									
PS	0.112								
IBT	0.113	0.392							
CR	0.172	0.303	0.430						
AR	0.107	0.219	0.303	0.270					
UBI	0.185	0.163	0.338	0.373	0.427				
PP	0.115	0.223	0.239	0.334	0.260	0.402			
PP×UBI	0.089	0.184	0.137	0.232	0.302	0.384	0.396		
IBB	0.115	0.255	0.378	0.271	0.531	0.538	0.417	0.353	

Check the Structural Model

The results of using the bootstrapping method with 5,000 iterations recorded that the hypotheses **H1**, **H2a**, **H2c**, **H3**, **H4a**, **H4b**, **H5**, **H6**, **H7**, **H9**, **H10**, and **H11** were all statistically significant with a 95% confidence interval (**Table 5**).

However, hypotheses **H2b** and **H8** were rejected because the confidence interval contained the value 0 (Hair et al., 2021).

In addition to the hypothesis testing results, the model fit indices were examined to assess the overall adequacy of the PLS-SEM model. The standardized root mean square residual (SRMR) was 0.061, which is below the recommended threshold of 0.08, indicating an acceptable model fit (Henseler et al., 2015). The normed fit index (NFI) reached 0.921, exceeding the 0.90 cut-off, confirming a satisfactory fit between the conceptual and empirical models.

Regarding effect size, the f^2 values indicate that AR (AR → UBI, f^2 = 0.066) and UBI (UBI → IBB, f^2 = 0.073) exert small to moderate practical effects (Cohen, 2013). This suggests that while each factor contributes modestly, their cumulative effects play a meaningful role in explaining impulsive buying behavior within the livestreaming context.

Figure 2 presents the results of PLS-SEM analysis extracted from R software, describing the impact of the moderator variable (UBI*PP) directly on IBB, following the instructions from the book of Hair et al. (2021).

According to the research results, SSI has a small impact on UBI (f^2 = 0.022<0.15), similarly, PS also has a small impact on CR and AR with f^2 of 0.057 and 0.035 (<0.15), respectively and has no impact on UBI (f^2 = 0.000). Meanwhile, with f^2 = 0.016 (<0.02), IBT has an almost insignificant impact on UBI. CR has a small impact on UBI with f^2 = 0.026 (< 0.15). Notably, AR has f^2 = 0.066 for UBI, a more significant impact than the remaining variables, but still at a small level.

Finally, PP×UBI reflects a small impact on IBB with f^2 = 0.024 (< 0.15) (Cohen, 2013). In addition, based on the rule of Hair et al. (2021), the results show that the UBI and IBB variables have adjusted R^2 of 0.167 and 0.216, respectively, reflecting that the explanatory power of the independent variables for this behavior is quite limited but still within the acceptable threshold (**Figure 3**).

DISCUSSION

The analysis results accept hypothesis **H1** (β = 0.18), confirming that SSI has a positive effect on UBI. This finding contributes to supplementing and clarifying the limitations mentioned in the study of Abdelsalam et al. (2024) and is similar to the results of previous studies such as Oyibo and Vassileva (2019), Scheinbaum et al. (2020), Sharma and Klein (2020), Polas et al. (2022), Feng et al. (2024). When an individual tends to consult or agree with the social group in the decision-making process, they often have a higher level of UBI. This result is also consistent with the social influence theory in consumer psychology, which argues that individual behavior is strongly influenced by the views of others, especially in the context of livestream.

Hypotheses **H2a** and **H2c** were accepted, indicating that PS has a positive impact on CR (β = 0.323) and AR (β = 0.182), thereby further clarifying the role of psychological factors in promoting spontaneous HVMH. When a product is perceived as scarce, consumers' interest and emotional response tend to increase, thereby promoting spontaneous HVMH and vice versa. This result is consistent with the studies of Eisend (2008), Hamilton et al. (2019), Wu et al. (2021), and Gong and Jiang (2023). However, hypothesis **H2b** was rejected because the 95% confidence interval contained a value of 0, indicating that PS does not significantly affect UBI, which is different

Table 5. Results of testing research hypotheses

Hypothesis	Relationship	Beta	2.5% CI	97.5% CI	Result
Direct impact					
H1	SSI => UBI	0.138	0.022	0.252	Accept
H2a	PS => CR	0.232	0.136	0.340	Accept
H2b	PS => UBI	-0.006	-0.118	0.105	Reject
H2c	PS => AR	0.183	0.073	0.299	Accept
H3	IBT => UBI	0.131	0.014	0.256	Accept
H4a	CR => UBI	0.160	0.018	0.286	Accept
H4b	AR => UBI	0.245	0.131	0.363	Accept
H5	UBI => IBB	0.297	0.180	0.412	Accept
Total intermediary relationship					
H6	SSI => UBI => IBB	0.041	0.006	0.084	Accept
H7	IBT => UBI => IBB	0.039	0.004	0.086	Accept
H8	PS => UBI => IBB	0.022	-0.010	0.061	Reject
H9	CR => UBI => IBB	0.047	0.005	0.096	Accept
H10	AR => UBI => IBB	0.073	0.030	0.127	Accept
Regulatory relationship					
H11	PP x UBI => IBB	-0.112	-0.194	-0.021	Accept

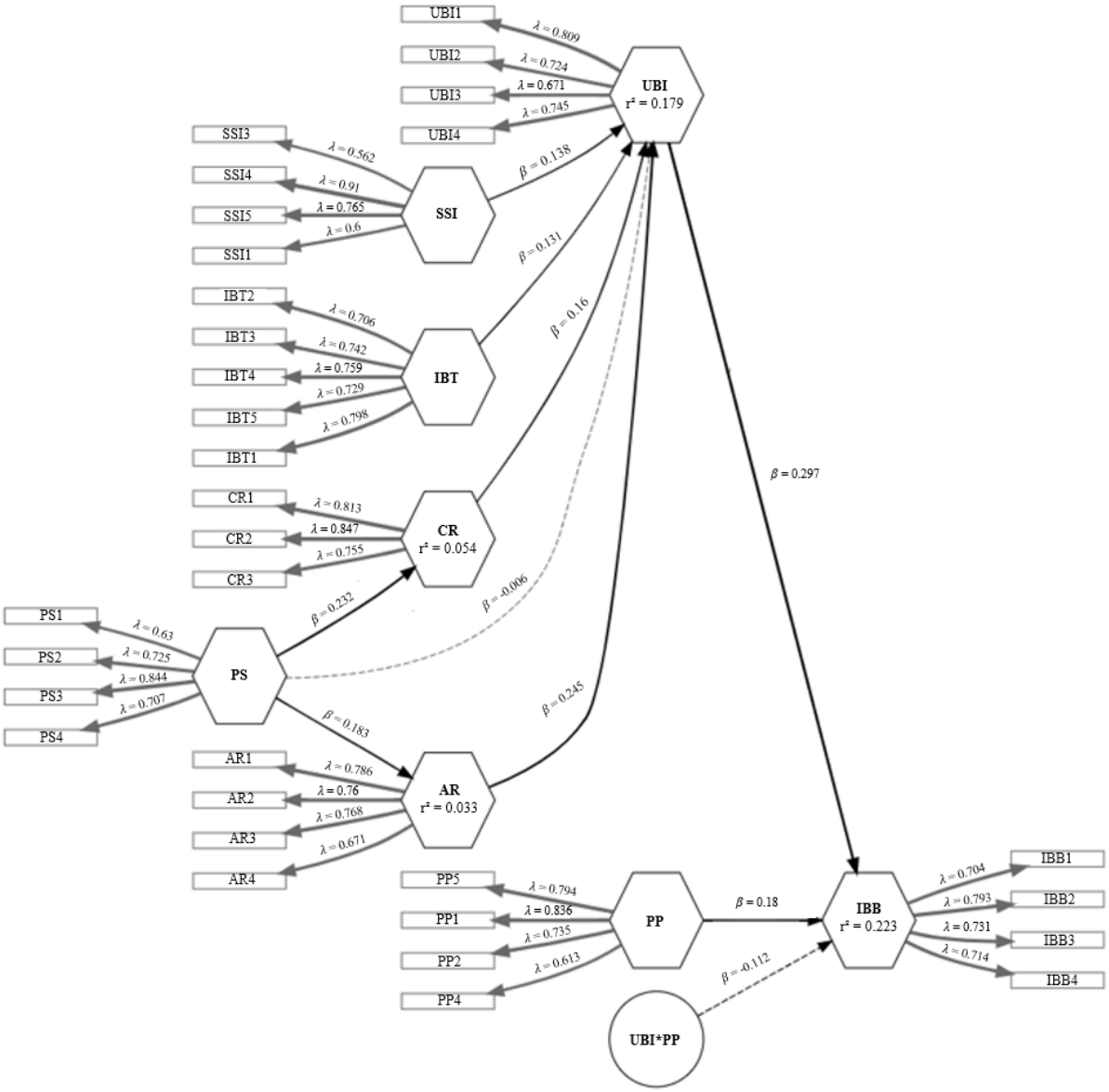

Figure 2. Results after PLS-SEM analysis (Source: Author's own elaboration, using R software)

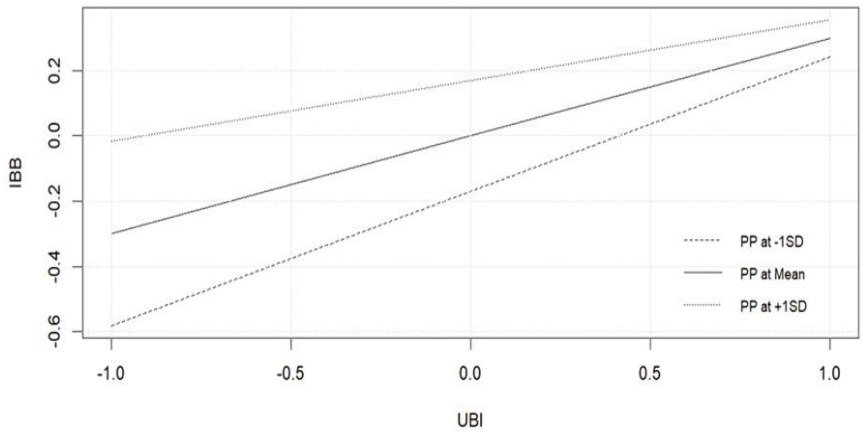

Figure 3. Regulatory impact of PP on UBI-IBB (Source: Author's own elaboration, using R software)

from the studies of Gong and Jiang (2023) and Melati et al. (2024).

H3 was accepted with β = 0.131, confirming that IBT positively and directly affects UBI. This result is consistent with the studies of Bellini and Aiolfi (2017), Chen et al. (2021), Aiolfi et al. (2022), Cavazos-Arroyo and Máynez-Guaderrama (2022), Feng et al. (2024) emphasizing that people with high IBT are more susceptible to interactive livestream sessions, which create a sense of urgency and stimulate UBI.

Both hypotheses, **H4a** and **H4b**, were accepted, indicating that CR and AR have a positive and direct effect on UBI with β coefficients of 0.160 and 0.245, respectively. This result is consistent with the studies of Wu et al. (2021), Lo et al. (2022), Cui et al. (2022), Paul et al. (2022), and Feng et al. (2024). When livestream provides attractive and accurate information, it will increase consumers' desire to make impulse purchases. Similarly, the result is also consistent with the studies of Tang and Meng (2022), Lo et al. (2022), Zhang et al. (2022), Gong and Jiang (2023), and Feng et al. (2024) on consumer psychology. If the livestream is engaging, enthusiastic, creative, and inspiring, it can evoke positive emotions, increasing consumers' UBI.

Accepting hypothesis **H5** demonstrates that UBI has a positive effect on IBB with a β coefficient of 0.297. When customers feel a strong urge, the likelihood of performing unplanned HVMH during livestream sessions increases. This finding is consistent with the studies of Abdelsalam et al. (2024), Zhang et al. (2022), Cavazos-Arroyo and Máynez-Guaderrama (2022), Aiolfi et al. (2022), and Feng et al. (2024).

Hypotheses **H6**, **H7**, **H9**, and **H10** were all accepted, indicating that UBI plays a full mediating role in the indirect relationship between SSI, IBT, CR, AR, and IBB with β coefficients of 0.041, 0.039, 0.022, and 0.073, respectively. This result further supports previous studies by Chung et al. (2017), Wu et al. (2020), Goel et al. (2022), Zafar et al. (2021), and Feng et al. (2024) elucidate the important role of UBI in transforming psychological and stimulus factors such as SSI, PS, CR, and AR into actual purchase decisions. In particular, hypothesis **H8** was rejected because the 95% confidence interval contained the value 0, indicating that PS does not indirectly affect IBB, which is different from the studies of Gong and Jiang (2023) and Melati et al. (2024).

The rejection of **H2b** and **H8** may be attributed to the unique characteristics of Vietnamese consumers in livestreaming contexts. Unlike consumers in scarcity-sensitive markets, Vietnamese buyers might perceive scarcity cues in livestreams as a marketing tactic rather than a genuine limitation, thereby weakening the emotional and behavioral response to perceived scarcity. Additionally, the dominance of entertainment-driven motivations in livestream viewing may dilute the direct and mediated effects of scarcity on impulse buying.

Finally, hypothesis **H11** was accepted with a coefficient of β = -0.112, indicating that PP has a negative moderating role in the relationship between IBB and UBI. Specifically, when consumers pay attention to price, they will control their immediate shopping desire, thereby limiting unplanned purchasing decisions, especially during livestream sessions. This finding adds to the understanding of the moderating role of PP on impulsive HVMH, consistent with the study of Cuong (2024), however, the research results are contrary to the study of Feng et al. (2024) when they argued that PP has a positive moderating role.

CONCLUSION AND IMPLICATIONS

Conclusion

This study advances the SOR framework by disentangling psychological impulse (UBI) from behavioral outcomes (IBB), introducing PP as a novel moderating factor linked to sustainable consumption. From a scientific perspective, this study contributes to advancing the understanding of how external environmental factors—such as SSI and IBT—affect internal psychological responses, including CR, AR, and the UBI, ultimately leading to spontaneous consumer behavior. Notably, perceived prospect (PS) does not directly influence UBI but indirectly affects IBB, while PP plays a negative moderating role in the UBI-IBB relationship. These findings extend the SOR model by incorporating sustainability-relevant variables, offering a deeper understanding of impulsive consumption in the context of livestreaming on e-commerce platforms.

Practically, the study provides empirical evidence from Vietnam, enriching the theoretical foundation and offering valuable references for future research in emerging markets. It also delivers actionable insights for e-commerce retailers seeking to foster responsible consumption. By understanding the psychological and environmental drivers of impulsive behavior, retailers can design marketing strategies and livestreaming experiences that not only enhance consumer engagement but also promote ethical and sustainable purchasing decisions, in line with the goals of sustainable development goal 12: responsible consumption and production.

Management Implications

Firstly, the AR variable has the highest impact on UBI with β = 0.245. Therefore, retailers should focus on creating entertaining, inspirational or humorous livestream content that is suitable for the characteristics of the target customer group, in order to evoke positive emotions, thereby stimulating the urge and leading to spontaneous HVMH of consumers. In addition, retailers need to focus on vivid visual effects, engaging music, professional lighting, as well as telling brand stories or sharing real experiences from users, in order to create closeness and emotional connection between viewers and livestream hosts, thereby facilitating spontaneous purchasing behavior.

Second, the CR variable has a significant impact on UBI with β = 0.160. Retailers should focus on providing complete product information in an intuitive and easy-to-understand manner throughout the livestream session. Elements such as detailed descriptions, before and after product comparisons, analysis of product uses or practical benefits will help consumers appreciate the usefulness, thereby increasing the urge to buy. Providing clear, accurate information and promptly responding to viewers' questions will contribute to raising positive awareness of the product.

Third, the SSI variable affects UBI with β = 0.138. Retailers should focus on increasing trust and strengthening social presence in livestreams by choosing best-selling or highly rated products to introduce in livestreams. At the same time, the host should emphasize the number of orders sold, positive

feedback from customers, and exploit the crowd effect to stimulate consumers' impulsive buying behavior in livestreams. In addition, retailers can consider collaborating with reputable influencers who match the image that viewers want to aim for to share real-life experiences, thereby helping to strengthen trust and stimulate their impulsive HVMH.

Fourth, IBT affects UBI with β = 0.131. To effectively exploit this factor in livestream, retailers need to present products in a visual, vivid way and increase interaction between the host and viewers. In addition, the host should introduce the product in a flexible and vivid way, such as close-up, direct experience, or emphasize the aesthetics and utility of the product, helping viewers easily visualize the product when used in reality. When combining product images with attractive narration, it will create intimacy, stimulate the urge, and evoke spontaneous HVMH of viewers.

Fifth, the study found that PS was statistically significant for CR (β = 0.232) and AR (β = 0.183). Retailers should create a sense of product scarcity during livestream by clearly announcing limited product quantities, short-term promotions, or promotions that are only available during livestream sessions to stimulate consumers' CR and AR, thereby accelerating their purchase decisions so as not to miss out on opportunities.

Sixth, UBI directly affects IBB (β = 0.297), while acknowledging the mediating role of UBI between psychological factors and spontaneous HVMH opens up a new approach for retailers in designing strategies during their livestream. In this context, UBI is a powerful emotional factor that motivates viewers to feel attracted and have the desire to buy immediately, even if they had no intention before. To exploit it effectively, retailers need to maintain a vibrant atmosphere, create new content and unexpected highlights with interwoven entertainment elements, to retain viewers longer, thereby arousing spontaneous HVMH.

Finally, PP has a negative moderating role in the relationship between IBB and UBI (β = -0.112). When consumers are well aware of prices, they will become more cautious and tend to carefully consider the value received and the price paid, helping them better control their impulse to shop, thereby reducing impulsive HVMH. Therefore, retailers need to build a reasonable and transparent pricing strategy and provide exclusive offers with product quality commitments as well as clear information to further strengthen trust and help consumers feel more secure, contributing to increasing the urge and promoting impulsive HVMH of consumers in livestream.

Sustainability Implications

The findings reinforce the connection between impulsive online consumption and sustainable behavior by emphasizing the moderating role of PP. When consumers become more price-conscious and aware of value trade-offs, they tend to exhibit behaviors aligned with sustainable development goal 12 (responsible consumption and production). This aligns with the concept of green consumer behavior, where purchase decisions integrate emotional satisfaction with ethical and environmental considerations (White et al., 2019).

Encouraging transparency in pricing, promoting durable and eco-friendly products during livestreams, and using educational cues that highlight sustainable choices can transform impulsive tendencies into conscious consumption patterns. Hence, livestream commerce platforms can act not only as sales drivers but also as behavioral nudges toward responsible and sustainable digital retail ecosystems.

Limitations and Future Research Directions

Firstly, this study is limited to consumers in Ho Chi Minh City. However, differences in culture, economy, technology access, and consumption habits between regions may affect IBB through livestream on e-commerce platforms. Therefore, future studies should expand the scope of the survey to other provinces or Vietnam to assess the differences between regions and have a more comprehensive perspective.

Second, the current study did not analyze each specific category in depth, while IBB can vary significantly depending on the product type. The research data shows that fashion (38.8%), health & beauty (27.4%), and home & living (14.8%) are the categories with high rates of impulse buying, which is completely consistent with Metric VN's (2024) report on the leading items in e-commerce sales. Therefore, future research should delve into each specific category to understand consumers' IBB.

Third, in order to simplify the model, the current study did not analyze the direct relationship between PP and UBI and IBB. In addition, factors such as discount level or promotion programs may play a moderating role in the impulsive purchase decision-making process (Feng et al., 2024). Therefore, future research can integrate these factors into building a more comprehensive model.

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