

Herding Behavior and Customer Purchase Intention: Evidence from Southeast Asian Mobile Markets

Lay Hong Tan¹, Zechan Anwar³, Meryl Qin Lei Yan^{2*}, Mohammad Aliff Ashraff Bin Alias², Muhammad Khairul Nizam Bin Abdul Razak², Muhamad Nazirul Amin Bin Mohd Zaid², Muhammad Salman Tasawar³, Aliza Fatima³, Hamza Akram³, Daisy Mui Hung Kee² 

¹Universiti Teknikal Malaysia Melaka, 75450 Ayer Keroh, Melaka, Malaysia

² Universiti Sains Malaysia, Jalan Sg Dua, 11800 Minden, Pulau Pinang, Malaysia

³University of Okara, 2 KM Multan Road, Renala Khurd By Pass, Punjab, Pakistan

*Corresponding Email: merylyan4@gmail.com

ARTICLE INFORMATION

Publication information

Research article

HOW TO CITE

Tan, L. H., Anwar, Z., Yan, M. Q. L., Alias, M. A. A., Razak, M. K. N. A., Zaid, M. N. A. M., ..., & Kee, D. M. H. (2026). Herding behavior and customer purchase intention: Evidence from Southeast Asian mobile markets. *Journal of the Community Development in Asia*, 9(3), 503–521.

DOI:

<https://doi.org/10.32535/jcda.v9i3.5057>

Copyright @ 2026 owned by Author(s).

Published by JCDA



This is an open-access article.

License:

Attribution-Noncommercial-Share Alike
(CC BY-NC-SA)

Received: 15 July 2026

Accepted: 16 August 2026

Published: 19 September 2026

ABSTRACT

This study examines the influence of Herding Behavior on Customer Purchase Intention toward Samsung smartphones in Southeast Asian mobile markets, with Fear of Missing Out (FOMO) and Risk Aversion as mediating variables. A quantitative cross-sectional approach was employed using data collected from 159 respondents through an online questionnaire. Data were analyzed using reliability, correlation, regression, and mediation analyses. The results indicate that Herding Behavior significantly influences Customer Purchase Intention ($\beta = 0.411$, $p < .001$) and FOMO ($\beta = 0.762$, $p < .001$). FOMO ($\beta = 0.223$, $p < .001$) and Risk Aversion ($\beta = 0.351$, $p < .001$) also significantly influence Customer Purchase Intention, with the model explaining 61.7% of its variance ($R^2 = 0.617$). Mediation analysis further reveals significant indirect effects through FOMO ($\beta = 0.247$, $p < .001$) and Risk Aversion ($\beta = 0.068$, $p < .001$). These findings demonstrate that FOMO and Risk Aversion function as parallel mediators, providing insights into the social and psychological mechanisms underlying smartphone Purchase Intention.

Keywords: Consumer behavior; Fear of Missing Out; Herding behavior; Mobile phones; Purchase intention; Risk aversion

INTRODUCTION

In the digital era, consumer purchasing behavior has undergone significant changes, particularly in technology-based industries such as the smartphone market. The rapid growth of social media and e-commerce platforms has shifted consumer decision-making from being primarily driven by individual preferences toward greater reliance on the opinions, recommendations, and behaviors of others in digital environments. Recent studies highlight that Herding Behavior plays an important role in translating social influence into Purchase Intention, particularly in digital environments where online word-of-mouth and credibility cues are prominent (Su et al., 2023). Consequently, consumers may consider the opinions and behaviors of others alongside product attributes when making purchasing decisions. This phenomenon is particularly relevant in the smartphone industry, where rapid technological developments and product complexity can increase uncertainty in consumer decision-making.

One of the prominent social dynamics underlying this phenomenon is Herding Behavior, which refers to individuals' tendency to imitate or follow the behaviors and decisions of others, particularly under conditions of uncertainty. In digital environments, consumers frequently rely on indicators such as product popularity, ratings, reviews, and peer recommendations when making purchasing decisions. Previous research indicates that Herding Behavior significantly influences online consumer decisions, as individuals may rely on product popularity and peer-generated information to guide their purchases (Ali et al., 2024). This behavior is particularly relevant in the smartphone market, where consumers are required to evaluate various technological features, product alternatives, and social information before making purchase decisions.

Herding Behavior has been extensively examined across several disciplines, including economics, finance, psychology, and the social sciences. However, much of the existing research has focused on financial markets, particularly on how investors follow the actions of others when making investment decisions. Consequently, the application of Herding Behavior to marketing and consumer purchasing decisions remains comparatively less explored. This issue has become increasingly relevant in digital purchasing contexts, where consumers frequently rely on reviews, ratings, trends, and the behavior of other consumers when evaluating products. Although Herding Behavior has long been investigated in economics and finance, its role in marketing and online consumer decision-making requires further examination as consumers increasingly depend on social cues and the actions of others in digital environments (Sun et al., 2019).

In addition to social influence, individual differences in risk perception may play an important role in shaping consumer decisions. Risk Aversion refers to an individual's tendency to avoid uncertainty and potential losses when making decisions. In high-involvement purchases such as smartphones, consumers may encounter financial, functional, and social risks. Risk-averse consumers may therefore rely more heavily on external cues, including the behaviors and opinions of others, to reduce uncertainty and increase confidence in their purchasing decisions. Previous research has shown that Risk Aversion is relevant to the relationship between Herding Behavior and Purchase Intention because consumers may rely on social cues when evaluating uncertainty in purchasing decisions (Pham et al., 2023). Accordingly, Risk Aversion is examined in this study as a potential mediating mechanism through which Herding Behavior contributes to Customer Purchase Intention.

Furthermore, psychological factors such as Fear of Missing Out (FOMO) have emerged as important determinants of consumer behavior in digital environments. FOMO refers

to the anxiety or concern that others may be experiencing rewarding events or opportunities without one's participation, creating a strong desire to remain connected and involved. Previous studies suggest that FOMO can significantly influence consumer purchasing behavior by functioning as a psychological response to social stimuli and contributing to impulsive and repeat purchase intentions (Promalessy et al., 2024). In the context of Herding Behavior, observing the purchasing decisions and experiences of others may trigger a fear of being excluded from current trends or opportunities. Consequently, FOMO may function as a mediating mechanism through which Herding Behavior contributes to stronger Purchase Intention.

Despite increasing scholarly attention to Herding Behavior, Risk Aversion, and FOMO in consumer research, previous studies have often examined these constructs independently or within general e-commerce contexts. Existing evidence indicates a positive relationship between Herding Behavior and FOMO, suggesting that consumers' tendency to follow others may be associated with stronger feelings of missing out (Chiet al., 2025). Herding Behavior has also been found to significantly influence consumer Purchase Intention, particularly in digital environments where social interaction and peer visibility reinforce imitative behavior (Chen et al., 2024). However, limited research has integrated these constructs into a unified framework that simultaneously examines the mediating roles of FOMO and Risk Aversion in explaining Purchase Intention, particularly within the competitive smartphone market.

Therefore, this study aims to examine the influence of Herding Behavior on Customer Purchase Intention by investigating the mediating roles of FOMO and Risk Aversion in consumer decision-making. By focusing on Samsung consumers in Southeast Asian mobile markets, this study seeks to provide context-specific insights into how social influence, psychological factors, and risk perceptions interact in shaping Customer Purchase Intention.

The significance of this study lies in both its theoretical and practical contributions. Theoretically, this study contributes to the consumer behavior literature by integrating Herding Behavior, FOMO, Risk Aversion, and Customer Purchase Intention within a unified framework that incorporates parallel mediating mechanisms. Practically, the study may provide valuable insights for Samsung and other smartphone marketers and managers in developing strategies that leverage social proof, address consumers' perceived risks, and better understand psychological mechanisms such as FOMO. Overall, this study contributes to a deeper understanding of consumer decision-making within competitive Southeast Asian mobile markets.

LITERATURE REVIEW

Customer Purchase Intention

Purchase Intention refers to an individual's conscious plan or willingness to perform a particular purchasing behavior (Komalasari et al., 2021). It reflects a consumer's intention to purchase a product or service from a particular brand within a specific period (Rafsandjani, 2018). Purchase Intention can also be understood as the likelihood that a consumer will purchase a particular product or service. It develops through cognitive and learning processes that shape consumers' perceptions and evaluations of specific products or services.

Purchase Intention may be either positive or negative. Positive Purchase Intention reflects a greater likelihood of an actual purchase, whereas negative Purchase Intention indicates a lower likelihood of purchasing a product or service (Arslan & Zaman, 2014). The Theory of Planned Behavior (TPB) has been widely applied to explain consumers'

behavioral intentions and purchasing behavior (Ajzen, 1991; Komalasari et al., 2021). According to TPB, behavioral intention represents an important antecedent of actual behavior and is influenced by attitudes, subjective norms, and perceived behavioral control (Ajzen, 2020).

Several factors may contribute to the formation of Purchase Intention, including previous experiences, brand reputation, word-of-mouth, perceptions, and individual beliefs (Chen, 2024). Purchase Intention has also been assessed through several dimensions, including exploratory, transactional, referential, and preferential interests (Rafsandjani, 2018). Previous research has identified social experiences (Handarkho, 2020), brand awareness (Chen, 2024), consumer perceptions, product presentation, packaging, and celebrity endorsement (Pham et al., 2023) as factors that may influence Customer Purchase Intention.

Herding Behavior

Herding Behavior refers to individuals' tendency to follow or imitate the actions and decisions of others. It occurs when individuals follow the behavior of a group even when their personal preferences may differ from those of the majority. Under conditions of uncertainty, consumers may rely on social cues and cognitive shortcuts rather than conducting an extensive evaluation of available information.

The Elaboration Likelihood Model (ELM) provides a theoretical explanation for how consumers process information through two primary routes: the central route and the peripheral route. The central route involves careful and detailed evaluation of information before making a decision, whereas the peripheral route relies more heavily on simplified cues or cognitive shortcuts, such as following the behavior of the majority (Yu & Chen, 2018). The route selected depends on consumers' motivation and ability to process information. When consumers have limited motivation or ability to evaluate information extensively, they may be more likely to rely on the peripheral route (Park & Kim, 2008).

Information Cascade Theory also provides an important theoretical foundation for understanding Herding Behavior. According to this theory, individuals may disregard their private information or personal preferences after observing that others are making different choices (Ali et al., 2021). Previous studies have suggested that Herding Behavior may involve both rational and irrational decision-making. Consumers may imitate others without extensively evaluating available information, while in other situations they may initially evaluate a product based on its characteristics but make the final purchasing decision after observing that many other consumers have selected the same product (Ali et al., 2021).

Previous research has demonstrated that Herding Behavior can influence Customer Purchase Intention (Chen, 2024; Jiang et al., 2019). Consumers can observe and learn from the behaviors of others, and such social information may influence their evaluations and purchasing decisions. In the smartphone market, observing that other consumers prefer or purchase a particular product may increase confidence in the product and subsequently strengthen Purchase Intention. Based on this relationship, the following hypothesis is proposed:

H1: Herding Behavior has a positive influence on Customer Purchase Intention.

Fear of Missing Out

Fear of Missing Out (FOMO) refers to a psychological state in which individuals perceive that others may be experiencing rewarding events or opportunities without their participation, potentially resulting in feelings of dissatisfaction or social disconnection

(Alfina et al., 2023). Social media may contribute to FOMO because digital platforms enable individuals to continuously observe and compare their experiences, possessions, and activities with those of others (Rautela & Sharma, 2022; Zhang et al., 2022).

Herding Behavior may contribute to FOMO because observing others adopting or purchasing a particular product can increase consumers' concerns about being excluded from a trend or desirable experience. Existing research has identified an association between Herding Behavior and FOMO, indicating that social imitation and psychological concerns about missing out may be closely related (Chi et al., 2025). Accordingly, the following hypothesis is proposed:

H2: Herding Behavior has a positive influence on Fear of Missing Out (FOMO).

FOMO may subsequently influence consumers' purchasing decisions. Consumers who perceive that others are enjoying products, experiences, or opportunities that they do not possess may develop stronger motivation to make a purchase. Previous research has demonstrated that FOMO can influence consumers' willingness to purchase and may contribute to less deliberative purchasing decisions (Gupta & Shrivastava, 2021). FOMO may therefore serve as a psychological mechanism that strengthens Customer Purchase Intention. Based on this relationship, the following hypothesis is proposed:

H4: Fear of Missing Out (FOMO) has a positive influence on Customer Purchase Intention.

Risk Aversion

Risk Aversion refers to the extent to which individuals prefer to avoid uncertainty and potential negative outcomes when making decisions (Pham et al., 2023). In consumer purchasing contexts, particularly for high-involvement products such as smartphones, consumers may encounter financial, functional, and social risks. Risk-averse consumers may therefore rely more heavily on external information and social cues when evaluating alternatives (March & Shapira, 1987).

Herding Behavior may influence consumers' responses to perceived risk because observing the decisions of other consumers can provide social information that affects how uncertainty is evaluated (Zambrano-Cruz et al., 2018). Consumers who rely on the behavior of others when making decisions may therefore demonstrate different levels of Risk Aversion when considering a purchase. Based on the proposed relationship in this study, the following hypothesis is formulated:

H3: Herding Behavior has a significant influence on Risk Aversion.

Previous research has also demonstrated that Risk Aversion can influence Customer Purchase Intention (Ventre & Kolbe, 2020). Consumers with higher levels of Risk Aversion may evaluate potential negative outcomes more carefully and adjust their Purchase Intention accordingly. In smartphone purchasing decisions, where consumers may perceive financial and functional uncertainty, Risk Aversion may therefore contribute to differences in Customer Purchase Intention. Accordingly, the following hypothesis is proposed:

H5: Risk Aversion has a significant influence on Customer Purchase Intention.

Mediating Roles of FOMO and Risk Aversion

Beyond its direct relationship with Customer Purchase Intention, Herding Behavior may influence purchasing decisions indirectly through psychological mechanisms.

Consumers who observe the choices and behaviors of others may experience stronger Fear of Missing Out (FOMO) and may also rely on social information when evaluating uncertainty and perceived risk. In turn, both FOMO and Risk Aversion may contribute to Customer Purchase Intention. Therefore, this study examines FOMO and Risk Aversion as parallel mediators linking Herding Behavior with Customer Purchase Intention.

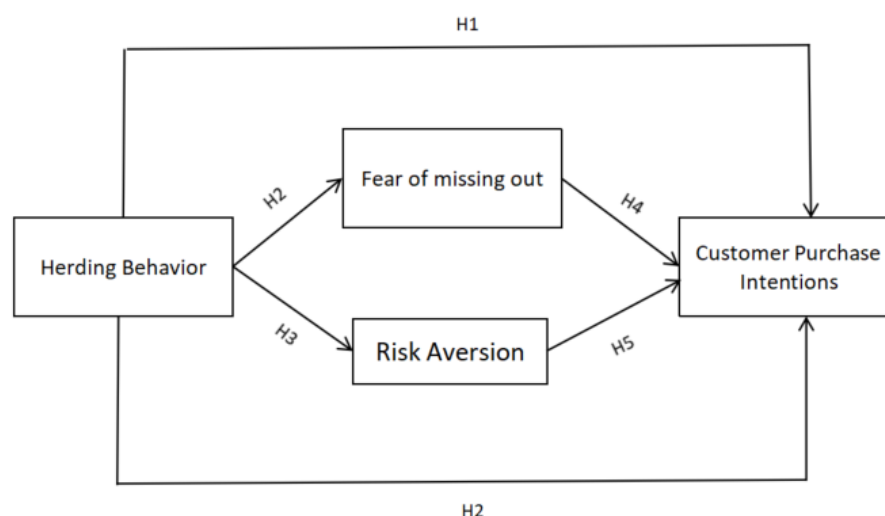
H6: Fear of Missing Out (FOMO) and Risk Aversion mediate the relationship between Herding Behavior and Customer Purchase Intention.

Conceptual Framework

The conceptual framework of this study is presented in Figure 1. Herding Behavior is positioned as the primary independent variable, while Customer Purchase Intention serves as the dependent variable. Fear of Missing Out (FOMO) and Risk Aversion are incorporated as parallel mediating variables to explain the indirect mechanisms through which Herding Behavior may influence Customer Purchase Intention.

The framework proposes that Herding Behavior influences Customer Purchase Intention directly and also indirectly through FOMO and Risk Aversion. Herding Behavior is proposed to influence FOMO and Risk Aversion, which in turn influence Customer Purchase Intention. The framework therefore integrates social influence, psychological responses, and risk-related considerations to explain Customer Purchase Intention toward Samsung smartphones in Southeast Asian mobile markets.

Figure 1. Research Framework



RESEARCH METHOD

Research Design

This study employed a quantitative research approach with a cross-sectional survey design to examine the proposed hypotheses concerning the effect of Herding Behavior on Customer Purchase Intention toward Samsung smartphones in Southeast Asian mobile markets. Data were collected at a single point in time to examine respondents' existing perceptions, attitudes, and behavioral intentions related to smartphone purchasing decisions. A quantitative approach was selected because the study aimed to evaluate the relationships among the study variables through statistical analysis. The cross-sectional design also facilitated the efficient collection of data from respondents across Southeast Asian countries, providing an overview of current consumer behavior in the regional smartphone market.

Population and Sample

The target population comprised consumers in Southeast Asia who were familiar with Samsung smartphones. Samsung was selected as the focal brand because of its strong market presence and popularity within the region, making it relevant to the examination of Herding Behavior, Fear of Missing Out (FOMO), Risk Aversion, and Customer Purchase Intention in the smartphone market.

This study employed a non-probability convenience sampling technique due to accessibility considerations and the use of an online survey for data collection. Participants were recruited through several social networking platforms, including WhatsApp, Telegram, Facebook, and LinkedIn. To ensure the relevance of the responses, only individuals who were familiar with smartphones and had knowledge of Samsung products were invited to participate. A total of 159 completed and valid questionnaires were obtained for data analysis. Although the sampling procedure was non-random, the sample size was considered adequate for the regression-based statistical analyses conducted in this study.

Data Collection Procedure

Primary data were collected through a structured, self-administered questionnaire developed using Google Forms. The online survey method was selected because it was economical, convenient for participants, and enabled the researchers to reach respondents across different Southeast Asian countries. Prior to participation, respondents were informed about the purpose of the study and assured that their participation was voluntary. The confidentiality of participants was protected, and the collected information was used solely for academic purposes.

The questionnaire was developed by adapting measurement items from established studies, with necessary modifications to suit the context of Samsung smartphone consumers in Southeast Asia. To support content validity, the survey instrument was examined and refined based on relevant literature in consumer behavior and marketing research.

The questionnaire was divided into four sections. The first section collected respondents' demographic information, including age, gender, nationality, ethnicity, educational level, field of study, and monthly income. This information was collected to describe the respondents' profiles and provide insights into the socio-demographic characteristics of the study sample.

The second section measured Herding Behavior, referring to consumers' tendency to rely on the opinions, reviews, and purchasing actions of others when considering Samsung smartphones. The third section measured Fear of Missing Out (FOMO) and Risk Aversion. FOMO refers to consumers' concerns about missing current trends, exclusive offers, or popular products, whereas Risk Aversion reflects consumers' tendency to avoid uncertainty and perceived risks when making purchasing decisions. The final section measured Customer Purchase Intention, representing consumers' willingness and likelihood to purchase Samsung smartphones in the future.

Except for the demographic questions, all constructs were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The measurement items were adapted from established consumer behavior and marketing studies to support the reliability and validity of the research instrument.

Data Analysis

The collected data were analyzed using IBM SPSS. Reliability analysis was conducted using Cronbach's alpha to assess the internal consistency of the measurement items. Descriptive statistics were employed to summarize the demographic characteristics of the respondents and provide an overview of the study sample. Pearson correlation analysis was subsequently conducted to examine the strength and direction of the relationships among the study variables.

Multiple regression analysis was employed to test the proposed hypotheses. Specifically, the analyses examined the direct effect of Herding Behavior on Customer Purchase Intention, the effect of Herding Behavior on FOMO and Risk Aversion, and the effects of FOMO and Risk Aversion on Customer Purchase Intention. The analysis also examined the parallel mediating roles of FOMO and Risk Aversion in the relationship between Herding Behavior and Customer Purchase Intention. Structural Equation Modeling (SEM) was not employed because the study focused on hypothesis testing through regression-based analysis.

RESULTS

Respondent Demographics

A total of 159 responses were collected, all of which were considered valid for data analysis. Table 1 presents the demographic characteristics of the respondents.

In terms of gender, the majority of respondents were female, accounting for 68.6% (109 respondents), while male respondents represented 31.4% (50 respondents) of the sample. Regarding age, respondents aged 21–23 years constituted the largest group, accounting for 61.0% (97 respondents). This was followed by respondents aged 24–26 years at 17.6% (28 respondents), 18–20 years at 8.2% (13 respondents), above 26 years at 7.5% (12 respondents), and below 18 years at 5.7% (9 respondents).

Regarding nationality, Malaysian respondents represented 74.2% (118 respondents) of the sample, while non-Malaysian respondents accounted for 25.8% (41 respondents). In terms of ethnicity, Chinese respondents constituted the largest group at 46.5% (74 respondents), followed by Pakistani respondents at 26.4% (42 respondents), Malay/Bumiputera respondents at 22.6% (36 respondents), and Indian respondents at 4.4% (7 respondents).

Regarding educational level, most respondents held or were pursuing a bachelor's degree, representing 70.4% (112 respondents) of the sample. This was followed by respondents with a master's degree at 17.6% (28 respondents), pre-university education at 6.3% (10 respondents), secondary school education at 3.8% (6 respondents), and a PhD at 1.9% (3 respondents).

Table 1. Demographic Characteristics of Respondents (N = 159)

Demographic	Category	Frequency	Percentage (%)
Age	Below 18	9	5.7
	18–20	13	8.2
	21–23	97	61.0
	24–26	28	17.6
	Above 26	12	7.5
Gender	Male	50	31.4
	Female	109	68.6
Nationality	Malaysian	118	74.2
	Non-Malaysian	41	25.8

Ethnicity	Chinese	74	46.5
	Indian	7	4.4
	Malay/Bumiputera	36	22.6
	Pakistani	42	26.4
Education Level	Bachelor's Degree	112	70.4
	Master's Degree	28	17.6
	PhD	3	1.9
	Pre-University	10	6.3
	Secondary School	6	3.8
Field of Study	Accountancy	1	0.6
	Agriculture	1	0.6
	Arabic	1	0.6
	Arts & Humanities	19	11.9
	Botany	1	0.6
	Business & Management	82	51.6
	Dentistry	1	0.6
	Islamic Studies	2	1.3
	Law	1	0.6
	Mathematics	3	1.9
	Medical	2	1.3
	Medicine	2	1.3
	Paramedical Staff	1	0.6
	Science & Technology	22	13.8
	Social Sciences	20	12.6
Monthly Income	Less than RM2,000	148	93.1
	RM2,001–RM4,000	6	3.8
	RM4,001–RM6,000	4	2.5
	RM6,001–RM8,000	1	0.6

Regarding the field of study, Business & Management represented the largest group, accounting for 51.6% (82 respondents). This was followed by Science & Technology at 13.8% (22 respondents), Social Sciences at 12.6% (20 respondents), and Arts & Humanities at 11.9% (19 respondents). The remaining respondents were distributed across several other fields, including Mathematics, Islamic Studies, Medical, Medicine, Accountancy, Agriculture, Arabic, Botany, Dentistry, Law, and Paramedical Staff.

Regarding monthly income, the majority of respondents reported an income of less than RM2,000, accounting for 93.1% (148 respondents). Respondents earning RM2,001–RM4,000 represented 3.8% (6 respondents), followed by those earning RM4,001–RM6,000 at 2.5% (4 respondents) and RM6,001–RM8,000 at 0.6% (1 respondent). Overall, the demographic profile indicates that the sample was predominantly composed of younger respondents, particularly those aged 21–23 years, with a substantial proportion pursuing or holding bachelor's degrees and reporting monthly incomes below RM2,000.

Table 2. Descriptive Statistics, Cronbach's Alpha Coefficients, and Zero-Order Correlations for the Study Variables

Variable	1	2	3	4
1. Herding Behavior	0.859			
2. FOMO	0.762**	0.943		
3. Risk Aversion	0.231**	0.087	0.733	
4. Customer Purchase Intention	0.730**	0.684**	0.352**	0.775
Number of Items	4	6	4	3

Mean	2.783	2.519	3.832	3.015
Standard Deviation	1.241	1.293	0.900	1.194

Note. N = 159. *p < .05, **p < .01, ***p < .001. Diagonal values in bold represent Cronbach's alpha coefficients.

Table 2 presents the descriptive statistics, Cronbach's alpha coefficients, and zero-order correlations among the study variables. The Cronbach's alpha coefficients ranged from 0.733 to 0.943, indicating acceptable to excellent internal consistency across the four constructs. FOMO demonstrated the highest reliability ($\alpha = 0.943$), followed by Herding Behavior ($\alpha = 0.859$), Customer Purchase Intention ($\alpha = 0.775$), and Risk Aversion ($\alpha = 0.733$).

Regarding the descriptive statistics, Risk Aversion recorded the highest mean score (M = 3.832, SD = 0.900), followed by Customer Purchase Intention (M = 3.015, SD = 1.194), Herding Behavior (M = 2.783, SD = 1.241), and FOMO (M = 2.519, SD = 1.293).

The correlation analysis revealed positive relationships among the study variables. Herding Behavior was strongly and positively correlated with FOMO ($r = 0.762$, $p < .01$) and Customer Purchase Intention ($r = 0.730$, $p < .01$). Herding Behavior was also positively correlated with Risk Aversion ($r = 0.231$, $p < .01$). Furthermore, FOMO was positively correlated with Customer Purchase Intention ($r = 0.684$, $p < .01$), while Risk Aversion was positively correlated with Customer Purchase Intention ($r = 0.352$, $p < .01$). These findings provide preliminary evidence of significant associations among the variables examined in the study.

Regression Analysis and Hypothesis Testing

Table 3. Regression Analysis

Predictor	FOMO	Customer Purchase Intention
Herding Behavior	0.762***	0.411***
FOMO	—	0.223***
Risk Aversion	—	0.351***
R ²	0.580	0.617
F-value	215.748	82.078
Durbin-Watson Statistic	1.579	2.158

Note. N = 159. *p < .05, **p < .01, ***p < .001.

Table 3 presents the regression analysis used to examine the proposed relationships among Herding Behavior, FOMO, Risk Aversion, and Customer Purchase Intention. The results indicate that Herding Behavior had a significant positive effect on Customer Purchase Intention ($\beta = 0.411$, $p < .001$), supporting H1. This finding indicates that higher levels of Herding Behavior are associated with stronger Customer Purchase Intention toward Samsung smartphones.

Herding Behavior also had a significant positive effect on FOMO ($\beta = 0.762$, $p < .001$), supporting H2. This result suggests that consumers who are more likely to follow the behaviors and purchasing decisions of others are also more likely to experience FOMO.

Regarding Risk Aversion, Herding Behavior was positively associated with Risk Aversion ($r = 0.231$, $p < .01$). Therefore, the evidence presented in the correlation analysis supports the proposed relationship in H3. However, this relationship is based on correlation analysis rather than the regression coefficients reported in Table 3.

FOMO had a significant positive effect on Customer Purchase Intention ($\beta = 0.223$, $p < .001$), supporting H4. This finding indicates that consumers experiencing higher levels of

FOMO are more likely to demonstrate stronger intentions to purchase Samsung smartphones. Risk Aversion also had a significant positive effect on Customer Purchase Intention ($\beta = 0.351$, $p < .001$), supporting H5. Therefore, consumers' risk-related considerations appear to contribute significantly to their purchasing intentions.

The regression model predicting FOMO produced an R^2 value of 0.580, indicating that Herding Behavior explained 58.0% of the variance in FOMO. The model predicting Customer Purchase Intention produced an R^2 value of 0.617, indicating that the predictors included in the model collectively explained 61.7% of the variance in Customer Purchase Intention. Overall, the regression results demonstrate significant relationships among Herding Behavior, FOMO, Risk Aversion, and Customer Purchase Intention.

Mediation Analysis

Table 4. Direct and Indirect Effects of Herding Behavior on Customer Purchase Intention

Effect	Direct Effect	Indirect Effect	Conclusion
Herding Behavior → FOMO → Customer Purchase Intention	—	0.247***	Mediation
Herding Behavior → Risk Aversion → Customer Purchase Intention	—	0.068***	Mediation
Herding Behavior → Customer Purchase Intention	0.394***	—	Direct Effect

Note. ** $p < .001$.

Table 4 presents the direct and indirect effects of Herding Behavior on Customer Purchase Intention through FOMO and Risk Aversion. The mediation analysis indicates that Herding Behavior had a significant indirect effect on Customer Purchase Intention through FOMO ($\beta = 0.247$, $p < .001$). Herding Behavior also demonstrated a significant indirect effect on Customer Purchase Intention through Risk Aversion ($\beta = 0.068$, $p < .001$). These findings indicate that FOMO and Risk Aversion function as parallel mediating mechanisms in the relationship between Herding Behavior and Customer Purchase Intention.

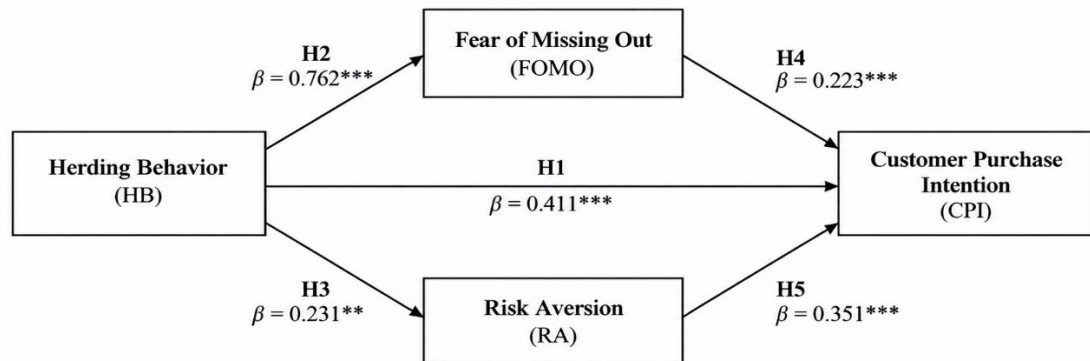
Furthermore, the direct effect of Herding Behavior on Customer Purchase Intention remained positive and statistically significant ($\beta = 0.394$, $p < .001$). The persistence of a significant direct effect alongside the significant indirect effects indicates that Herding Behavior influences Customer Purchase Intention both directly and indirectly through FOMO and Risk Aversion. Therefore, H6, which proposes the mediating roles of FOMO and Risk Aversion in the relationship between Herding Behavior and Customer Purchase Intention, is supported.

The mediation findings demonstrate that social influence may shape consumers' purchasing intentions through multiple psychological mechanisms. Herding Behavior may increase consumers' FOMO, which subsequently strengthens their intention to purchase Samsung smartphones. Similarly, Herding Behavior may operate through Risk Aversion, suggesting that consumers' responses to uncertainty and perceived risk represent another mechanism through which social influence contributes to Purchase Intention.

Overall, the findings support the proposed framework by demonstrating both direct and indirect relationships between Herding Behavior and Customer Purchase Intention. FOMO and Risk Aversion provide additional explanatory mechanisms for understanding how Herding Behavior contributes to purchasing intentions toward Samsung smartphones in Southeast Asian mobile markets.

Figure 2 presents a summary of the hypothesis-testing results based on the proposed conceptual model.

Figure 2. Hypothesis Testing Results of the Proposed Model



Hypothesis	Proposed Relationship	Result
H1	Herding Behavior → Customer Purchase Intention	Supported
H2	Herding Behavior → FOMO	Supported
H3	Herding Behavior → Risk Aversion	Supported
H4	FOMO → Customer Purchase Intention	Supported
H5	Risk Aversion → Customer Purchase Intention	Supported
H6	FOMO and Risk Aversion mediate the relationship between Herding Behavior and Customer Purchase Intention	Supported

DISCUSSION

Herding Behavior and Customer Purchase Intention

The findings support H1, indicating that Herding Behavior has a significant positive influence on Customer Purchase Intention toward Samsung smartphones. The initial regression analysis showed that Herding Behavior had a strong positive effect on Customer Purchase Intention ($\beta = 0.730$, $p < .001$), with an R^2 value of 0.533. This indicates that Herding Behavior explained 53.3% of the variance in Customer Purchase Intention when examined as the primary predictor.

These findings are consistent with the concept of herding, which suggests that individuals may rely on the behaviors and decisions of others when making decisions under conditions of uncertainty. In the context of smartphone purchases, consumers may consider peer recommendations, online reviews, product popularity, and prevailing market trends when evaluating Samsung smartphones. Such social information may reduce uncertainty and provide consumers with greater confidence in their purchasing decisions.

This relationship is particularly relevant to smartphones because they represent relatively high-involvement products involving financial commitment and the evaluation of multiple technological features (Agviriwati et al., 2026). Consumers may therefore observe the choices and experiences of others before forming their own Purchase Intention. Overall, the findings demonstrate that Herding Behavior represents an important social factor associated with Customer Purchase Intention toward Samsung smartphones.

Herding Behavior and Fear of Missing Out

The findings support H2, demonstrating that Herding Behavior has a significant positive influence on FOMO ($\beta = 0.762$, $p < .001$). The model produced an R^2 value of 0.580, indicating that Herding Behavior explained 58.0% of the variance in FOMO.

This finding suggests that consumers who are more strongly influenced by the behaviors and purchasing decisions of others are also more likely to experience concerns about missing current trends, product developments, or consumption experiences. In digital environments, consumers are continuously exposed to peer activities, online reviews, product recommendations, and trending content. Such exposure may intensify consumers' awareness of what others are purchasing and consequently increase their FOMO.

In the smartphone market, observing peers adopting particular devices or discussing new technological features may create psychological pressure to remain socially and technologically connected. Therefore, Herding Behavior may contribute not only to consumers' purchasing decisions but also to the psychological experience of FOMO (Hess & Blairy, 2001). The findings reinforce the importance of social influence in shaping consumers' emotional responses in technology-related purchasing contexts.

Herding Behavior and Risk Aversion

The findings support H3, indicating a significant positive relationship between Herding Behavior and Risk Aversion ($\beta = 0.231$, $p = .003$), with an R^2 value of 0.053. Although the explanatory power of the relationship is relatively limited, the result suggests that Herding Behavior is significantly associated with consumers' risk-related considerations.

Consumers who rely on the purchasing decisions and opinions of others may use social information as a reference when evaluating uncertainty associated with smartphone purchases. Because smartphones involve financial commitment and technological considerations, consumers may seek information from peers and other users to reduce uncertainty before making a decision. The relatively low R^2 value indicates that Risk Aversion may also be influenced by factors beyond Herding Behavior, such as consumers' financial circumstances, previous experiences, product familiarity, and individual risk preferences.

Thus, the findings suggest that social information may contribute to consumers' perceptions and management of purchasing risk, although Herding Behavior alone does not provide a comprehensive explanation of Risk Aversion.

Fear of Missing Out and Customer Purchase Intention

The findings support H4, demonstrating that FOMO has a significant positive influence on Customer Purchase Intention. Consumers experiencing higher levels of FOMO are therefore more likely to demonstrate stronger intentions to purchase Samsung smartphones.

FOMO may increase Purchase Intention because consumers who perceive that others are adopting new products, accessing new technological features, or participating in current trends may experience psychological pressure to remain connected. In the smartphone market, new product launches, promotional activities, technological innovations, and social media exposure may reinforce consumers' concerns about being excluded from desirable consumption experiences.

Therefore, FOMO represents an important psychological mechanism through which social experiences may translate into purchasing decisions. Consumers may develop stronger Purchase Intention not only because of the functional characteristics of a

smartphone but also because purchasing the product may reduce concerns about being excluded from relevant social or technological trends.

Risk Aversion and Customer Purchase Intention

The findings support H5, indicating that Risk Aversion has a significant positive influence on Customer Purchase Intention. This relationship suggests that consumers' consideration of uncertainty and potential negative outcomes contributes to their purchasing decisions.

For relatively high-involvement products such as smartphones, consumers may evaluate financial costs, product reliability, functionality, durability, and other potential risks before making a purchase. Risk-averse consumers may consequently prefer products or brands that they perceive as more established or reliable. Within the context of this study, familiarity with Samsung smartphones may provide consumers with information that assists them in evaluating potential purchasing risks.

This relationship is particularly relevant given the demographic profile of the sample, in which a substantial proportion of respondents reported relatively limited monthly incomes. For these consumers, purchasing a smartphone may represent a considerable financial commitment, increasing the importance of carefully evaluating potential risks and expected product value. Thus, Risk Aversion represents an important psychological factor associated with Customer Purchase Intention.

Mediating Roles of FOMO and Risk Aversion

The findings support H6, demonstrating that FOMO and Risk Aversion mediate the relationship between Herding Behavior and Customer Purchase Intention. The mediation analysis revealed a significant indirect effect through FOMO ($\beta = 0.247$, $p < .001$) and a significant indirect effect through Risk Aversion ($\beta = 0.068$, $p < .001$). Furthermore, the direct effect of Herding Behavior on Customer Purchase Intention remained positive and statistically significant ($\beta = 0.394$, $p < .001$).

The significant direct and indirect effects indicate that the relationship between Herding Behavior and Customer Purchase Intention operates through multiple mechanisms. Herding Behavior can directly contribute to consumers' Purchase Intention while also influencing Purchase Intention indirectly through psychological responses related to FOMO and Risk Aversion.

FOMO represents one mechanism through which consumers' exposure to the behaviors and choices of others may translate into stronger Purchase Intention. Observing other consumers adopting or discussing Samsung smartphones may increase concerns about missing relevant technological or social experiences, which subsequently contributes to Purchase Intention. Risk Aversion provides another mediating mechanism, as consumers may use the choices and experiences of others to evaluate uncertainty and potential risks associated with smartphone purchases.

Overall, the mediation results demonstrate that FOMO and Risk Aversion function as parallel mediators in explaining the relationship between Herding Behavior and Customer Purchase Intention. Nevertheless, the significant direct effect indicates that Herding Behavior continues to influence Customer Purchase Intention beyond these indirect psychological mechanisms.

CONCLUSION

This study examined the influence of Herding Behavior on Customer Purchase Intention toward Samsung smartphones in Southeast Asian mobile markets, with particular attention to the mediating roles of Fear of Missing Out (FOMO) and Risk Aversion. The findings demonstrate that Herding Behavior has a significant positive influence on Customer Purchase Intention, indicating that consumers' purchasing intentions are influenced by the behaviors, opinions, and purchasing decisions of others. Herding Behavior also significantly influences FOMO and Risk Aversion, while both FOMO and Risk Aversion significantly contribute to Customer Purchase Intention.

The mediation analysis further demonstrates that FOMO and Risk Aversion function as parallel mediators in the relationship between Herding Behavior and Customer Purchase Intention. The significant indirect effects through both FOMO and Risk Aversion indicate that social influence affects consumers' Purchase Intention not only directly but also through psychological and risk-related mechanisms. Nevertheless, the direct effect of Herding Behavior remained significant after accounting for these mediating mechanisms, indicating that social influence continues to independently contribute to Customer Purchase Intention.

Theoretically, this study contributes to the consumer behavior literature by integrating Herding Behavior, FOMO, Risk Aversion, and Customer Purchase Intention within a unified framework. The findings provide further insight into how social influence can translate into purchasing intentions through psychological responses associated with missing out and consumers' evaluations of risk. The study also extends the application of Herding Behavior beyond traditional financial contexts by examining its relevance to consumer decision-making in the smartphone market.

From a practical perspective, the findings suggest that Samsung and other smartphone marketers should consider social, psychological, and risk-related factors when developing marketing strategies. Customer reviews, peer recommendations, social proof, and information regarding product popularity may contribute to consumers' purchasing intentions. At the same time, clear information regarding product reliability, functionality, warranties, after-sales services, and long-term value may help consumers evaluate purchasing risks. Marketing strategies should therefore balance social influence with credible product information to strengthen consumers' confidence in their purchasing decisions.

Overall, this study demonstrates that Customer Purchase Intention toward Samsung smartphones is shaped by the interaction between social influence and consumers' psychological responses. Herding Behavior represents an important determinant of Purchase Intention, while FOMO and Risk Aversion provide additional mechanisms through which this influence occurs. These findings provide a broader understanding of consumer decision-making within competitive Southeast Asian mobile markets.

LIMITATION

This study has several limitations that should be considered when interpreting its findings. First, the study involved 159 respondents and was predominantly represented by younger consumers, particularly those aged 21–23 years. In addition, 93.1% of the respondents reported a monthly income below RM2,000. Consequently, the findings may primarily reflect the purchasing considerations of younger consumers with relatively limited financial resources and may not fully represent older consumers, working professionals, or individuals with higher disposable incomes. Future research should therefore involve larger and more demographically diverse samples to improve the generalizability of the findings.

Second, the study focused specifically on Samsung smartphones. Although this focus provides a specific context for examining consumer behavior, the findings may be influenced by consumers' existing familiarity with and perceptions of the Samsung brand. Therefore, the results may not necessarily apply to consumers of other smartphone brands. Future studies could conduct comparative analyses involving different smartphone brands or product categories to determine whether the relationships among Herding Behavior, FOMO, Risk Aversion, and Customer Purchase Intention vary across different brand and market contexts.

Third, the study employed a non-probability convenience sampling technique and collected data through an online cross-sectional survey. Consequently, the sample may not fully represent the broader population of smartphone consumers across Southeast Asia. Furthermore, the cross-sectional design captures consumer perceptions and intentions at a single point in time and therefore does not examine how these relationships may change over time. Future research could employ probability sampling techniques or longitudinal research designs to provide stronger evidence regarding changes in consumer behavior.

Fourth, the study relied on self-reported questionnaire responses to measure Herding Behavior, FOMO, Risk Aversion, and Customer Purchase Intention. Self-reported measures may be affected by respondents' perceptions and response tendencies, while Purchase Intention does not necessarily represent actual purchasing behavior. Future studies could incorporate actual purchasing behavior, longitudinal observations, experimental designs, or qualitative methods such as interviews to provide a more comprehensive understanding of the psychological mechanisms underlying smartphone purchasing decisions.

Finally, although the study examined respondents from Southeast Asian mobile markets, the demographic composition was not evenly distributed across countries and cultural groups. Therefore, conclusions regarding cultural or national differences should be interpreted cautiously. Future research could employ larger and more balanced samples across Southeast Asian countries and conduct formal cross-country or multi-group analyses to determine whether the proposed relationships differ according to cultural, economic, or market characteristics.

ACKNOWLEDGMENT

The authors express their sincere gratitude to the Association of International Business and Professional Management (AIBPM) for its invaluable support, guidance, and collaboration throughout the Nusantara Project 2026. The authors also extend their sincere appreciation to all individuals who contributed to and cooperated in this study.

DECLARATION OF CONFLICTING INTERESTS

The authors have declared no potential conflicts of interest concerning the study, authorship, and/or publication of this article.

REFERENCES

- Agviriwati, G. A., Hendayanti, N. P. N., Arlansa, I. G. M., Pratiwi, N. K. A. P., & Pratiwi, P. N. R. (2026). Digital content management and purchase decisions: The mediating role of customer engagement in perfume MSMEs. *International Journal of Applied Business & International Management*, 11(2), 876–894.
<https://doi.org/10.32535/ijabim.v11i2.4574>

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, 2(4), 314–324. <https://doi.org/10.1002/hbe2.195>
- Alfina, Hartini, S., & Mardhiyah, D. (2023). FOMO related consumer behaviour in marketing context: A systematic literature review. *Cogent Business & Management*, 10(3). <https://doi.org/10.1080/23311975.2023.2250033>
- Ali, M., Amir, H., & Shamsi, A. (2024). Understanding consumer herding behavior in online purchases and its implications for online retailers and marketers. *Electronic Commerce Research and Applications*, 64, 101356. <https://doi.org/10.1016/j.elerap.2024.101356>
- Ali, M., Ahmad, D., & Shah, D. (2021). Consumer herding behavior in online buying: A literature review. *MPRA Paper*.
- Arslan, M., & Zaman, R. (2014). Impact of brand image and service quality on consumer purchase intention: A study of retail store in Pakistan. *Research on Humanities and Social Sciences*, 4(22), 98–105.
- Chen, S. (2024). The impact of brand awareness on purchase intention. *Highlights in Business, Economics and Management*, 30, 239–246. <https://doi.org/10.54097/88gfk880>
- Chen, X., Wang, Y., Wei, S., & Shen, J. (2024). The effect of herd behavior on consumer intention in live streaming e-commerce: The moderating role of interaction. *International Journal of Human–Computer Interaction*. Advance online publication.
- Chi, V. M., Anh, N. T., & My, N. H. (2025). The correlation between herd behavior and fear of missing out in the Vietnamese security market. *International Journal of Innovative Research and Scientific Studies*, 8(1), 1412–1420. <https://doi.org/10.53894/ijirss.v8i1.4639>
- Gupta, S., & Shrivastava, M. (2021). Herding and loss aversion in stock markets: Mediating role of fear of missing out (FOMO) in retail investors. *International Journal of Emerging Markets*, 17(7), 1720–1737. <https://doi.org/10.1108/IJOEM-08-2020-0933>
- Handarkho, Y. D. (2020). Impact of social experience on customer purchase decision in the social commerce context. *Journal of Systems and Information Technology*, 22(1), 47–71. <https://doi.org/10.1108/JSIT-05-2019-0088>
- Hess, U., & Blairy, S. (2001). Facial mimicry and emotional contagion to dynamic emotional facial expressions and their influence on decoding accuracy. *International Journal of Psychophysiology*, 40(2), 129–141. [https://doi.org/10.1016/S0167-8760\(00\)00161-6](https://doi.org/10.1016/S0167-8760(00)00161-6)
- Jiang, C., Rashid, R. M., & Wang, J. (2019). Investigating the role of social presence dimensions and information support on consumers' trust and shopping intentions. *Journal of Retailing and Consumer Services*, 51, 263–270. <https://doi.org/10.1016/j.jretconser.2019.06.007>
- Komalasari, F., Christianto, A., & Ganiarto, E. (2021). Factors influencing purchase intention in affecting purchase decision: A study of e-commerce customer in Greater Jakarta. *Bisnis & Birokrasi: Jurnal Ilmu Administrasi dan Organisasi*, 28(1). <https://doi.org/10.20476/jbb.v28i1.1290>
- March, J. G., & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management Science*, 33(11), 1404–1418. <https://doi.org/10.1287/mnsc.33.11.1404>
- Park, E., & Kim, E. (2008). Effects of consumer tendencies and positive emotion on impulse buying behavior for apparel. *Journal of the Korean Society of Clothing and Textiles*, 32(6), 980–990. <https://doi.org/10.5850/JKSCT.2008.32.6.980>

- Pham, M., Vo, N. K. T., Tran, S. S. T., To, H. H. T., & Lam, B. Q. (2023). How does herd behaviour impact the purchase intention? Explore the moderating effect of risk aversion in the context of Vietnamese consumers. *Acta Psychologica*, 241, 104096. <https://doi.org/10.1016/j.actpsy.2023.104096>
- Promaleasy, R., Fathoni, A. F., Novrianti, D. P., & Hadi, T. S. (2024). Scroll, feel, buy: How social presence and FOMO shape impulsive and repeat purchases. *Journal of Applied Business Administration*. Advance online publication.
- Rafsandjani, R. F. (2018). Analyzing the effect of trust and perceived value on purchase intention (Case study of Shopee). *MEC-J (Management and Economics Journal)*, 71. <https://doi.org/10.18860/mec-j.v1i2.4856>
- Rautela, S., & Sharma, S. (2022). Fear of missing out (FOMO) to the joy of missing out (JOMO): Shifting dunes of problematic usage of the internet among social media users. *Journal of Information, Communication and Ethics in Society*, 20(4), 461–479. <https://doi.org/10.1108/JICES-06-2021-0057>
- Su, B.-C., Wu, L.-W., Lin, H., & Lin, C.-A. (2023). The mediating effect of herd behavior and brand attitude towards the impact of spokesman credibility, source fit, and online word-of-mouth on purchase intention. *Sustainability*, 15(1), 888. <https://doi.org/10.3390/su15010888>
- Sun, Y., Shao, X., Li, X., Guo, Y., & Nie, K. (2019). How live streaming influences purchase intentions in social commerce: An IT affordance perspective. *Electronic Commerce Research and Applications*, 37, 100886. <https://doi.org/10.1016/j.elerap.2019.100886>
- Ventre, I., & Kolbe, D. (2020). The impact of perceived usefulness of online reviews, trust and perceived risk on online purchase intention in emerging markets: A Mexican perspective. *Journal of International Consumer Marketing*, 32(4), 287–299. <https://doi.org/10.1080/08961530.2020.1712293>
- Yu, T., & Chen, S. (2018). Big data, scarce attention and decision-making quality. *Computational Economics*, 57(3), 827–856. <https://doi.org/10.1007/s10614-018-9798-5>
- Zambrano-Cruz, R., Cuartas-Montoya, G., Meda-Lara, R., Palomera-Chávez, A., & Tamayo-Agudelo, W. (2018). Perception of risk as a mediator between personality and perception of health: Test of a model. *Psychology Research and Behavior Management*, 11, 417–423. <https://doi.org/10.2147/PRBM.S165816>
- Zhang, J., Jiang, N., Turner, J. J., & Pahlevan-Sharif, S. (2022). The impact of scarcity on consumers' impulse buying based on the S-O-R theory. *Frontiers in Psychology*, 13, 792419. <https://doi.org/10.3389/fpsyg.2022.792419>

ABOUT THE AUTHOR(S)

1st Author

Dr. Lay Hong Tan is a Senior Lecturer in the Faculty of Technology Management and Technopreneurship at Universiti Teknikal Malaysia Melaka (UTeM). She earned her Ph.D. in 2017 from the same institution, having previously completed her Master's at Universiti Tunku Abdul Rahman and her Bachelor (Hons) degree in 2008 at UTAR. Dr. Tan's research and teaching focus on service marketing, service quality, technology management, and sustainable management, with additional industrial experience in the food manufacturing sector.

2nd Author

Zechan Anwar is currently an undergraduate student at Universiti Sains Malaysia.

3rd Author

Meryl Qin Lei Yan is currently an undergraduate student at Universiti Sains Malaysia. Email: merylyan4@gmail.com.

4th Author

Mohammad Aliff Ashraff Bin Alias is currently an undergraduate student at Universiti Sains Malaysia.

5th Author

Muhammad Khairul Nizam Bin Abdul Razak is currently an undergraduate student at Universiti Sains Malaysia.

6th Author

Muhamad Nazirul Amin Bin Mohd Zaid is currently an undergraduate student at Universiti Sains Malaysia.

7th Author

Muhammad Salman Tasawar is currently an undergraduate student at University of Okara, Pakistan.

8th Author

Aliza Fatima is currently an undergraduate student at University of Okara, Pakistan.

9th Author

Hamza Akram is currently an undergraduate student at University of Okara, Pakistan.

10th Author

Dr. Daisy Mui Hung Kee is an Associate Professor at the School of Management, Universiti Sains Malaysia. She earned her PhD from the University of South Australia and an MBA from USM. A prolific scholar, she has authored over 85 Web of Science-indexed and 127 Scopus-indexed publications. In addition to her academic contributions, Dr. Kee serves as the Country Director for the Association of International Business and Professional Management (AIBPM) and the STAR Scholars Network. Email: daisy@usm.my. ORCID ID: 0000-0002-7748-8230