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Why Do K-Pop Fans Buy Impulsively? A Study on Perceived Scarcity, FOMO, and Self-Control

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Abstract:

Background: The development of Korean pop culture (K-pop) has become a global phenomenon that permeates various aspects of life, including Indonesia. Its success extends beyond the entertainment sector, significantly influencing the lifestyle and consumption behaviour of its enthusiasts. Many fans are not only passionate about their idols' music and performances but also tend to purchase merchandise impulsively.

Purpose: This study aims to examine the impact of perceived scarcity on impulsive buying behaviours for K-Pop merchandise, by exploring the mediating role of FOMO and the moderating effect of self-control.

Method: Using a quantitative approach, data were collected through an online survey of 358 K-pop fans in Indonesia, selected via purposive sampling, and analysed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method.

Findings: The findings indicate that perceived scarcity has a positive and significant influence on FOMO, which in turn enhances impulsive buying behaviour. However, perceived scarcity does not directly affect impulsive buying without the mediating role of FOMO. Moreover, self-control significantly moderates the relationship between FOMO and impulsive buying by weakening the effect, indicating that individuals with greater self-control are less likely to engage in impulsive purchases despite experiencing FOMO.

Conclusions: This research highlights the significant influence of FOMO on impulsive buying behaviour among K-Pop fans, particularly in the context of scarcity-based marketing. In contrast, self-control functions as a mitigating factor.

Research implication: The findings provide valuable insights for marketers to implement ethical scarcity-based strategies while encouraging responsible consumer behaviour among K-Pop fans.

Keywords: fear of missing out, impulsive buying, merchandise, perceived scarcity, self-control

JEL Classification: M31, D91



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PUBLIC INTEREST STATEMENT

In today's digital age, scarcity-driven marketing strategies have become increasingly common. This study explores how perceived scarcity and FOMO (Fear of Missing Out) influence impulse buying behaviour among K-pop fans, with self-control as a moderating factor. Understanding these psychological mechanisms may provide insights for consumers and businesses on the ethical and strategic implications of scarcity marketing.

However, this research faces several challenges, including the difficulty of obtaining reliable self-reported data due to the subjective nature of impulse buying tendencies. In addition, measuring the intensity of FOMO in a fast-paced, social media-driven environment is challenging to ensure accurate representation. Despite these obstacles, this study contributes to a deeper understanding of consumer behaviour.



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1. Introduction

Korean pop culture, commonly known as K-Pop, has emerged as a global phenomenon in recent years, including in Indonesia, where the fan community has grown rapidly. Through the cultural phenomenon known as Hallyu, or the 'Korean Wave', K-Pop music has become a major driving force that not only dominates the entertainment industry but also shapes the lifestyle and consumption behaviour of its fans. According to a Twitter analysis published on 26 January 2022, Indonesia was identified as the country with the highest number of K-pop fans globally in 2021 and ranked first in K-pop discussions on Twitter for the second consecutive year (GoodStats, 2022). The widespread popularity of K-Pop today is sustained by the strong loyalty and enthusiasm of fans, exemplified by their purchase of goods produced by the agencies representing their idol (Ardhiyansyah et al., 2021). K-pop fans are often characterized by excessive, obsessive, addictive, and consumptive behaviours, demonstrated by their willingness to spend considerable amounts on merchandise related to their idols or to follow their idols in considerable amounts (Dinningrum & Satiti, 2021). In pop culture, merchandise plays a crucial role in the fan experience, particularly among K-pop fans, commonly referred to as K-poppers. Fans perceive merchandise not only as souvenirs but also as expressions of support for their idols and symbols of social status within the fan community. Owning limited-edition merchandise can enhance fans' prestige, generating a sense of urgency to acquire the product before the opportunity expires.

Scarcity marketing is a critical strategy for attracting K-Pop fans. Merchandise, such as special edition photocards or exclusive albums, functions as both souvenirs and symbols of social status within the fan community. For example, the release of the Armageddon CD player version by aespa and Special Yearbook Photo Cards by NCT illustrates how scarcity can stimulate impulsive purchasing among fans. K-pop fans in Indonesia frequently engage in impulse buying. Impulse buying, also referred to as impulsive buying, is defined as a purchase made hastily and without prior planning in the buyer's mind (Applebaum, 1951; Rani & Catherine, 2023).

K-Pop merchandise is frequently produced in limited quantities, generating a perception of scarcity among fans. This perception can exert pressure on consumers, prompting unplanned purchases (Cengiz & Şenel, 2024). Perceived scarcity refers to an actual or perceived threat to consumers' ability to satisfy their needs and desires, arising from limited or difficult access to goods, services, or resources (Hamilton et al., 2019). Scarcity triggers FOMO by creating a perceived need or desire for a limited resource, whereby the fear of missing out intensifies the motivation to acquire it (Dahmiri et al., 2023).

This phenomenon is exacerbated by the influence of social media, especially Twitter and Instagram, which serve as primary platforms for K-pop fans to share experiences and showcase their merchandise collections. Social media increases users' access to real-time information while simultaneously heightening the sensation of Fear of Missing Out (FOMO). FOMO refers to the anxiety consumers experience when they fear missing an opportunity or experience that others have had (Zhang et al., 2022). Individuals experiencing FOMO often imitate those they follow on social media, heightening their fear of missing out on opportunities and trends. They are also more susceptible to the opinions and comments of others, which can trigger emotionally driven impulsive purchases (Çelik et al., 2019). According to Çelik et al. (2019), FOMO is a dominant factor influencing impulsive behaviour, particularly among active social media users.

In addition to FOMO and perceived scarcity, self-control is another factor that influences impulse buying behaviour. Xu et al. (2020) found that self-control significantly affects

impulsive purchasing. As a key component in decision-making, self-control enables individuals to regulate their urges, emotions, and desires (Sela et al., 2017; Xu et al., 2020). Research indicates that individuals with high self-control tend to experience fewer emotional fluctuations and exhibit lower impulsivity across various aspects of life (Kakkar et al., 2022).

This study is grounded in the Stimulus-Organism-Response (S-O-R) theory, which posits that external stimuli (perceived scarcity) elicit psychological responses (FOMO) that ultimately influence consumer behaviour (impulsive buying) (Cengiz & Şenel, 2024). Although several studies have examined the effects of perceived scarcity and FOMO on impulsive buying, the moderating role of self-control has largely been overlooked. Studies by Cengiz & Şenel (2024) and Dahmiri et al. (2023) suggest that perceived scarcity and FOMO can drive impulsive behaviour in the context of limited product consumption. However, these studies do not address how self-control may mitigate the influence of FOMO on impulsive buying.

This study offers a novel perspective by incorporating self-control as a moderating factor within the S-O-R framework, thereby enhancing understanding of how consumers regulate impulsive tendencies despite experiencing FOMO. Addressing a timely issue, this research examines the rising impulsive purchasing behaviour among K-pop fans driven by scarcity-based marketing and social media influence. Understanding these psychological mechanisms is crucial for developing ethical and sustainable marketing strategies that balance business objectives with consumer well-being.

By applying the Stimulus-Organism-Response (SOR) theory, this study aims to deepen the understanding of K-pop fans' consumption behaviour and the psychological factors influencing their purchasing decisions. Additionally, it highlights the importance of self-control in resisting impulse purchases, providing valuable insights for developing marketing strategies that prioritize both consumer interests and long-term brand sustainability.

2. Literature Review

2.1 Stimulus-Organism-Response (S-O-R) Theory

The S-O-R (Stimulus-Organism-Response) theory, first introduced by Mehrabian and Russel in 1974, is a psychological model that explains how an external stimulus affects an individual's internal state (organism) and elicits a specific response. According to the S-O-R theory, external stimuli influence consumers' internal states, which subsequently affect their overall responses (Manganari et al., 2011). Eroglu et al. (2001) define a stimulus (S) as a cause or effect that can evoke a reaction within an individual's internal state. In marketing, the stimulus encompasses various external factors encountered by consumers, such as advertisements, discount promotions, or scarcity offers. According to the S-O-R (Stimulus-Organism-Response) theory, the response (R) represents the individual's final decision or outcome, manifested as either approach or avoidance behaviour (Kumala et al., 2024). The response stage in this theory encompasses the actions individuals take after receiving and processing a stimulus within the organism. Responses may include purchase decision, brand loyalty, or impulsive buying.

In impulse buying research, the S-O-R theory is particularly relevant, as it explains how product scarcity (stimulus) influences perceptions of scarcity and emotions like FOMO (organism), which subsequently drive impulsive buying behaviour (response). Cengiz and Şenel (2024) found that product promotions emphasizing scarcity and urgency effectively influence consumers' internal processes, generating emotional pressure that prompts

unplanned purchases. Using the S-O-R framework, this study explores how external factors in K-pop merchandise marketing—such as exclusive promotions and product scarcity— influence consumers' psychological processes and trigger impulsive purchase decisions. Although Self-Control is not part of the primary Stimulus-Organism-Response (S-O-R) sequence, this study considers it as a moderating variable operating outside the core framework. It moderates the relationship between the organism (FOMO) and the response (impulsive buying), providing deeper insight into how individual traits influence consumer decision-making. This enables the model to incorporate individual self-regulatory mechanisms that may either strengthen or diminish behavioural responses elicited by emotional stimuli.

2.2 The Effect of Perceived Scarcity on Fear of Missing Out

Hamilton et al. (2019) define perceived scarcity as consumers' subjective perception of limited products availability and resources. Perceived scarcity refers to the perception that an item is considered scarce at a certain time and place, often due to deliberate marketing strategy (Gupta & Gentry, 2019). Consumers frequently make purchasing decisions based on their perception of a product (Rachmawati & Muflikhati, 2017). Scarcity can be classified into two categories: time-based and quantity-based. Time-based scarcity arises when a product or service is accessible for a limited duration, with its period of availability indicating its scarcity (Wu & Lee, 2016). Meanwhile, quantity-based scarcity arises when the availability of a product or service is restricted due to limited production or high demand (Gierl & Huettl, 2010; Hao & Huang, 2024). This condition amplifies the experience of Fear of Missing Out (FOMO), as consumers become increasingly anxious about potentially losing the chance to purchase a desired item. Previous research has demonstrated that perceived scarcity can intensify FOMO, as individuals are driven to act quickly to avoid the anticipated regret of missing out on rare or valuable opportunities. Studies by Patel et al. (2024), Cengiz and Şenel (2024), and Dahmiri et al. (2023) confirm that perceived scarcity significantly contributes to the emergence of FOMO among consumers.

H1: Perceived scarcity has a significant effect on fear of missing out (FOMO)

2.3 The Effect of Perceived Scarcity on Impulsive Buying

According to Gupta and Gentry (2019), perceived scarcity refers to the consumer's belief that a product is rare at a specific time and place, with such scarcity often being strategically created by marketers. This perception can drive impulsive buying behaviour, as scarcity enhances the perceived value of a product. When an item is seen as limited in availability, consumers may experience a sense of urgency, prompting immediate purchase decisions without careful consideration. This urgency stems from the fear that the opportunity to obtain the product may not reoccur. Supporting this notion, Zhang et al. (2022) reported that scarcity significantly influences purchasing behaviour. Similarly, Hao and Huang (2024) reported that scarcity positively impacts impulsive buying, largely due to its strong psychological effects on consumer decision-making.

H2: Perceived scarcity has a significant effect on impulsive buying

2.4 The Effect of Fear of Missing Out (FOMO) on Impulsive Buying

FOMO refers to the anxiety that consumers experience due to concerns about missing out on opportunities or valuable experiences enjoyed by others (Dahmiri et al., 2023). Marketing strategies that emphasize product scarcity or exclusivity often leverage the FOMO effect to stimulate spontaneous purchasing behaviour (Dinh & Lee, 2022). The urge to purchase is frequently driven not by necessity but by social pressure to keep up with others (Dahmiri et al., 2023). In academic literature, FOMO is regarded as a psychological impulse that encourages consumers to buy or consume products, especially when affected by scarcity (Herman, 2011; Dinh & Lee, 2022). Research by Maharani et al. (2024) indicates that FOMO has a significant influence on impulsive buying. This finding aligns with studies by Widodo (2023) and Çelik et al. (2019) who found that FOMO increases the likelihood of impulse purchases, as consumers feel compelled to act immediately to avoid potential loss or regret.

H3: Fear of missing out (FOMO) has a significant effect on impulsive buying

2.5 The Effect of Perceived Scarcity on Impulsive Buying mediated by Fear of Missing Out (FOMO)

Zhang et al. (2020) explain that Fear of Missing Out (FOMO) is influenced by both personal and social factors, referring to the anxiety individuals experience when they fear being excluded from valuable experiences or opportunities. Previous studies by Patel et al. (2024), Cengiz and Şenel (2024), and Dahmiri et al. (2023) have demonstrated that FOMO serves as a mediating variable in the relationship between perceived scarcity and impulsive buying. When consumers perceive a product as scarce, they are more likely to experience FOMO due to concerns about missing the opportunity to obtain it. This heightened urgency driven by FOMO, subsequently increases the likelihood of impulsive purchasing behavior, as consumers feel compelled to act quickly to avoid regret.

H4: Fear of missing out (FOMO) has a significant effect in mediating the effect of perceived scarcity on impulsive buying

2.6 The Effect of Perceived Scarcity on Impulsive Buying mediated by Fear of Missing Out (FOMO)

Self-control is defined as an individual's ability to regulate their responses to temptations or impulses, particularly those that may hinder the achievement of long-term goals (Baumeister & Newman, 1994). Individuals with high self-control tend to be more reflective, capable of delaying gratification, and mindful of long-term consequences before making purchasing decisions (Kakkar et al., 2022). However, those with low self-control are more vulnerable to external factors, such as scarcity-driven marketing strategies or FOMO, which increases their likelihood of engaging in impulsive buying (Dhandra, 2020).

In consumer behaviour research, self-control is often examined as a moderating variable that mitigates the effect of psychological aspects on impulsive buying, enabling individuals to regulate their purchasing decisions despite external pressures. Kumala et al. (2024) found that self-control moderates the impact of social influence and online reviews on impulsive buying. Similarly, Sun et al. (2024) reported that self-control negatively moderates the relationship between positive emotions and both the urge to buy impulsively and impulsiveness itself. Mao et al. (2018) also confirmed that self-control counteracts impulsivity and plays a crucial role in rational decision-making. Therefore, self-control serves as a protective mechanism that helps consumers maintain

focus on financial goals and resist impulse purchases driven by social pressure or urgency-based marketing strategies.

H5: Self-control has a significant influence in moderating the effect of fear of missing out (FOMO) on impulsive buying.

3. Conceptual Framework

Based on the reviewed empirical studies, this study hypothesizes that perceived scarcity and fear of missing out (FOMO) influence impulsive buying behaviour in the context of K-pop merchandise purchases. Additionally, self-control is expected to moderate the relationship between FOMO and impulsive buying by weakening its effect. Furthermore, FOMO is proposed to mediate the relation between perceived scarcity and impulsive buying. The conceptual framework is presented in Figure 1.

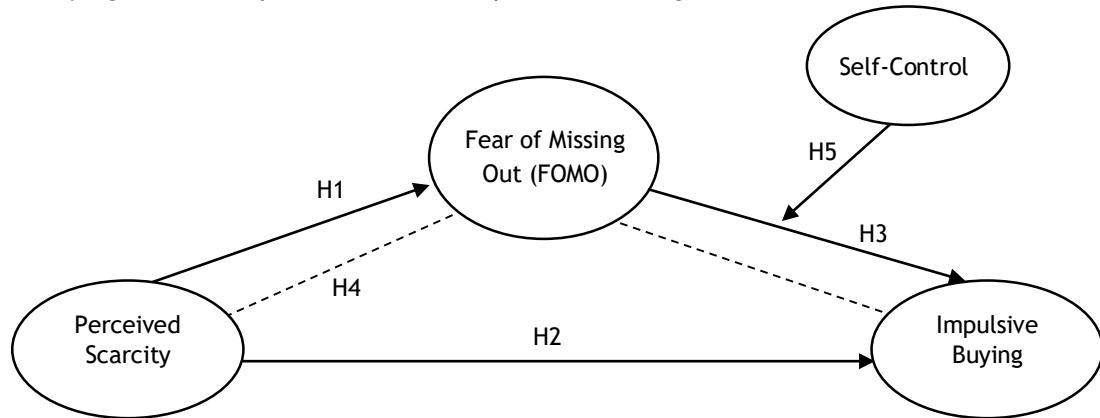


Figure 1. Conceptual framework of impulsive buying behaviour, influenced by perceived scarcity and fear of missing out (FOMO), with self-control as a moderating factor

The hypotheses of this study are as follows:

- H1: Perceived scarcity has a significant effect on fear of missing out (FOMO)
- H2: Fear of missing out (FOMO) has a significant effect on impulsive buying
- H3: Perceived scarcity has a significant effect on impulsive buying
- H4: Fear of missing out (FOMO) has a significant effect in mediating the effect of perceived scarcity on impulsive buying
- H5: Self-control has a significant influence in moderating the effect of fear of missing out (FOMO) on impulsive buying.

4. Methods

4.1 Research Design

This study was conducted among K-pop merchandise consumers in Indonesia. The research employs a cross-sectional survey design, collecting data at a single point in time to define the characteristics of the population or phenomenon. This method captures the current state of variables under investigation without requiring repeated observations. The research also employs an explanatory approach to identify causal relationships between variables, determine influencing factors, and explain these connections based on strong empirical evidence.

4.2 Sampling

This study employed a purposive sampling technique to ensure the inclusion of participants relevant to the research objectives. The inclusion criteria required

respondents to be active social media users residing in Indonesia who had purchased K-pop merchandise at least once in the past 12 months. These criteria were selected to ensure that the sample comprised individuals engaged in digital fan culture and had recent experience purchasing K-pop merchandise—factors central to this study's focus on perceived scarcity, FOMO, and impulsive buying behavior. The minimum target sample size was 220 respondents, determined based on the guidance from Hair et al. (2017), which recommends that the smallest possible sample size be ten times the total number of indicators used in the research model.

To evaluate the representativeness of the sample, the demographic profile of respondents was compared with existing data on the Indonesian K-pop fans. According to a survey by IDNTimes (2019), Indonesian K-popers are predominantly female (92.1%) and largely within the 17-27 age range. Additionally, Katadata Insight Center (2022) reported that most K-pop fans in Indonesia are Gen Z and Millennials. In this study, 375 responses were collected, with 358 deemed valid and included in the final analysis; 97.2% identified as female and the majority were aged 21-25 years. These similarities indicate that the sample used in this study is representative of the broader Indonesian K-pop fan population, thereby enhancing the reliability and generalizability of the findings.

4.3 Measurement

The research utilized Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree) for data collection. It examines four key variables—perceived scarcity, fear of missing out (FOMO), self-control, and impulsive buying—using a total of 22 indicators. The measurement items for perceived scarcity are adapted from Park et al. (2022) and Yuen et al. (2022), while the indicators for FOMO are based on Fumar et al. (2023). Self-control is measured using scales developed by Fumar et al. (2023), and impulsive buying is assessed following the framework of Çelik et al. (2019). Each variable is operationalized using validated scales from previous studies to ensure reliability and validity. A detailed breakdown of the measurement items and their sources is presented in Table 1, which outlines the research instruments used in this study.

Table 1. Operational definition and variable indicators of the variables studied

Variables	Operational Definition	Indicators
Perceived Scarcity (Park et al., 2022; Yuen et al., 2022)	The consumer's perception of the limited amount or time available to buy K-Pop merchandise, which encourages consumers to make purchases immediately.	1) It is not easy to find this K-pop merchandise (PS1) 2) The process of getting this K-pop merchandise is quite difficult (PS2) 3) The availability of this K-pop merchandise is very limited (PS3) 4) The K-pop merchandise I want is only available in limited quantities (PS4) 5) Some editions of K-pop merchandise are only produced in limited quantities (PS5)

Table 1. Operational definition and variable indicators of the variables studied (Continue)

Variables	Operational Definition	Indicators
Fear of Missing Out (Fumar et al., 2023)	A feeling of uneasiness arising from the concern of missing opportunities or valued experiences that others are enjoying, frequently resulting in impulsive behaviour.	<p>1) I am often tempted to buy K-pop merchandise so that I don't miss out on fandom trends (FM1)</p> <p>2) I like to show my K-pop merchandise collection on social media (FM2)</p> <p>3) I feel anxious when I see other fans buying the latest edition of K-pop merchandise (FM3)</p> <p>4) I feel anxious if I don't buy the exclusive merchandise that other fans buy (FM4)</p> <p>5) I feel uneasy when I see other fans owning rare K-pop merchandise more (FM5)</p>
Self-Control (Fumar et al., 2023)	An individual's ability to control impulses, emotions, and desires, so as to make rational decisions that support long-term goals and avoid impulse buying behaviour on K-Pop merchandise.	<p>1) I always think carefully before buying K-pop merchandise (SC1)</p> <p>2) I can resist the urge to buy K-pop merchandise that I don't need (SC2)</p> <p>3) I am able to control the impulsive desire to buy K-pop merchandise spontaneously (SC3)</p> <p>4) I can delay satisfaction by not immediately buying K-pop merchandise that I want (SC4)</p> <p>5) I am not easily influenced by unnecessary K-pop merchandise (SC5)</p>
Impulsive Buying (Çelik et al., 2019)	The act of purchasing K-Pop merchandise spontaneously, without extensive consideration, and can occur due to emotional triggers and external stimuli, which often override the rational decision-making process.	<p>1) I often buy K-pop merchandise without much consideration (IB1)</p> <p>2) The statement 'I see K-pop merchandise, then buy it' fits me perfectly (IB2)</p> <p>3) The idea of 'Buy now, think later' often reflects my behaviour in buying K-pop merchandise (IB3)</p> <p>4) I often make spontaneous purchases of K-pop merchandise without planning (IB4)</p> <p>5) The phrase 'Just do it' describes my way of shopping for K-pop merchandise (IB5)</p> <p>6) Sometimes, I feel a deep desire to buy K-pop merchandise on the spur of the moment (IB6)</p> <p>7) I buy K-pop merchandise based on how I feel at the time (IB7)</p>

4.4 Data Collection

This study utilized a questionnaire with three primary sections. The initial segment provided fundamental information regarding the study. The second part collected respondents' demographic data, including gender, age, educational attainment, and employment status. Participants were also asked to respond to questions regarding their recent experiences acquiring K-Pop merchandise. The third section consisted of measurement scales for the four principal variables in the study model, including a series of questions adapted from previous research. Data collection was conducted online using Google Forms and distributed via social media platforms such as X (Twitter), WhatsApp, and Instagram to K-Pop fans who met the research criteria. Only respondents meeting specific criteria proceeded to answer research-related questions, which were assessed using a 5-point Likert scale.

4.5 Data Analysis

In this study, validity, reliability, hypothesis testing, mediation, and moderation were examined using Smart-PLS. The outer model evaluation assessed construct validity and reliability through factor loadings, Average Variance Extracted (AVE), Cronbach's Alpha, and Composite Reliability (CR). Factor loadings ≥ 0.70 were considered ideal, while values between 0.50 and 0.70 were acceptable under certain conditions. AVE values ≥ 0.50 indicated good convergent validity, while Cronbach's Alpha and Composite reliability values ≥ 0.70 demonstrated strong construct reliability. Additionally, cross-loadings were analyzed to confirm discriminant validity.

The inner model evaluation examined the relationships between latent constructs using path coefficients, bootstrapping for statistical significance, and R-squared (R^2) values. The R^2 values indicated the model's predictive strength and were categorized as substantial (≥ 0.67), moderate (0.33-0.66), or weak (0.19-0.32) (Chin, 1998). Mediation analysis was conducted to identify indirect effects, with bootstrapping employed to test their significance.

5. Findings

5.1 Respondent Characteristics

Table 2 presents the descriptive data of the survey sample, revealing that 2.8% of respondents were male and 97.2% were female. Furthermore, 30.8% held a bachelor's degree or higher, with the majority (60.1%) aged between 21 and 25. The findings indicate that the target demographic in this study primarily consists of young individuals, predominantly female, with educational qualifications ranging from high school to bachelor's degree, most of whom are students or early-career professionals.

Table 2. Demographic characteristics of research respondents

Variables	Category	Frequency (n)	Percentage (%)
Gender	Male	10	2.8
	Female	348	97.2
Age	≤ 20 years	100	27.9
	21-25 years	215	60.1
	26-30 years	37	10.3
	> 30 years	6	1.7

Table 2. Demographic characteristics of research respondents (Continue)

Variables	Category	Frequency (n)	Percentage (%)
Education Level	High school	207	57.8
	Diploma	40	11.2
	Bachelor	101	28.2
	Master	10	2.8
	Doctoral	0	0
Occupation	Students	237	66.2
	Employees	63	17.6
	Entrepreneur	9	2.5
	Other	49	13.7
Total		358	100

5.2 Validity and Reliability Test

Validity was tested using convergent and discriminant validity. Convergent validity was evaluated through outer loading values and Average Variance Extracted (AVE). Following the validity test, one indicator from the Perceived Scarcity construct, one from the FOMO construct, and two from the impulsive buying construct were removed due to values below 0.7. After removing these indicators and retesting, the results indicated that all remaining indicators possess outer loadings beyond 0.7, and the AVE values for all constructs exceeded 0.5. Therefore, it can be concluded that the research instrument demonstrates strong convergent validity.

Reliability was measured using Cronbach's Alpha and Composite Reliability (CR). Cronbach's Alpha values exceeded 0.7 for all variables, indicating good internal consistency. Similarly, the Composite Reliability (CR) value exceeded 0.7, signifying that all constructs within the model demonstrate an adequate degree of reliability. Table 3 summarizes the results of the validity and reliability tests for the measurement model used in this study.

Table 3. The validity and reliability of the measurement model

Variables Measurement	Outer Loadings	AVE	Cronbach's Alpha	Composite Reliability
Fear of Missing Out (FOMO)		0.756	0.891	0.925
FM1	0.746			
FM3	0.908			
FM4	0.926			
FM5	0.888			
Impulsive Buying		0.660	0.871	0.907
IB1	0.803			
IB2	0.847			
IB3	0.770			
IB4	0.816			
IB5	0.825			
Perceived Scarcity		0.689	0.848	0.898
PS1	0.851			
PS2	0.884			
PS3	0.837			
PS4	0.744			

Table 3. The validity and reliability of the measurement model (Continue)

Variables Measurement	Outer Loadings	AVE	Cronbach's Alpha	Composite Reliability
Self-Control		0.676	0.880	0.912
SC1	0.815			
SC2	0.858			
SC3	0.840			
SC4	0.841			
SC5	0.754			

The final step in evaluating construct validity is assessing discriminant validity. Based on data processed in Smart-PLS, discriminant validity is evaluated by comparing the cross-loading values of each indicator. Discriminant validity is established if an indicator's loading on its respective latent variable is higher than its loadings on other variables. The test results confirm that each indicator exhibits the highest loading on the construct it is intended to measure. For instance, the FOMO indicators (FM1 to FM5) have the highest loading values on the FOMO construct (e.g., FM4 = 0.926), while the impulsive buying indicators (IB1 to IB5) have the highest loading values on the impulsive buying construct (e.g., IB5 = 0.825). Similarly, the perceived scarcity indicators (PS1 to PS4) have the highest loading values on the perceived scarcity construct (e.g., PS2 = 0.884), and the self-control indicators (SC1 to SC5) have the highest loading values on the self-control construct (e.g., SC2 = 0.858). These results demonstrate that all indicators in this study meet the criteria for discriminant validity, as they exhibit stronger relationships with their specific constructs than with other constructs. Consequently, this reinforces the reliability of the research instruments used.

5.3 Hypothesis Testing

This study employs hypothesis testing to examine the associations among latent variables in the structural model using the t-statistic test. At a 5% significance level ($\alpha = 0.05$) with a two-tailed test, a relationship is considered significant if the t-statistic exceeds 1.96 and the p-value is less than 0.05. This test evaluates whether the independent variable significantly impacts the dependent variable within the research model. The findings are presented in Figure 2, which illustrates the hypothesis testing results and their statistical significance.

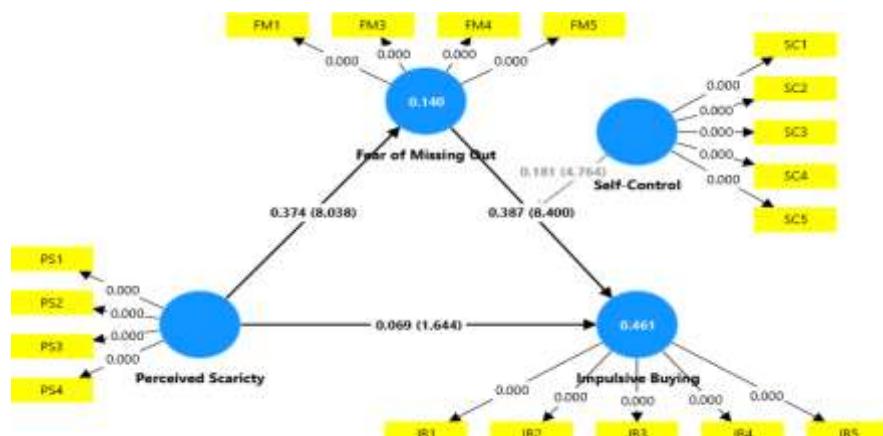


Figure 2. The SEM test results of impulsive buying behaviour, influenced by perceived scarcity and fear of missing out (FOMO), with self-control as a moderating factor

The next step examines the path coefficients to determine the strength, direction, and significance of each relationship. Table 4 presents the results, indicating which hypotheses are supported within the model. The structural model confirms the hypothesized effects. Perceived scarcity significantly affects fear of missing out (FOMO) ($\beta = 0.374$, $t = 8.038$, $p = 0.000$), indicating that higher scarcity perception increases FOMO. FOMO, in turn, significantly affects impulsive buying ($\beta = 0.387$, $t = 8.400$, $p = 0.000$), suggesting that individuals experiencing greater FOMO are more likely to make impulsive purchases. However, the direct effect of perceived scarcity on impulsive buying is not significant ($\beta = 0.069$, $t = 1.644$, $p = 0.100$), implying that scarcity alone does not directly drive impulsive buying.

Table 4. Path coefficient of the direct effect between variables

Hypothesis	Original sample (O)	Sample mean (M)	STDEV	t-statistics	P-values	Result
Perceived Scarcity → Fear of Missing Out (FOMO)	0.374	0.377	0.047	8.038	0.000*	Supported
Perceived Scarcity → Impulsive Buying	0.069	0.068	0.042	1.644	0.100	Not Supported
Fear of Missing Out (FOMO) → Impulsive Buying	0.387	0.388	0.046	8.400	0.000*	Supported

Note: *significant at 5%

The R-Square (R^2) values in SEM-PLS indicate the extent to which the independent latent variables reflect the variance of the dependent latent variables. The analysis shows that the R^2 value for FOMO is 0.140, indicating a weak influence, as the independent variables account for only 14% of its variance. In contrast, the R^2 value for impulsive buying is 0.461, which falls into the moderate category, meaning that the model explains 46.1% of the variance in impulsive buying behaviour, while other external factors influence the remainder. These findings suggest that the model provides a stronger explanatory power for impulsive buying behaviour than for FOMO.

Table 5 presents the results of the mediation analysis using bootstrapping in Smart-PLS, confirming that fear of missing out (FOMO) significantly mediates the effect of perceived scarcity on impulsive buying ($\beta = 0.145$, $t = 5.838$, $p = 0.000$), indicating full mediation. The direct effect of perceived scarcity on impulsive buying is not significant ($\beta = 0.069$, $t = 1.644$, $p = 0.100$), indicating that scarcity alone does not strongly drive impulsive buying in the absence of FOMO. However, the significant indirect path through FOMO demonstrates that perceived scarcity influences impulsive buying primarily by increasing FOMO.

Table 5. Path coefficient of the indirect effect between variables

Hypothesis	Original sample (O)	Sample mean (M)	STDEV	t-statistics	P-values	Result
Perceived Scarcity → FOMO → Impulsive Buying	0.145	0.146	0.025	5.838	0.000*	Supported

Note: *significant at 5%

Table 6 presents the moderation analysis, confirming that self-control significantly influences the relationship between fear of missing out (FOMO) and impulsive buying ($\beta = 0.181$, $t = 4.764$, $p = 0.000$). The findings indicate that self-control weakens this relationship, as the direct impact of FOMO on impulsive buying ($\beta = 0.387$) decreases

when the interaction term is included ($\beta = 0.181$). This indicates that individuals with greater self-control are more capable of regulating their impulsive tendencies despite experiencing FOMO, whereas those with lower self-control are more prone to impulsive purchases of K-Pop items driven by emotional pressure associated with FOMO.

Table 6. Path coefficient of the moderating effect of self-control

Hypothesis	Original sample (O)	Sample mean (M)	STDEV	t-statistics	P-values	Result
Self-Control x Fear of Missing Out (FOMO) → Impulsive Buying	0.181	0.182	0.038	4.764	0.000*	Supported

Note: *significant at 5%

6. Discussion

6.1 The Effect of Perceived Scarcity on Fear of Missing Out (FOMO)

This study highlights that perceived scarcity significantly and positively impacts fear of missing out (FOMO) in the context of purchasing K-pop merchandise. Perceived scarcity refers to fans' awareness of limited stock or time constraints, which compels them to act quickly. The survey responses confirm that K-pop fans experience a strong sense of urgency, particularly regarding limited-edition or exclusive items, increasing their likelihood of making immediate purchases to avoid missing out.

From the perspective of Stimulus-Organism-Response (S-O-R) theory, perceived scarcity serves as the stimulus (S) that triggers an emotional response (organism (O)), increasing anxiety and the fear of missing out. These findings align with the study by Patel et al. (2024), Cengiz and Şenel (2024), and Dahmiri et al. (2023), which confirm that perceived scarcity intensifies FOMO and accelerates purchasing decisions. The statistical analysis reinforces this relationship, as indicated by a significant path coefficient and p-value. Therefore, the first hypothesis stating that perceived scarcity significantly affects FOMO is accepted. This study underlines the role of perceived scarcity significantly enhances FOMO, especially with K-pop merchandise purchases.

6.2 The Effect of Perceived Scarcity on Impulsive Buying

The findings indicate that perceived scarcity does not directly and significantly influence impulsive buying in the context of K-pop merchandise. Although the relationship is positive, the effect is weak and statistically insignificant. In other words, the mere perception of scarcity does not automatically drive fans to make impulsive purchases. Therefore, the second hypothesis stating that perceived scarcity has a significant effect on impulsive buying is rejected. This result contrasts with previous studies by Gupta and Gentry (2019), Zhang et al. (2022), and Hao and Huang (2024) research, which reported that product scarcity can increase impulse buying. However, within the Stimulus-Organism-Response (S-O-R) framework, the findings suggest that product scarcity (stimulus) alone is insufficient to directly trigger an impulsive buying response.

This explanation is further supported by the finding that perceived scarcity significantly influences FOMO, leading to impulsive buying. Thus, although scarcity positively correlates with impulsive buying, its direct effect is not sufficiently strong. This suggests that the K-pop fans in this study tend to be more selective in their purchasing decisions, considering other factors such as price, necessity, and product exclusivity before making a decision.

6.3 The Effect of Fear of Missing Out (FOMO) on Impulsive Buying

The analysis results reveal that fear of missing out (FOMO) has a strong and significant impact on impulsive buying behaviour regarding K-pop merchandise. In other words, the greater the fans fear of missing the chance to own exclusive K-pop items, the more likely they will make unplanned purchases. Fans experiencing FOMO often feel anxious and pressured, concerned about losing the opportunity to get their desired merchandise. Therefore, the third hypothesis stating that FOMO significantly affects impulsive buying is accepted.

These findings align with prior research by Maharani et al. (2024) and Çelik et al. (2019), both of which highlight FOMO as a key driver of impulsive buying. When consumers perceive a risk of missing out, they tend to act hastily—often without thorough deliberation—to avoid subsequent regret. This tendency is evident in one of the FOMO indicators measured in this study, which reveals that K-pop fans often feel tempted to buy merchandise to stay current with fandom trends. Overall, the study highlights FOMO as a crucial determinant influencing impulsive buying behaviour among K-pop fans.

6.4 The Effect of Perceived Scarcity on Impulsive Buying Mediated by Fear of Missing Out (FOMO)

FOMO serves as the key link between perceived scarcity and impulsive buying, transforming perceived scarcity into a psychological response that drives impulsive buying. K-pop fans buy rare merchandise out of fear of missing a unique opportunity, especially feeling pressure to buy limited-edition products promoted on social media. These findings suggest that scarcity-based marketing techniques incorporating FOMO-inducing components, such as exclusive specials or limited stock notifications, are better. Consistent with Zhang et al. (2020), Dahmiri et al. (2023), and Cengiz and Şenel (2024), this study confirms that FOMO mediates the relationship between perceived scarcity and impulsive buying. Therefore, the fourth hypothesis, proposing FOMO as a mediator, is accepted.

6.5 The Effect of Fear of Missing Out (FOMO) on Impulsive Buying moderated by Self-Control

Self-control moderates the relationship between fear of missing out (FOMO) and impulsive buying, exhibiting a significant buffering effect. Individuals with higher self-control can resist impulsive urges despite experiencing FOMO, while those with low self-control are more susceptible to making impulsive purchases driven by emotional pressure. From the S-O-R framework, self-control serves as a regulatory mechanism determining whether FOMO leads to impulsive buying or more deliberate decision-making. This finding aligns with Sun et al. (2024), which highlights that self-control helps individuals regulate impulsive consumption caused by external pressures, including emotional factors. Consequently, although FOMO can strongly motivate impulsive purchases, individuals with high self-control can effectively regulate these urges, thereby reducing their susceptibility to impulsive buying despite experiencing FOMO. These findings support the fifth hypothesis that Self-Control significantly moderates the relationship between fear of missing out (FOMO) and impulsive buying.

6.6 Managerial Implications

This study's findings hold important implications for the K-Pop merchandise industry, entertainment agencies, and marketers. Scarcity-based marketing strategies work best when mediated by FOMO, highlighting the utility of tactics such as pre-orders, limited

stock releases, and exclusive merchandise effective in creating a sense of urgency. Social media plays a key role in amplifying FOMO; therefore, digital strategies should leverage fan testimonials, unboxing videos, and idol interactions. To mitigate impulsive buying, flexible payment options and consumer education can be implemented. Loyalty programs offering exclusive access and discounts help strengthen long-term customer relationships. An ethical, community-driven approach fosters a positive shopping experience and enhances brand loyalty.

6.7 Theoretical Contribution

This study contributes to the Stimulus-Organism-Response (S-O-R) theory by demonstrating that perceived scarcity alone does not directly trigger impulsive buying, but rather requires an emotional mechanism, such as the fear of missing out (FOMO), as a mediator. This challenges previous studies suggesting a direct effect, highlighting that scarcity (stimulus) influences purchasing behaviour only when processed through psychological factors (organism), such as FOMO. Additionally, this study introduces self-control as a moderating factor that weakens the effect of FOMO on impulsive buying, addressing a theoretical gap in the S-O-R framework. The findings emphasize the role of individual self-regulation in scarcity-driven purchasing decisions, particularly in fandom-based consumption. By integrating perceived scarcity, FOMO, and self-control, this study offers a more comprehensive knowledge of consumer behavior in impulse-driven markets.

6.8 Limitations

This study has several limitations. The sample of 358 respondents may not fully represent a broad spectrum of K-pop fans. Additionally, the use of purposive sampling through online questionnaires introduces potential bias, as it primarily captures responses from individuals active on social media. Moreover, the respondent pool is predominantly female and aged 21-25, which may limit the generalizability of the findings. The use of closed-ended questionnaires restricts response variety and depth, potentially overlooking nuanced perspectives. Furthermore, external factors such as peer influence, K-pop agency marketing strategies, and emotional regulation were not considered, presenting opportunities for further research.

7. Conclusions

This study found that perceived scarcity has a positive and significant effect on fear of missing out (FOMO), indicating that when K-pop merchandise is perceived as scarce, fans experience increased anxiety about missing the opportunity to obtain it. Furthermore, FOMO has a positive and significant impact on impulsive buying, meaning that the stronger the FOMO, the greater the likelihood of impulse purchases. However, perceived scarcity does not directly impact impulsive buying, despite a positive directional relationship. The impact of perceived scarcity on impulsive buying is fully mediated by FOMO, confirming that scarcity prompts impulsive buying only when accompanied by FOMO. Additionally, self-control serves as a moderating variable that weakens the effect of FOMO on impulsive buying, suggesting that individuals with greater self-control are better able to regulate impulsive urges despite experiencing FOMO. These results underscore the essential role of FOMO in converting perceived scarcity into impulsive buying behaviour and highlight self-control as a protective factor against impulsive consumption.

8. Recommendation

Considering the limitations of this study, several recommendations can be proposed for future research to improve the understanding of consumer behaviour regarding K-Pop merchandise purchases. Future research should expand the sample size and include more diverse demographics to improve generalizability. Employing stratified or random sampling techniques may help reduce bias and provide a more representative view of the K-Pop fan population. Moreover, qualitative approaches such as interviews or focus groups could offer deeper insights into the psychological factors behind impulsive buying, addressing the limitations of closed-ended survey questions. Further studies should explore external influences, including peer influence, K-Pop marketing strategies, and emotional regulation, to develop a more comprehensive model of consumer behaviour. Lastly, cross-cultural comparisons could examine whether the influence of perceived scarcity, FOMO, and self-control on impulsive buying are consistent across different cultural contexts.

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