







“From scarcity to purchase: psychological mechanisms influencing Gen z impulsive buying”

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FROM SCARCITY TO PURCHASE: PSYCHOLOGICAL MECHANISMS INFLUENCING GEN Z IMPULSIVE BUYING

Abstract

In the digital economy, scarcity marketing has emerged as a powerful strategy that strongly shapes consumer decisions, particularly among Generation Z. However, while widely adopted, the psychological mechanisms through which scarcity influences impulsive buying remain insufficiently clarified, especially in emerging markets. This study aims to examine how scarcity-based marketing affects impulsive purchase behavior through psychological drivers, and to explore the moderating role of self-control. A mixed-method approach was employed. The qualitative stage included focus group discussions and expert interviews to validate constructs and refine measurement items. The quantitative stage involved an online survey conducted in January 2025 with 420 Gen Z consumers in Vietnam, analyzed using structural equation modeling (PLS-SEM) and descriptive statistics. The findings indicate that product scarcity activates important psychological responses such as competitive arousal and fear of missing out (FOMO), which subsequently encourage herding tendencies and lead to impulsive purchases. Self-control moderates these relationships by weakening the influence of competitive arousal while enhancing the impact of herding behavior. This study concludes that scarcity marketing influences Gen Z's impulsive buying primarily through social and psychological pathways. The results extend the Stimulus-Organism-Response (S-O-R) framework by highlighting both direct and moderated effects of consumer psychology in a scarcity context. From a managerial perspective, the findings offer practical implications for designing scarcity-driven campaigns more responsibly, balancing short-term effectiveness with the need to foster sustainable and ethical consumer engagement.

Keywords

scarcity, impulse buying, FOMO, herding, self-control, Gen Z

JEL Classification

M31, D91, L81

INTRODUCTION

In today's highly competitive commercial environment, businesses are constantly adopting innovative strategies to attract consumer attention and stimulate unplanned purchases. Among these, scarcity marketing has become one of the most prominent approaches, leveraging limited availability or time pressure to trigger rapid purchase decisions. Prior studies have shown that scarcity is a powerful stimulus for impulsive buying, making it an important area of inquiry within marketing and consumer behavior research (Barton et al., 2022).

In Vietnam, scarcity tactics are particularly evident during large-scale promotional events such as "double-digit days" or Lunar New Year campaigns, where retailers report sharp increases in revenue. For instance, the fashion brand Torano recorded a threefold rise in sales during the November 11 and December 12 shopping festivals in 2023. These outcomes illustrate the pervasive impact of scarcity

on consumer spending patterns. Notably, Generation Z consumers are especially prone to such influences due to their constant exposure to digital environments and susceptibility to peer and social media trends (Liu et al., 2021; Djafarova & Bowes, 2021).

Despite its effectiveness, impulsive buying driven by scarcity raises critical concerns. On the consumer side, it may lead to overspending, financial strain, and erosion of trust in businesses, while at the societal level, it contradicts the growing emphasis on sustainable consumption. The scientific problem, therefore, lies in understanding the psychological mechanisms through which scarcity exerts its influence on consumer decision-making, particularly among Gen Z. Although previous studies have identified factors such as fear of missing out (FOMO) and herding behavior as important drivers, existing research remains limited in scope. Furthermore, the potential moderating influence of self-control, a trait that may either suppress or amplify the impact of these psychological factors, has not been sufficiently examined in the context of scarcity marketing.

Furthermore, the potential moderating influence of self-control, a trait that may either suppress or amplify the impact of these psychological factors, has not been sufficiently examined in the context of scarcity marketing. To deepen this understanding, it is essential to review the existing body of literature that has examined scarcity marketing and its psychological consequences.

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Literature review investigates the definitions of product scarcity, competitive arousal, fear of missing out (FOMO), herding behavior and impulsive purchase. From there, highlights the influence of product scarcity on impulsive purchase through these psychological factors. Besides, Commodity Theory and Stimulus-Organism-Response (S-O-R) theoretical model are also applied in this study.

Firstly, the Commodity Theory suggests that the value of a product can increase or decrease depending on how easy or difficult it is to access it. In particular, it is possible to increase the value of any product in the eyes of consumers by reducing their access to that product, which will make them fear missing out on the opportunity to own it (Wu et al., 2012; Wulandjani et al., 2023; Tang et al., 2025). In contrast, with mass products that are easily accessible and purchased, customers will tend to assume that the product is always available when needed and that there is no need to take the opportunity to own it.

In the commercial context, the S-O-R theoretical model is widely applied to explain consumer behavior, including purchase intention, shopping

behavior, and loyalty (Zhu et al., 2020). This theoretical model was developed by Mehrabian and Russell (1974); the authors argued that “different elements of the environment act as stimulus (S), influencing the individual’s internal state, functioning as the organism (O), which in turn leads to behavioral responses (R).” In this theoretical model, environmental stimuli act as independent variables and antecedents, organisms are considered as consequences of environmental stimuli and predictors of final responses, and responses are outputs, referring to the consequences of stimuli and organisms related to human intentions and actual behaviors. Many authors have applied the S-O-R model as a theoretical basis for their research. In particular, Islam et al. (2021) and Zhang et al. (2022) used this model to clarify the relationship between product scarcity and consumers’ impulsive buying behavior. The authors have referred to and inherited the theoretical basis from previous related studies as a basis for this research.

Scarcity is considered a phenomenon that occurs when the ability to obtain a product decreases due to its limited availability (Wulandjani et al., 2023). The research by Ladeira et al. (2023) mentions that product scarcity reflects the extent to which products become scarce (i.e., a sense of insufficiency, often indicating the limitation of available resources compared to human needs and wants, which are infinite). When shopping in the same space or

time, customers may have a strong sense of competition, which is likely to influence their decision-making process. In simple terms, scarcity heightens customers' sense of competition in acquiring the product, creating an urgency to buy and own it (Kaur & Malik, 2020).

When shopping in the same space or time, customers may have a strong sense of competition, which is likely to influence their decision-making process. The research by Song et al. (2021) suggests that competitive arousal (COMP) is "the process of actively competing with others to own similar consumer products." In marketing and commerce, competitive arousal occurs when customers feel pressured and forced to compete to obtain the desired product (Goetha, Niha & Fallo, 2024). This psychological factor is often reinforced by scarcity messages, exclusive discounts, limited quantities, or limited-time offers, which make consumers perceive the need to act quickly (Kim & Jang, 2021). Because even a slight delay could mean that the offer (e.g., discount, limited-time promotion) will expire or be taken by someone else, which is why they feel the need to act quickly (Coskun et al., 2020). As a result, it can be observed that product scarcity not only creates a sense of urgency but also triggers a strong feeling of competitive arousal in the psychology of customers (Broeder & Wentink, 2022; Serravalle et al., 2023; Wu et al., 2021).

On the other hand, reduced product availability can enhance the value of the commodity because consumers fear missing the opportunity to own it (Wulandjani et al., 2023). Hence, it can trigger impulsive purchasing behavior easily (Arafat et al., 2021). FOMO psychological syndrome shows anxiety, obsession, and jealousy when feeling that they are missing out on an opportunity or an enjoyable experience or not participating in something that others are doing (Tanhan et al., 2022). FOMO is considered an important part of consumer behavior analysis, as this psychological effect makes people want to participate in events that are happening in society (Chiu et al., 2025). When owning scarce products, FOMO individuals will feel more different from others, and this can make them feel proud or even jealous of themselves (Cengiz & Şenelk, 2023).

Understanding this psychology, businesses often apply product scarcity marketing strategies to trigger the feeling of FOMO from customers. Thereby, businesses can encourage consumers to shop more, minimize the possibility of missing out on the lowest level, and increase sales for the company. The direct impact relationship between scarcity and FOMO has been demonstrated in previous studies, such as the studies of Zhang et al. (2021, 2022). For instance, when the number of tickets or seats at a popular event is announced to be running out, this can create a feeling of FOMO in those who do not have tickets or have not registered, making them feel that they have missed out on an important opportunity, thereby motivating them to act quickly to buy tickets, so scarcity signals have been proved to affect FOMO (Zhang et al., 2021; Zhang et al., 2022).

Customers with FOMO syndrome tend to be easily motivated by the pressure to imitate the crowd's behavior, causing them to act accordingly (Morsi et al., 2025; Hao & Huang, 2025). This imitation action is called herding behavior (HB). Herding behavior refers to a situation where some individuals make decisions based on the actions of the majority without careful consideration and in-depth analysis (Gupta & Shrivastava, 2022). In particular, in the context of global technology like today, Generation Z has the opportunity to be exposed to social networks very often, thereby encouraging the tendency to follow the decisions of the majority (Tlili et al., 2023). Many studies have identified that FOMO is related to human herding behavior (Fitri et al., 2024), as both psychological factors stem from a desire not to be left behind, especially in the financial and stock fields. FOMO can influence individual financial decisions, leading to herding behavior in certain markets (Gupta & Shrivastava, 2021). In the field of marketing, factors such as online reviews, queue behaviors, or limited-edition products are often used to trigger herd behavior. However, this effect also carries risks, as customers may frequently overlook their true needs or the product quality and make decisions based solely on the crowd. In the context of this study, the authors hypothesize that the phenomenon of FOMO for scarce products can make consumers susceptible to herding behavior and influenced by the majority opinion.

Under the psychological impact of the marketing trick of product scarcity, consumers are prone to impulsive shopping behavior. Impulsive purchase (IP) is understood as the tendency of consumers to buy goods and services without prior planning; the purchase decision is quickly pushed, and the desire to own is emotional. This consumer behavior is sudden and characterized by an immediate urge. In the context of scarce product marketing, many people want to buy the product, but the quantity and time required for the promotion are limited. This has created competitive arousal in the customer's psychology and leads to immediate shopping behavior without thinking carefully because they do not want to miss the opportunity or fall behind (Broeder & Wentink, 2022). In another research, Wu et al (2021) stated similarly that when consumers are uncertain about whether they can successfully purchase a limited-time promotional product, it stimulates them to complete the transaction to satisfy the feeling of winning in the competition and to enjoy a satisfying experience. In addition to competitive arousal, herding behavior also plays an important role in influencing impulse buying. Herding behavior is a precursor to purchasing decisions (Chen et al., 2020; Cho et al., 2021; Ali & Amir, 2024). Under scarcity marketing, consumers are motivated by limited-time offers or product quantities, causing them to act in line with the majority. The pressure from herding behavior directly affects consumer purchasing (Minh et al., 2023).

Besides, one of the notable points of this study is to assess consumers' self-control ability in the context of shopping under the pressure of scarcity marketing. Self-control (SC) is defined as the ability to regulate emotions, psychology, thoughts, and behaviors according to long-term goals, especially when faced with short-term attractive choices (Duckworth et al., 2019). People with self-control typically conduct careful cost-benefit analysis and comparisons, along with a self-awareness of needs and wants (Sun et al., 2025). This is an important factor affecting shopping behavior, especially in controlling impulsive purchases (Nagar, 2016). The authors evaluate self-control as a moderating variable in this research model. When self-control is overridden by competitive arousal or the satisfaction derived from competing with others to achieve certain goals, consumers often find it difficult to resist engaging in impulsive purchase behavior (Li

et al., 2020). Therefore, this variable plays a moderating role in the relationship between competitive arousal and impulsive purchase behavior. Besides, self-control also moderates the relationship between herding behavior and impulsive shopping in consumers. Self-control acts as a critical factor enabling individuals to maintain their stance and resist being swayed by the herding effect. Consumers exhibiting a high degree of self-control possess the ability to regulate their emotions and make rational decisions. In conclusion, the role of self-control is pivotal in regulating purchasing behavior, particularly in contexts involving competitive arousal and the influence of the herding behavior.

In this study, the specific objective is to investigate the impact of scarcity product communication strategy on customers' impulsive buying behavior through the mediating psychological factors of competitive arousal, FOMO, and herding behavior. At the same time, the study also examines the moderating role of self-control in the relationship between competitive arousal and herding behavior on impulsive buying. The research hypotheses are built on the review of references and previous relevant empirical evidence:

- H1: Product scarcity has a positive impact on competitive arousal.*
- H2: Product scarcity has a positive impact on fear of missing out.*
- H3: Fear of missing out has a positive impact on herding behavior.*
- H4: Competitive arousal has a positive impact on impulsive purchases.*
- H5: Herding behavior has a positive impact on impulsive purchases.*
- H6: Self-control mediates the relationship between competitive arousal and impulsive purchase.*
- H7: Self-control mediates the relationship between herding behavior and impulsive purchase.*

The research model is illustrated in Figure 1.

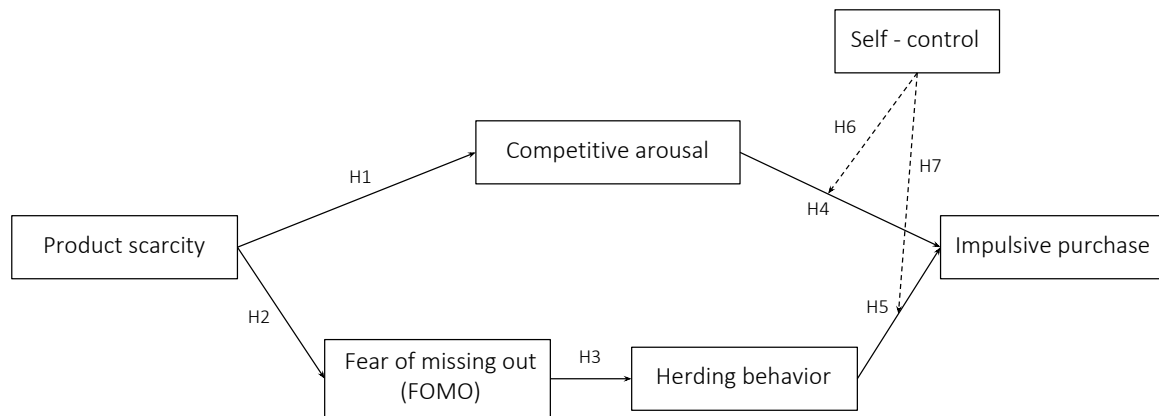


Figure 1. Proposed research model

2. METHODOLOGY

2.1. Participants and data collection

This study employed a mixed-method design, combining qualitative exploration and quantitative validation. In the first stage, qualitative research was conducted through focus group discussions and expert interviews with 13 Vietnamese participants, including ten Gen Z consumers aged 16-27 with shopping experience, two marketing specialists, and one academic with expertise in scarcity marketing. Participants were recruited voluntarily through the research team’s professional and social networks. Their responses helped refine constructs, confirm the relevance of variables, and adapt the wording of items to ensure clarity and suitability for Generation Z in the Vietnamese context.

In the second stage, a quantitative survey was administered using an online questionnaire via Google Forms, distributed through social media platforms in January 2025. A non-probability sampling method was employed to reach Gen Z consumers in Vietnam. The questionnaire consisted of three parts: an introduction, measurement items for each construct, and demographic information. In total, 420 valid responses were collected and analyzed. According to Hair et al. (2014), this sample size exceeds the minimum requirement for PLS-SEM analysis. Data were processed using SmartPLS 4 for structural equation modeling and SPSS for descriptive statistics.

2.2. Ethical considerations

All participants took part voluntarily and provided informed consent before participation. Anonymity and confidentiality of responses were guaranteed. Participants were informed that the data would be used strictly for academic purposes.

2.3. Measurements

Measurement items were adapted from prior validated scales. Product scarcity (4 items) and competitive arousal (3 items) were adapted from Serravalle et al. (2023). FOMO (4 items) was measured following Zhang et al. (2022), herding behavior (4 items) from Su et al. (2023), self-control (3 items) from Chen et al. (2022), and impulsive purchase (3 items) from Zhang et al. (2022). In total, 21 items were employed, all measured on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). A full version of the questionnaire is provided in Appendix A.

2.4. Demographic results

According to Table 1, the statistical results show that the % of female survey participants is 66%. In comparison, the number of male survey participants is only 34%, showing that the number of survey participants is skewed towards women. When talking about age, the group the age of 19-21 years old accounts for the most significant proportion with 59%, the group with the second largest proportion is the group with the age of 22-24 years old with 18%, while the youngest age group from

Table 1. Demographic results

	Classification	Frequency	Percentage
Gender	Female	279	66%
	Male	141	34%
Age	From 16 to 18 years old	43	12%
	From 19 to 21 years old	254	59%
	From 22 to 24 years old	75	18%
	From 25 to 27 years old	48	11%
Academic level	High school	43	10%
	College	33	8%
	University	221	53%
	Postgraduate	123	29%
Income	Less than 3,000,000 VND	90	21%
	3,000,000 to 6,000,000 VND	181	43%
	6,000,000 to 9,000,000 VND	79	19%
	Over 9,000,000 VND	70	17%

16-18 years old accounts for 12% and the oldest age group from 25-27 years old accounts for only 11%. This result shows that most of the survey focuses on the early stages of adulthood, which is the age group with the highest demand for new or scarce products. Regarding education level, the number of participants with university degrees accounts for the highest proportion at 53%; those with postgraduate degrees account for 29%; those with high school degrees account for 10%; and finally, the group with college degrees with 8%. Most of the survey participants have a high level of education or have completed a university program. In terms of monthly income, the survey

sample is distributed quite evenly among the groups, but there is a high concentration in the group with income from 3,000,000 to 6,000,000 VND with 43%. This is explained by the fact that most survey participants are students or new employees, so their income is low to medium.

3. RESULTS AND DISCUSSION

The results from Table 2 show that all the external loading factors of the observed variables in the model are greater than 0.7, thereby confirming that these observed variables have good meaning

Table 2. Reliability and validity

Variable		Outer loading	CR	AVE	Cronbach's Alpha
Product scarcity (PS)	PS1	0.795	0.871	0.628	0.802
	PS2	0.779			
	PS3	0.778			
	PS4	0.817			
Competitive arousal (COMP)	COMP1	0.837	0.873	0.695	0.782
	COMP2	0.828			
	COMP3	0.836			
Fear of missing out (FOMO)	FOMO1	0.766	0.883	0.653	0.822
	FOMO2	0.838			
	FOMO3	0.808			
	FOMO4	0.818			
Herding behavior (HB)	HB1	0.853	0.882	0.652	0.822
	HB2	0.766			
	HB3	0.81			
	HB4	0.799			
Impulsive purchase (IP)	IP1	0.857	0.885	0.72	0.806
	IP2	0.833			
	IP3	0.855			
Self-control (SC)	SC1	0.848	0.836	0.63	0.706
	SC2	0.76			
	SC3	0.77			

Table 3. Heterotrait-monotrait (HTMT) ratios for discriminant validity

Variable	COMP	FOMO	HB	IP	PS	SC	COMP * SC	HB * SC
COMP	–	–	–	–	–	–	–	–
FOMO	0.473	–	–	–	–	–	–	–
HB	0.504	0.721	–	–	–	–	–	–
IP	0.492	0.744	0.791	–	–	–	–	–
PS	0.532	0.827	0.813	0.706	–	–	–	–
SC	0.505	0.451	0.384	0.446	0.466	–	–	–
COMP * SC	0.285	0.288	0.297	0.379	0.317	0.564	–	–
HB * SC	0.316	0.234	0.262	0.189	0.282	0.572	0.572	–

and that no variables are removed from the model. For the Composite Reliability and Cronbach’s Alpha coefficients, all variables have values greater than 0.7 and less than 0.9, showing that the variables ensure high reliability and homogeneity, and the questions in the scale show a close connection, measuring the same concept. The AVE value is greater than 0.5, showing the scale has good convergence.

According to the evaluation threshold of Henseler et al. (2015), the HTMT index must be less than 0.9 to ensure discrimination. The data analysis results show that all pairs of latent variables have HTMT values less than 0.85, thereby reflecting good discrimination of the variables in the model, and the model does not need to be adjusted (see Table 3).

According to Table 4, all VIF results of the variables are less than 3, proving that no multicollinearity phenomenon exists. Thus, the measurement coefficients between the variables will not be distorted due to the influence of multicollinearity, and no variables need to be removed from the model.

Table 5 shows that product scarcity (PS) has a positive and statistically significant impact on competitive arousal (COMP), with a coefficient of $\beta = 0.425$ ($p < 0.001$). This indicates that as the level

of product scarcity increases, consumers tend to be more stimulated to compete. At the same time, product scarcity also strongly and positively affects fear of missing out (FOMO) with a coefficient of $\beta = 0.673$ ($p < 0.001$), reflecting that scarcity promotes the fear of missing out on a purchase opportunity.

Next, Fear of Missing out (FOMO) has a significant impact on herding behavior (HB) with a coefficient of $\beta = 0.594$ ($p < 0.001$). This result shows that individuals with a high level of FOMO are more likely to be caught up in crowd buying behavior. Herding behavior (HB) also showed a relationship with impulsive purchase (IP) with coefficient $\beta = 0.547$ ($p < 0.001$). Besides, competitive arousal (COMP) had a positive impact on impulsive purchase (IP) with coefficient $\beta = 0.124$ ($p = 0.001$) showing that the competitive factor can promote impulsive purchasing decisions.

As a moderator, self-control (SC) weakened the relationship between COMP and IP with $\beta = -0.153$, ($p = 0.001$), indicating that when self-control is high, consumers are less influenced by competition to make impulsive purchases. On the contrary, SC strengthened the relationship between HB and IP with $\beta = 0.126$, ($p = 0.007$), indicating that even individuals with high self-control can be influenced by herding behavior.

Table 4. Collinearity statistics (inner VIF)

Variable	COMP	FOMO	HB	IP	PS	SC	COMP * SC	HB * SC
COMP	–	–	–	1.325	–	–	–	–
FOMO	–	–	1.000	–	–	–	–	–
HB	–	–	–	1.259	–	–	–	–
IP	–	–	–	–	–	–	–	–
PS	1.000	1.000	–	–	–	–	–	–
SC	–	–	–	1.524	–	–	–	–
COMP * SC	–	–	–	1.629	–	–	–	–
HB * SC	–	–	–	1.633	–	–	–	–

Table 5. Results of hypothesis testing

Hypothesis	Relationship	Original sample (O)	Sample mean (M)	Standard deviation	t-statistics	p-values	Outcome
H1	PS → COMP	0.425	0.429	0.046	9.24	< 0.001	Supported
H2	PS → FOMO	0.673	0.673	0.030	22.357	< 0.001	Supported
H3	FOMO → HB	0.594	0.596	0.044	13.473	< 0.001	Supported
H4	COMP → IP	0.124	0.123	0.048	2.597	0.010	Supported
H5	HB → IP	0.547	0.546	0.041	13.31	< 0.001	Supported
H6	SC moderates COMP → IP	-0.153	-0.154	0.045	3.379	0.001	Supported
H7	SC moderates HB → IP	0.126	0.128	0.046	2.716	0.007	Supported

Notably, the direct relationship between SC and IP ($\beta = 0.115, p = 0.016$) was not accepted in this study, as SC was only considered as a moderator.

In summary, all seven hypotheses proposed from the research model were accepted, proving the reasonableness of the theoretical framework and the indicators used in the study. These results have clarified and achieved the previous research objectives, offering meaningful contributions and new directions for future research. Most of the relationships between variables in the model have p-values less than 0.05, indicat-

ing that the hypothesized relationships are very reliable and statistically significant. The PLS-SEM result is illustrated in Figure 2.

The relationships between product scarcity (PS) and competitive arousal (COMP), product scarcity (PS) and fear of missing out (FOMO), fear of missing out (FOMO) and herding behavior (HB), competitive arousal (COMP) and impulsive purchase (IP), herding behavior (HB) and impulsive purchase (IP) are positive and congruent effects. However, the direct relationship between self-control (SC) and impulsive pur-

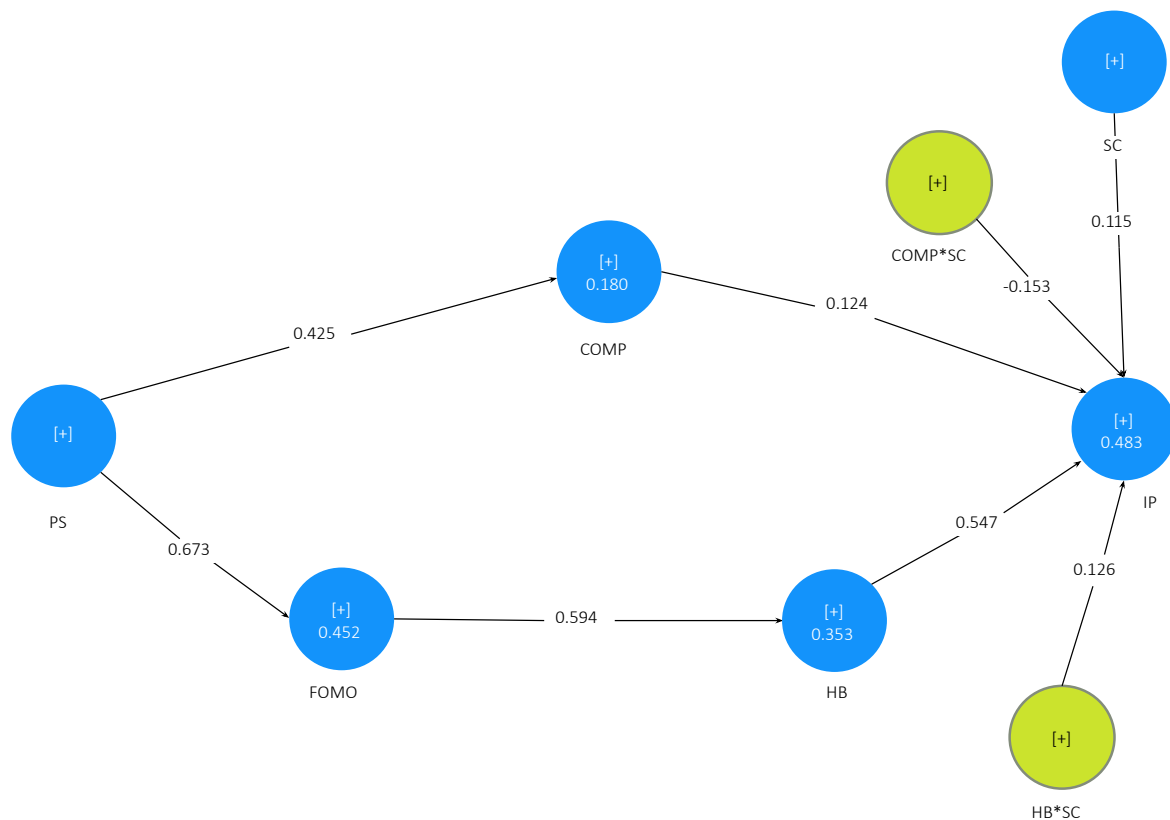


Figure 2. PLS-SEM result

chase (IP) had a p-value of 0.016 but was not accepted. It may be explained that, in this study, SC was assessed as a moderator in the relationship between COMP and IP and the relationship between HB and IP. Therefore, the study did not assess the direct impact of SC on IP, so this hypothesis was not accepted.

Similar to previous studies emphasizing the role of scarcity in stimulating psychological responses (Aggarwal et al., 2011), this study shows that product scarcity also indirectly affects impulsive buying behavior through these factors. From the research results, product scarcity (PS) has a significant positive impact on competitive arousal (COMP) ($\beta = 0.425$). This means that consumers feel more competitive when faced with limited and exclusive products, which makes them want to win more. The results of this hypothesis *H1* are completely consistent with the studies of Broeder and Wentink (2022) and Serravalle et al. (2023).

Besides, product scarcity also positively affects customers' fear of missing out ($\beta = 0.673$). People with this mentality will feel anxious or jealous when they do not participate in activities that others are doing. They will feel different when they cannot own or access what others have. Therefore, the scarcer the product is, the stronger their fear of missing out will be. This result is completely consistent with the research of Zhang et al. (2021) and Zhang et al. (2022).

Furthermore, from the research results, the relationship between PS and FOMO (*H2*) is stronger than the relationship between PS and COMP (*H1*) when the original sample (O) value of *H2* is greater than *H1* ($0.673 > 0.425$). This means that product scarcity stimulates customers' fear of missing out more strongly than it stimulates their competitive psychology.

The results of this study demonstrated that the fear of missing out has a positive impact on herding behavior ($\beta = 0.594$). This means that when customers have a fear of missing out on products that are considered scarce, it leads to herding behavior, they are influenced by the decisions of the crowd around them. This result is consistent with the study of Komalasari et al.

(2021), when they argued that one of the causes of herding behavior is the fear of missing out.

The results also showed that herding behavior (HB) is the variable that has the most decisive influence on impulsive purchase (IP), with an original sample (O) value of 0.547. This makes sense because, nowadays, when everyone is participating in shopping, consumers may feel motivated or pressured to make an immediate purchase decision, even if they do not need the item. Besides, when many people choose a product, customers may believe it is valuable or high-quality, even if it is not. Following herding behavior (HB) in terms of its impact on impulsive purchase (IP) is competitive arousal (COMP), with an original sample (O) value of 0.124. This stimulation can increase the desire to "win" over other buyers in a shopping context. When this psychological factor becomes strong, purchasing decisions become more impulsive because the motivation to buy does not come from real needs but mainly from feeling stimulated and motivated by interpersonal competition.

This study examines self-control (SC) as a moderator. The results show that self-control (SC) plays a negative moderator role in the relationship between competitive arousal (COMP) and impulsive purchase (IP), with the original sample (O) value of -0.153 . This shows that when the level of self-control increases, the influence of competitive stimulation on the impulsive purchasing behavior of consumers will decrease. On the contrary, if self-control is low, customers will find it difficult to control the stimulation caused by competition, which can easily lead to impulsive purchasing decisions. Besides, self-control (SC) also plays a positive moderating role in the relationship between herding behavior (HB) and impulsive purchase (IP). This is an interesting finding, according to which even people with high self-control can be influenced by crowd behavior, leading to impulsive decision-making. This explains why people with good self-control cannot resist social pressure if they feel that following the majority is reasonable or gives them a sense of security. Therefore, when placed in the context of trend-driven shopping, even high-calibration customers may waver and make unplanned purchases to fit in or avoid falling behind other consumers.

CONCLUSION

This study explored the impact of scarcity marketing on impulsive buying behavior through psychological factors. The results showed that scarcity can strongly influence psychological responses such as FOMO and competitive arousal, thereby promoting impulsive buying behavior through mediating factors such as herding behavior. Notably, self-control ability plays an important role in the relationship with impulsive buying behavior, indicating that consumer behavior is not only influenced by external influences but also greatly influenced by internal personal factors. These findings not only contribute to clarifying the psychological mechanism governing consumer behavior in the context of scarcity and expanding the theoretical understanding of impulsive buying behavior, but also bring practical implications for businesses in the context of a dynamic marketing environment.

The study contributes to the theory by expanding the analysis of impulsive consumer behavior in the context of emerging markets such as Vietnam, while reflecting the global trend where social and psychological factors increasingly influence purchasing decisions, especially in the e-commerce environment. The novelty of the study is the addition of a moderating variable of personal autonomy: the ability to control increases the influence of herding behavior on impulsive shopping behavior but weakens the impact of competitive stimuli on impulsive shopping behavior, thereby showing that social pressure can both promote and inhibit consumer behavior.

With the research results achieved, organizations and marketers should focus on researching customer insights, and clearly distinguish between low- and high-involvement products to build appropriate scarcity strategies. This way, it helps create a positive psychological impact, promoting impulsive buying behavior while maintaining customer trust. Besides, businesses can take advantage of the power of herd behavior by developing electronic word-of-mouth (e-WOM) channels, both attracting potential customers and strengthening the loyalty of current customers. Besides, proactive management and control of communications is necessary to avoid misunderstandings and protect brand reputation. Finally, businesses should not rely too much on scarcity strategies but need to invest in improving product quality and customer experience, thereby building a sustainable brand in the long term.

Although the model makes an important contribution to explaining the relationship between psychological factors and impulsive behavior, the study is limited by focusing only on the 16-27 age group in Vietnam and mainly those with shopping experience. The study also ignores some other factors that influence impulsive buying behavior such as product necessity and the long-term impact of Scarcity Marketing. Therefore, future studies need to expand the sample, national scope and add related variables to bring about more comprehensive and applicable results. Besides, the study also lays the foundation for future directions by suggesting the integration of new technologies such as artificial intelligence and real-time behavioral analysis in e-commerce, in line with modern research trends on the intersection of technology and consumer behavior.

AUTHOR CONTRIBUTIONS

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APPENDIX A

Table A1. Summary of constructs and measurement items

Constructs	Coding	Measure items	Source
Product scarcity	PS1	When shopping, I often think about deadlines	Serravalle et al. (2023)
	PS2	When shopping, I often worry about the limited availability of the product	
	PS3	When shopping, I often worry about the limited quantity of the product	
	PS4	I tend to worry about the "Sold-out" sign on products I see or that I am interested in	
Competitive arousal	COMP1	I consider other potential buyers my rivals, especially when the product is in limited supply	Serravalle et al. (2023)
	COMP2	Buying a desired product that is scarce gives me "a sense of victory"	
	COMP3	I need to strategize carefully to purchase products advertised as scarce	
Fear of missing out	FOMO1	I am anxious when I miss the chance to get the products advertised as "Limited Quantity" and "Limited Time"	Zhang et al. (2022)
	FOMO2	I keep track of what others buy during Scarcity Marketing Campaigns to avoid missing out	
	FOMO3	I am worried when others buy the products advertised as "Limited Quantity" and "Limited Time"	
	FOMO4	I align my shopping habits with others to avoid missing out.	
Herding behavior	HB1	I will be concerned about whether others like these products.	Su et al. (2023)
	HB2	I will feel more comfortable selecting the same product as the majority	
	HB3	I will observe how others react after purchasing to gather my insights about these products	
	HB4	When I select products, I have sought advice from others	
Impulsive purchase	IP1	During a flash sale, I strongly desire to make a purchase	Zhang et al. (2022)
	IP2	I often experience a sudden urge to shop during flash sales	
	IP3	I am much more likely to purchase after checking out the product's promotional details	
Self-control	SC1	I often act without thinking when buying products offered with limited quantity and time-limited	Chen et al. (2022)
	SC2	I feel excited when buying products in limited quantities and in a limited amount of time, even if they are unnecessary	
	SC3	I cannot resist buying products offered in limited quantities and in limited time, even if they are unnecessary	