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Relationships between FoMO, Flow, and Impulse Purchase: Focusing on TikTok Social-commerce Platform

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Abstract

Purpose: The current study investigates the variables influencing FoMO (Fear of Missing Out) and how FoMO affects flow experience and impulse purchases among Vietnamese Generation Z on TikTok, a short-form video social-commerce platform. **Research design, data, and methodology:** After developing operation definitions and measurement scales of each construct based on prior study, the research evaluated the direct and indirect effects among research variables by performing Structural Equation Modeling analysis on the program IBM SPSS AMOS 20 using data of 298 respondents obtained from an online survey by convenience sampling method. **Results:** Findings show that the three factors - covert narcissism, social comparison and scarcity - positively affect FoMO. Flow experience significantly influences impulse purchase, whereas FoMO does not directly predict impulse purchase. However, FoMO does positively affect impulse purchase under the mediating effect of flow experience. **Conclusions:** By highlighting factors affecting FoMO and clarifying the relationship between FoMO, flow experience, and impulse purchase, this research provides helpful insights into the theoretical underpinnings of FoMO and offers marketers practical suggestions to carry out successful marketing campaigns on video social-commerce platforms.

Keywords: FoMO, Short-form Video, Social-commerce, TikTok, Impulse Purchase

JEL Classification Code: D91, M30, M31.

1. Introduction

Social-commerce has transferred the ways people had originally shopped. It makes it possible for customers to interact with a wide range of brands, order goods from long distances, and conveniently have them delivered to their homes. Global e-commerce retail sales were estimated to have reached over \$5 trillion in 2021 and predicted to reach \$7 trillion by the year 2025 (Statista, 2023a). In recent years, live video shopping is a new trend that emerged on social-commerce and online shopping platforms, in which

influencers showcase the goods, interact with the audiences, and allow them to purchase the products in real time.

Starting as a short-form video sharing platform in 2016, TikTok has evolved into an enormous social-commerce ecosystem with the TikTok Shop feature, a comprehensive in-app experience for creators and merchants to advertise and sell their goods. TikTok Shop enables customers to make direct purchases while watching live streaming videos and in-feed videos, as well as through brand or creator accounts. With 240 million users, Southeast Asia is the region with the most TikTok users worldwide (Bangkok

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Post, 2022). Vietnam is the second largest TikTok market in the Asia-Pacific region with 50 million users out of a total population of 100 million as of 2023 (Statista, 2023b). In the meantime, the retail social-commerce market in Vietnam was estimated by the Ministry of Industry and Trade to be worth \$16.4 billion in 2022, with TikTok occupying the third spot in terms of market share (Tien Phong News, 2023). In the fourth quarter of 2022, around 67% of Generation Z (Gen Z) in Vietnam were currently using TikTok platform (Statista, 2023c). Gen Z TikTok users are 1.3 times more likely than users of other social media platforms to have bought a product on TikTok because it was trending, and 1.4 times more probable than other platform users to explore new brands and products on this application (TikTok for Business, 2023).

In recent studies, the concept of FoMO (Fear of missing out) has been receiving a lot of attention. FoMO is regarded as a "digital disease" that emerges in the age of technology (Betoncu & Ozdamli, 2019). Vietnamese Generation Z experiences high levels of FoMO since they were born during a time of rapid change in the nation, which included an economic boom along with the development of technology and the Internet. To be immediately updated on the information of others, people with high levels FoMO frequently turn to social media (Przybylski et al., 2013). Therefore, several studies have been made to evaluate the relationship between FoMO and social media usage (Casale et al., 2018; Fioravanti et al., 2021; Franchina et al., 2018; Swan & Kendall, 2016). In recent years, short-form video has become an increasingly popular form of contents. Together with the rise of TikTok, traditional social media platforms such as Facebook, Instagram, Youtube, etc. have integrated short-form video as a separated content category into users' newsfeeds. Therefore, the knowledge on the association between FoMO and customer using behaviour when consuming short-form videos is of great importance. However, there has been a lack of studies conducted to evaluate this relationship. Besides, FoMO is defined as a powerful purchase trigger in marketing (Hodkinson, 2019). Therefore, commercial sectors have successfully utilized the idea of FoMO to entice customers to make purchases. The term "commercial FoMO marketing appeal" refers to strategies that appeal to people's inner fear of missing out on a consumption activity that friends or family members enjoy (Good & Hyman, 2020).

Therefore, this research aims to investigate the factors effecting FoMO level of Vietnamese Generation Z, as well as the relationship among FoMO, flow experience and impulse purchase on TikTok – a growing popular short-form video social-commerce platform in Southeast Asia.

2. Literature Review and Hypotheses

2.1. FoMO (Fear of missing out)

FoMO is defined as the sensation of missing out on knowledge, occasions, experiences, or life choices that may improve one's life. FoMO results in compulsive worrying about being left out of social interactions, as well as anxiety, loneliness, and a sense of relative deprivation that one might not be able to keep up with the rewarding opportunities of others (Abel et al., 2016). The psychological traits of isolation anxiety and a desire for belonging best describe FoMO (Kang et al., 2019). Intense desire for social connections, including the need to identify with one's status and the need for approval or praise from others, are all characteristics of the fundamental human motivation known as a desire for belonging. Isolation anxiety is described as the fear of being overlooked or left out of the majority group.

Przybylski et al. (2013) asserted that the recent emergence of FoMO is due to people's ability to communicate with one another through social media. Those with higher FoMO levels feel more pressure to constantly stay up to date on what others are doing, thereby motivated to use social media more frequently. Numerous studies have successfully demonstrated the association between FoMO and social media usage (Alt, 2015; Franchina et al., 2018; Roberts & David, 2020). "Fomsumerism" is a term developed by Argan and Tokay-Argan (2018) to describe the rise of "FoMO-based consumption". A fomsumer is described as someone who tends to consume because they are afraid of missing out on something. The factors influencing FoMO have been the subject of several studies in the field of psychology (Dou et al., 2023; Reer et al., 2019; Servidio et al., 2021; Xie et al., 2018; Zhang et al., 2022). This research investigates four factors affecting FoMO, including social comparison, relatedness, covert narcissism, and scarcity.

2.2. Factors Affecting FoMO

2.2.1. Social Comparison

The theory of social comparison states that people assess their own convictions and abilities by comparing them with those of others. People use social comparison to better understand themselves and their surrounding environment, improve their self-evaluations, and regulate their emotions (Festinger, 1954). People naturally tend to evaluate every quality or value they possess in relation to others' (Kruglanski & Mayseless, 1990). People are more likely to engage in social comparison when they are uncertain or unclear about their self-concept or the situation at hand. Social comparison can be used as a method for developing

social identities, self-improvement, and self-evaluation. Despite the positive emotions that can be gained through social comparison, those who have a high tendency for comparison on social media are more likely to feel unhappy in their lives and to suffer from psychological distress because of negative emotions like depression and anxiety (Liu et al., 2017). FoMO, on the other hand, is a form of anxiety that is comparable to the anxiety brought on by social comparison. Reagle (2015) defined FoMO as the unfavourable emotional state brought on by anxiety related to envy, in which people start evaluating their current well-being in relation to that of others. By comparing themselves those around them, those with FoMO worry they may miss something important or rewarding and are unsure of what they might be missing out on. To achieve self-evaluation and a sense of identity, people have a natural tendency to compare themselves to a reference group. With the development of technology, it has become simple for anyone to be real time informed of others, including the wonderful experiences that people share about themselves, which in turn promotes the fear of missing out. From the above discussion, the following hypothesis can be established:

H1: Social comparison positively affects FoMO.

2.2.2. Relatedness

Self-Determination Theory (SDT), which was first proposed by Deci and Ryan (1980), is a theory about human motivation and personality development that focuses on people's innate propensity for growth and psychological needs. The three basic psychological needs of human are autonomy, competence, and relatedness. When these basic needs are met, autonomous motivational states and intrinsic aspirations are encouraged, which support psychological well-being and effective interaction with the outside world (Deci & Ryan, 2015). Relatedness, the third psychological need that influences intrinsic motivation, is the willingness to interact with, connect to, and care for others. When one feels connected to others and can develop meaningful relationships with them, their need for relatedness is satisfied.

In a variety of contexts, including education (Deci et al., 1996; Paloş et al., 2020), sport (Gillet & Rosnet, 2008; Hagger & Chatzisarantis, 2007), and video-gaming (Ryan et al., 2006), basis need satisfaction is strongly associated with proactive behavioral self-regulation. Thereby, FoMO can be understood as self-regulatory limbo brought on situational or continuous deficits in psychological need satisfactions (Przybylski et al., 2013). Relatedness, one of the three fundamental psychological needs, may have the strongest connection to FoMO because both the need for belonging and the concept of relatedness share a desire to be taken care

of and connected to others. In light of these factors, it is anticipated that the degree to which one's need for relatedness satisfaction will lower his level of FoMO, from which the following hypothesis can be deduced:

H2: Relatedness negatively affects FoMO.

2.2.3. Covert Narcissism

The topic of narcissism has been widely discussed by many academics in psychology field (Akhtar & Thomson, 1982; Rathvon & Holmstrom, 1996; Wink, 1991). Narcissism is characterized by self-centeredness, a sense of privilege, grandiose imaginations, and exploitative interpersonal relationships. There are two types of narcissism: overt and covert (Wink, 1991). Overt narcissism is defined as an excessive need for attention and an inflated self-importance. The covert form, like the overt form, includes grandiosity; however, it is accompanied by hypersensitivity to criticism, a lack of self-confidence, and social withdrawal.

Covert narcissists are shy, uneasy in the presence of other people's attention, easily hurt by trivial issues, and inclined to feel shameful. Since covert narcissists are less able to regulate their self-esteem, they frequently rely on external feedback from others to manage it. Covert narcissistic characters demand that others respond favourably to them and admire them, regardless of their behaviours, beliefs, skills, or social standing, but they are concerned that others will fail to respond to them with the narcissistic supplies they require. Conflicts over expectations and disappointment are common, resulting in anger, shame, and depression. As a result, covert narcissists experience social anxiety and have difficulty forming relationships. (Dickinson & Pincus, 2003).

Covert narcissism is identified by high rejection sensitivity (Park et al., 2022) and vulnerability to criticism of others (Rhodewalt & Morf, 1995). Covert narcissists have high levels of attachment anxiety (i.e., the fear of being abandoned or separated from a loved one, including parents, friends, and spouses). FoMO also includes the trait of social anxiety, which manifests as shyness in interpersonal relationships and anxiety when using social media platforms (Abel et al., 2016). As a result, it can be predicted that covert narcissism can positively influence FoMO, and the following hypothesis can be drawn:

H3: Covert narcissism positively affects FoMO.

2.2.4. Scarcity

Scarcity is defined as a product's insufficient supply or a short period of accessibility (Brock, 1968; Lynn, 1989). Based on Brock's (1968) commodity theory, any good meets

the criterion "will be valued to the extent that it is unavailable". When a product is in short supply, people perceive its value to be higher than when it is easily accessible. As defined by Wu et al. (2012), perceived scarcity is the perception of scarce commodities due to a quantity or time limit that results in a limited supply. The scarcity effect is a key social influence principle that marketers use to increase the subjective attractiveness of their products (Jung & Kellaris, 2004). Many studies have been conducted to investigate the "scarcity effect", which occurs when people place a higher value on a limited object and a lower value on one that is widely accessible in the market (Gierl et al., 2008; Lynn, 1992; Snyder, 1992; Zhang et al., 2022).

Product scarcity messages frequently force consumers to choose between buying now or risk missing out on a purchase opportunity (Shi et al., 2020). Individuals may experience FoMO as a result of scarcity marketing appeals (Hodkinson, 2019). Hodkinson (2019) stated that the themes of opportunity, limited supply, or scarcity, and the need to make decisions all exist in these FoMO experiences. Therefore, perceived scarcity can trigger FoMO by reminding people of potential opportunities that will be missed if they fail to act quickly. Conformity theory (Jones, 1984) can also explain the relationship between scarcity and FoMO. Conformity theory indicates the way people conform their attitudes, beliefs, and behaviours to group norms. As discussed by Shi et al. (2020), people with a higher need for conformity put a greater value on a product when more people are buying it, as demonstrated by its unavailability. As a result, it can be anticipated that perceived scarcity of certain commodities will elicit people's need for conformity, resulting in FoMO. From the above discussions, the following hypothesis can be formulated:

H4: Scarcity positively affects FoMO.

2.3. Flow Experience on TikTok

Csikszentmihalyi (1974) defined flow as the optimal experience obtained from an intrinsically motivated act. The flow experience refers to people's emotions when they are completely immersed in an activity (Csikszentmihalyi, 1990). Flow has been used in a variety of industries, including social media use. Prior flow theory research has shown that the technological characteristics of information technology services have a major effect on the development of flow (Finneran & Zhang, 2005; Kwak et al., 2014). The platform's provision of entertainment, escape from reality, information values, and social interaction can consistently induce the optimal satisfactory condition, perceived enjoyment, and flow experience when using mobile social media (Gong et al., 2020; Kim et al., 2013; Kwak et al.,

2014). Social media users experience flow when they immerse themselves in navigating the platform and lose track of time (Kwak et al., 2014).

Uses and Gratification theory (UGT) stated that media consumers are rational actors who employ it to address specific needs (Katz et al., 1973). When those needs are satisfied, the subsequent pleasures influence people's perceptions of technologies and motivate them to use them again (Castañeda et al., 2007). Social interaction, recreation, self-satisfaction, and information seeking are listed as the four main reasons people use social media. Prior research has discovered the positive association between usage motivations and flow experience on social media (Guo et al., 2016; Huang et al., 2014; Miranda et al., 2023). To meet their needs for social interaction and information searching, people with FoMO frequently turn to social media. Social interaction and information seeking motivation were found to positively influence flow state on social media. Since using social media platforms gives users constant access to information about the lives of others and the feeling of being a part of their online community, FoMO may increase flow experience on social media. Therefore, the hypothesis can be derived as follows:

H5: FoMO positively affects TikTok flow.

2.4. Impulse Purchase

Piron (1991) defined impulse buying as an unplanned purchase made immediately after seeing the product or the stimulus that represents it. Previous research has investigated the relationship between FoMO and impulse purchases (Çelik et al., 2019; Ögel, 2022; Zhang et al., 2022). Drive-reduction theory can shed light on the relationship between FoMO and impulsive purchasing behavior. The concept of homeostasis, which states that the body actively strives to maintain a specific state of balance or equilibrium, is central to drive-reduction theory (Hull, 1943). All motivation stems from psychological or biological needs. Humans and animals seek ways to meet these needs to reduce tension and return to a state of equilibrium. Drive-reduction theory demonstrates the significant link between drive and behavior, in which people are more likely to act quickly to relieve tension. Therefore, people who suffer from FoMO seek ways to mitigate the tension which resulted in by the compulsive anxiety and negative feelings that they are experiencing. They may take prompt actions that can provide them with more social engagement and opportunities to participate in the same rewarding activities as others. Those with high levels of FoMO can thus make frequent impulse purchases. The following hypothesis can be derived from the preceding discussion:

H6: FoMO positively affects impulse purchase.

People who suffer from FoMO are more likely to be drawn to social media platforms because they see them as useful tools for strengthening their connectedness (Przybylski et al., 2013). TikTok, like other social media platforms, has been used as a powerful tool for marketing communication by businesses and brands. TikTok users are frequently bombarded with marketing stimuli such as posts from influencers, product reviews, and advertisements, increasing the likelihood that they will make impulsive purchases. Previous research has also discovered that flow experience mediates the causal relationship between social media usage motivation and impulsive purchasing (Shahpasandi et al., 2020). Following this line of thought, flow experience while using TikTok may act as a mediator in the relationship between FoMO and impulsive purchasing behavior. We can deduce two hypotheses from the preceding discussions:

H7: TikTok flow positively affects impulse purchase.

H8: TikTok flow mediates the relationship between FoMO and impulse purchase.

The research model is proposed as Figure 1.

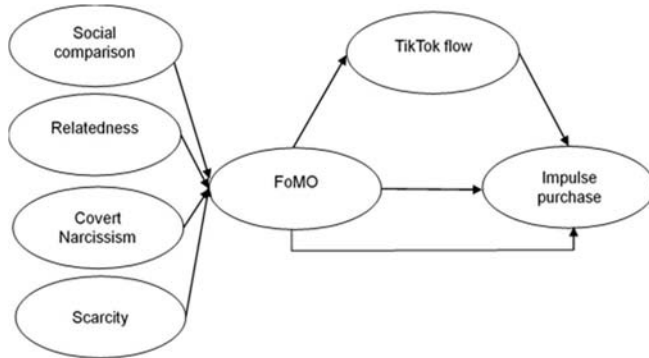


Figure 1: Research Model

3. Methodology

3.1. Construct Measurement

To measure the outcomes of this study, operational definitions of each construct were created, and measurement items were then developed based on prior research findings. There were 27 items created for seven constructs, using a seven-point Likert scale (ranging from 1 to 7, with 1 being "very strongly disagree" and 7 being "very strongly agree").

Table 1 shows the operational definitions and measurement items for each construct.

Table 1: Construct measurements

Construct	Item	Reference
TikTok flow	Experience great joy. Lose track of time. Indulge imagination and curiosity.	Kwak et al. (2014)
Impulse purchase	Experience a sudden urge to buy. Buy the products spontaneously. Buy the products without careful thinking.	Beatty & Ferrell (1998), Rook & Fisher (1995)
FoMO	Get bothered if missed out on a planned get-together. Spend much time keeping up with what is going on. Get anxious when not knowing what friends are up to. Fear others have more rewarding experiences.	Przybylski et al. (2013)
Social comparison	Pay attention to how others do things. Compare doing socially with other people. Like to know what others would do. Find out what others think.	Schneider & Schupp (2011)
Relatedness	Feel connected with people. Experience warm feelings with people. Cared by people.	Chen et al. (2015)
Covert narcissism	Want to be acknowledged by others. Feel inferior. Anger because of defeat or disappointment. Avoid rejection. Dislike being with a group if not appreciated. Wonder why other people aren't more appreciative of my good qualities. Sensitive to success and failure.	Cheek, Hendin, Wink (2013)
Scarcity	Small in quantity. Likely to be sold out soon. Unable to buy in the future.	Wu et al. (2012)

3.2. Data Collection and Analysis

A convenience sampling method was used to collect data. An online survey was conducted using a Google form sent out via Facebook from April 3 to April 7, 2023. The survey participants were Vietnamese Generation Z born between 1997 and 2012 who were currently using the TikTok platform. After removing unqualified responses, 298 were used for Structural Equation Modeling analysis on the IBM SPSS AMOS 20 program. The sample's demographic characteristics are presented below.

Table 2: Demographic characteristic of sample

Item	Characteristics	Frequency	Ratio
Gender	Male	61	20.5
	Female	237	79.5
Education level	Secondary school	18	6.0
	High school	38	12.8
	University	215	72.1
	Master/PhD	27	9.1
Occupation	Student	183	61.4
	Worker	115	38.6
Average income per month	< 5 million VND (< USD 212)	161	54.0
	5 million VND - 10 million VND (USD 212 – USD 424)	52	17.5
	10 million VND - 20 million VND (USD 424 – USD 847)	71	23.8
	20 million VND - 30 million VND (USD 847 – USD 1271)	13	4.4
	> 30 million VND (> USD 1271)	1	.3
Tiktok average usage time per day	Less than 1 hour	119	39.9
	From 1 hour to 3 hours	129	43.3
	From 3 hours to 5 hours	35	11.8
	More than 5 hours	15	5.0

4. Results

4.1. Reliability and Validity Test

Firstly, all measurement scales in this study scored Cronbach’s Alpha greater than .8: Covert narcissism (.909), Relatedness (.897), Social comparison (.829), Scarcity (.852), Impulse purchase (.911), TikTok flow (.854), FoMO (.808). Therefore, the measurement model’s reliability requirement is met (Nunnally, 1978). The variables were then reduced in dimension by grouping them into a few factors using Exploratory factor analysis (EFA). EFA was carried out separately in the two groups: independent variables and dependent variables, using Principal Component Analysis method with Varimax rotation. The KMO value was .899 and Bartlett’s test of independent variable group was statistically significant (sig<.001). The total of 17 variables were classified into 4 groups with initial eigenvalues of 1.257. Similarly, Bartlett’s test of the dependent variable group also had a statistically significant result (sig<.001) and a KMO value of .841 was obtained. 3 groups were generated with initial eigenvalues of 1.157. Table 3 summarizes Cronbach’s Alpha test and EFA test results.

Table 3: Cronbach’s Alpha test and EFA test result

Construct and items		Factor loading							α
Construct	Items	1	2	3	4	5	6	7	
Covert narcissism (NAR)	NAR5	.791							.909
	NAR2	.789							
	NAR6	.778							
	NAR3	.749							
	NAR4	.739							
	NAR1	.726							
	NAR7	.713							
Related-ness (REL)	REL2		.867						.897
	REL1		.854						
	REL3		.845						
Social comparison (SCO)	SCO3			.824					.829
	SCO2			.742					
	SCO1			.729					
	SCO4			.671					
Scarcity (SCA)	SCA1				.888				.852
	SCA2				.866				
	SCA3				.841				
Impulse purchase (IMP)	IMP2					.901			.911
	IMP3					.887			
	IMP1					.793			
TikTok flow (FLO)	FLO1						.845		.854
	FLO3						.820		
	FLO2						.736		
FoMO (FOM)	FOM3							.831	.808
	FOM4							.815	
	FOM2							.694	
	FOM1							.618	

Confirmatory factor analysis (CFA) was used to assess the quality of the constructs using the two indicators of convergent validity and discriminant validity. The table below shows factor loading, extracted average variance (AVE), and composite reliability (C.R). As shown in Table 4, all indicators of each latent variable reported factor loadings greater than .6, AVE values ranging from .525 to .784, and all C.R values greater than .7, indicating that all constructs had convergent validity.

Table 4: Convergent validity of CFA

Construct	Measure	Factor loading (>.6)	AVE (>.5)	Composite reliability (>.7)
Covert narcissism	NAR1	.758	.593	.910
	NAR2	.801		
	NAR3	.822		
	NAR4	.711		
	NAR5	.812		
	NAR6	.792		
	NAR7	.684		

Construct	Measure	Factor loading (>.6)	AVE (>.5)	Composite reliability (>.7)
Relatedness	REL1	.882	.747	.898
	REL2	.911		
	REL3	.796		
Social comparison	SCO1	.723	.556	.833
	SCO2	.699		
	SCO3	.811		
	SCO4	.744		
Scarcity	SCA1	.860	.666	.856
	SCA2	.864		
	SCA3	.716		
FoMO	FOM1	.639	.525	.814
	FOM2	.735		
	FOM3	.792		
	FOM4	.723		
TikTok flow	FLO1	.837	.674	.861
	FLO2	.754		
	FLO3	.867		
Impulse purchase	IMP1	.844	.784	.916
	IMP2	.938		
	IMP3	.872		

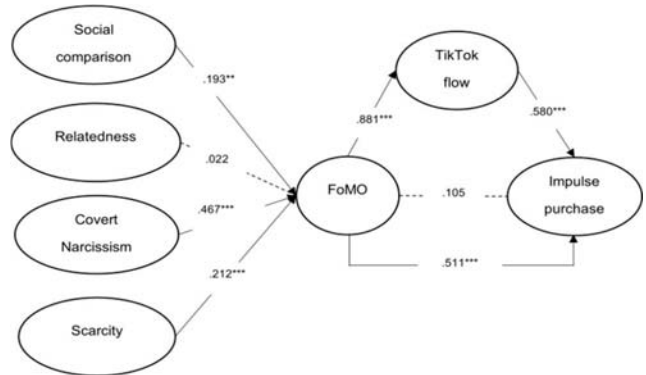
Discriminant validity exists when the variance between a construct and any other construct is less than the variance between the construct and its indicators. This is determined by comparing a construct's AVE square root to the correlations that link that construct to other constructs. As shown in Table 5, the square root of AVE for each construct was greater than the inter-construct correlations, indicating that there were no discriminant validity issues.

Table 5: Discriminant validity of CFA

	SCA	NAR	REL	SCO	FOM	FLO	IMP
SCA	.816						
NAR	.279	.770					
REL	.186	.538	.864				
SCO	.281	.670	.567	.745			
FOM	.428	.685	.360	.558	.724		
FLO	.389	.620	.406	.520	.609	.821	
IMP	.564	.301	.075	.234	.477	.589	.886

4.2. Hypotheses Test

Four indicators IFI (.920), TLI (.909), CFI (.920), and RMSEA (.067) scored acceptable values in the Structural equation modeling (SEM) test, supporting the assertion that the structural equation modeling method fit the data well. The Structural equation modeling performed to examine the research model used a 4000-sample bootstrapping method with a confidence level of 95%. Figure 2 depicts the results of the full structured model with standardized parameters.



Note: ***p<.001, **p<.01

Figure 2: Estimated model

As can be seen in Table 6 below, except for relatedness, all remaining factors - covert narcissism, social comparison, and scarcity - significantly and positively affected FoMO. H3 was supported by the significant association between covert narcissism and FoMO ($\beta=.467, p<.001$). Additionally, social comparison significantly influenced FoMO level ($\beta=.193, p<.05$), thus supporting H1. Greater scarcity generated a higher level of FoMO ($\beta=.212, p<.001$), so H4 was approved. On the other hand, there was no statistically significant correlation between relatedness and FoMO ($p=.677$). H2 was therefore rejected. Higher FoMO level was positively correlated with more intense flow experience on TikTok platform ($\beta=.881, p<.001$), supporting H5. TikTok flow considerably elevated impulse buying ($\beta=.580, p<.001$), which supported H7. However, H6 was disproved as there was no significant correlation between impulse buying and FoMO ($p=.409$).

Table 6: Direct effect results

Path	Estimate	S.E	C.R	P-value
NAR → FOM	.467	.071	6.629	***
REL → FOM	.022	.054	.417	.677
SCO → FOM	.193	.072	2.659	.008
SCA → FOM	.212	.046	4.609	***
FOM → FLO	.881	.090	9.761	***
FLO → IMP	.580	.108	5.346	***
FOM → IMP	.105	.127	.826	.409

***p<.001

The results also supported H8 by showing a positive and significant indirect effect of FoMO on impulsive purchase ($\beta=.511, p<.001$). The direct effect of FoMO on impulse purchase was nevertheless found to be insignificant in the presence of TikTok flow ($\beta=.105, p=.409$). As a result, TikTok flow completely mediated the link between impulse buying and FoMO. The results of the indirect effect are summarized in Table 7.

Table 7: Indirect effect results

Path	Indirect effect	Confidence Interval		P-value	Conclusion
FOM → FLO → IMP	.511	Lower bound .319	Upper bound .761	.000	Full mediation

Results of the hypothesis tests are presented in Table 8.

Table 8: Hypothesis test results

Hypothesis	Content	Result
H1	Social comparison positively affects FoMO	Supported
H2	Relatedness negatively affects FoMO	Rejected
H3	Covert narcissism positively affects FoMO	Supported
H4	Scarcity positively affects FoMO	Supported
H5	FoMO positively affects TikTok flow	Supported
H6	FoMO positively affects impulse purchase	Rejected
H7	TikTok flow positively affects impulse purchase	Supported
H8	TikTok flow mediates the relationship between FoMO and impulse purchase	Supported

5. Conclusions

5.1. Findings and Implications

The purpose of this study was to examine the effects of social comparison, relatedness, covert narcissism, and scarcity on FoMO, as well as the relationship between FoMO, flow experience, and impulse purchase among Vietnamese Generation Z on TikTok platform. The study found significant positive associations between covert narcissism, social comparison, scarcity and FoMO, as well as the full mediation effect of TikTok flow in the relationship between FoMO and impulse purchase. Nevertheless, it was noteworthy that relatedness and FoMO did not appear to be related in any way.

To begin, social comparison had a significant positive effect on FoMO, which was consistent with previous research (Reer et al., 2019; Servidio et al., 2021). With the proliferation of the Internet and social media, it is now possible to easily obtain information about others, including positive information about recent rewarding experiences and activities. As a result, they are more likely to conclude that others are doing better or having more rewarding experiences than they are, leading to a fear of missing out. Second, covert narcissism positively influenced FoMO. This finding supported the hypothesis that covert narcissists have higher levels of FoMO. People with covert narcissistic tendencies have a strong desire for recognition and to be superior to others. They become dissatisfied with their social

relationships and experience negative emotions when they discover they are being left behind or excluded by others. As a result, covert narcissists' high sensitivity to rejection and abandonment, combined with their strong need to be self-centered and recognized, may explain why they develop FoMO. Third, there was a correlation between scarcity and FoMO level, which was in alignment with previous study (Zhang et al., 2022). Scarcity refers to a person's perception of a particular good or service's limited availability or quantity. TikTok users are exposed to a variety of factors that can lead to a scarcity perception, such as product reviews, user comments, and influencer's livestreams. When a person believes that the opportunity to purchase certain products is fading, he is more likely to develop FoMO because scarcity reminds him of the potential opportunities to enjoy positive and beneficial experiences offered by the products that may be missed if a purchase decision is not made right away. The relationship between relatedness and FoMO, on the other hand, was insignificant. Several studies have been conducted to investigate the negative relationship between basic psychological need satisfaction (autonomy, competency, relatedness) and FoMO level (Butt & Arshad, 2021; Dou et al., 2023; Xie et al., 2018). However, in this study, relatedness satisfaction was investigated separately from the other two psychological needs. This study's insignificant result suggests that relatedness satisfaction alone may not be enough to alleviate the fear of missing out. That is, even if the two concepts have similar characteristics, an individual can still experience FoMO while having high level of relatedness satisfaction. More in-depth empirical research into this relationship can be conducted in the future. Higher levels of FoMO were associated with more intense flow experiences while using TikTok, but not with impulse purchases in the presence of TikTok flow. Furthermore, there was a positive and significant indirect effect of FoMO on impulse purchase, which was fully mediated by TikTok flow experience. People with FoMO are more likely to be drawn to social media platforms because they see them as useful tools for strengthening their connections (Przybylski et al., 2013). Because TikTok satisfies such users' strong needs for social interaction and information search, they tend to devote more time and effort to TikTok, resulting in a higher flow experience. Furthermore, impulse purchases follow because of FoMO via the TikTok flow experience. TikTok users are easily exposed to various marketing stimuli such as advertisements, influencer posts, product reviews, and so on, leading to impulsive purchasing decisions.

This study contributes to the theoretical foundation of FoMO and offers businesses with valuable recommendations for conducting successful marketing campaigns on TikTok. First, this is the first study in the

marketing sector to investigate multiple variables that can affect FoMO on short-form video platform. According to the findings, covert narcissism, social comparison, and scarcity are powerful predictors of FoMO. Second, this is the first study to discover a link between FoMO and flow experience on a social media platform. Although the effect of FoMO on social media usage has previously been researched (Casale et al., 2018; Fioravanti et al., 2021; Franchina et al., 2018; Swan & Kendall, 2016), there has been a lack of research examining the potential relationship between FoMO and flow experience on social media platforms. Third, by investigating the mediation effect of TikTok flow experience in the relationship between FoMO and impulse purchase, this study adds to our understanding of the importance of both FoMO and TikTok absorption level in customer purchasing behaviour.

Furthermore, this study offers recommendations for foreign investors and marketers on how to create effective marketing campaigns on TikTok, an increasingly popular video social-commerce platform among Southeast Asian consumers. Because improving TikTok users' flow experience may result in impulsive purchases, brands should concentrate on creating more engaging brand content and employing platform algorithms to allow their videos to appear frequently in users' newsfeeds. Furthermore, since FoMO can forecast social media engagement and purchasing behaviour, brands should target customers' FoMO and factors influencing FoMO. Influencers can increase scarcity perception of customers by communicating scarcity messages such as "buy now or regret later" when introducing products on live stream. Also, encouraging current customers to share positive feedback about products on TikTok can also effectively generate social comparison among potential customers. Furthermore, brands can elicit covert narcissism in customers by emphasizing the products' contribution to the enhancement of the customers' social images, self-centeredness, or sense of belonging.

5.2. Limitations and Future Research

There are some limitations of this study that could be addressed in future research.

First, since the data for this research was collected using convenience sampling via an online Google form in a short period of time, there would be some problem with the representativeness of the sample (e.g., females out weighted males, data mainly focused on southern region of Vietnam, etc.). Sample's weaknesses can be improved in future research by using more effective methods such as quota sampling. Third, while TikTok usage patterns and impulsive purchasing tendencies may differ across cultures, geographic boundaries, and ages, this study focused primarily on Vietnamese Generation Z. Future research can

thus consider differences in nationality, culture as well as generation to make useful comparisons on related topics. Third, all psychological and behavioural variables in this study were measured using questionnaire method. Some participants tend to give positive responses in accordance with social norms or distort responses due to lack of concentration. Furthermore, questionnaires frequently provide limited insight into the complexities of psychological phenomena and may not fully reflect the complexities of real-life situations involving psychological variables. Future studies should use more reliable method such as interview or observation for accurate measurement of these latent variables. Fourth, for some constructs, such as covert narcissism and social comparison, this study used measurement scales from previous international studies and shortened measurement scales. As a result, it will be necessary in the future to develop and validate the accuracy of Vietnamese versions of these constructs.

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