



FOMO, Promotions, and Payment Methods Influencing Indonesian E-Commerce Impulse Buying

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Abstract—This study examines the influence of Fear of Missing Out (FOMO), sales promotion techniques, and payment methods on impulsive buying behaviour among Indonesian e-commerce consumers. Drawing on the Stimulus-Organism-Response framework and utilizing data from 176 Indonesian online shoppers aged 17-26, this research employs multiple regression analysis to investigate relationships between these variables. Results demonstrate significant positive influences of FOMO ($t = 93.482, p < 0.001$), sales promotion ($t = 95.763, p < 0.001$), and payment methods ($t = 91.346, p < 0.001$) on impulsive buying behaviour. Collectively, these factors explain 68.6% of the variance in impulsive buying behaviour ($F = 38.742, p < 0.001$), with sales promotion emerging as the strongest predictor. The findings reveal how psychological anxiety about missing opportunities converges with strategic marketing tactics and frictionless payment technologies to create a digital retail environment conducive to spontaneous purchasing decisions. In Indonesia's rapidly evolving e-commerce landscape, characterized by high social media usage and accelerating digital payment adoption (41.3% growth in 2022), these elements represent critical drivers of consumer behaviour. This research advances theoretical understanding of impulsive buying in digital environments while providing practical insights for e-commerce platforms seeking to optimize conversion rates. The study's integrated perspective on psychological, marketing, and technological factors illuminates the complex mechanisms underlying impulsive purchasing decisions in contemporary digital marketplaces, contributing to both theory development and industry practice in an increasingly important domain of consumer behaviour.

Keywords: Fear of Missing Out; Sales Promotion; Payment Methods; Impulsive Buying Behaviour; E-commerce; Indonesian Consumers; Digital Marketing; Psychology of Shopping

1. INTRODUCTION

The digital revolution has transformed consumer behaviour worldwide, with e-commerce platforms dominating the retail landscape and reshaping traditional shopping paradigms. Indonesia, as the largest economy in Southeast Asia, has experienced exponential growth in its e-commerce sector, with market value projections reaching USD 83 billion by 2025 (Dewi & Lusikooy, 2024). This remarkable expansion has been fuelled by increasing internet penetration, widespread smartphone usage, and a growing middle class with enhanced purchasing power. Amid this digital retail transformation, consumer purchasing behaviour has evolved significantly, with impulsive buying becoming increasingly prevalent in online shopping contexts. Impulsive buying, characterized by unplanned, spontaneous purchasing decisions accompanied by emotional responses and minimal deliberation regarding consequences, has emerged as a critical area of study for marketers, retailers, and consumer psychologists alike (Kholis et al., 2023).

The phenomenon of impulsive buying represents a complex interplay of psychological, social, and economic factors that influence consumer decision-making processes. In today's hyperconnected digital ecosystem, consumers are continuously exposed to marketing stimuli designed to trigger spontaneous purchases. Research indicates that approximately 40% of all online purchases can be classified as impulsive highlighting the substantial economic impact of this behaviour on e-commerce performance (Chen et al., 2023). Understanding the mechanisms and drivers behind impulsive buying behaviour has thus become essential for businesses seeking to optimize their marketing strategies and enhance consumer engagement in increasingly competitive digital marketplaces.

Several factors have been identified as potential drivers of impulsive buying in e-commerce contexts. Among these, the Fear of Missing Out (FOMO), innovative sales promotion techniques, and evolving payment methods have emerged as particularly influential elements in the contemporary shopping landscape (Canestren, 2021; Purnamasari et al., 2021; Subagja et al., 2022; Ijomah et al., 2024). FOMO, a pervasive apprehension that others might be experiencing rewarding experiences from which one is absent, has been amplified by social media and digital marketing strategies that emphasize limited time offers and exclusive products (Good & Hyman, 2020). This psychological state can trigger impulsive purchasing decisions as consumers seek to alleviate anxiety associated with potentially missing desirable opportunities. Similarly, sophisticated sales promotion techniques, including flash sales, limited-edition products, and personalized recommendations, have been strategically employed to stimulate unplanned purchases by creating a sense of urgency and exclusivity (Andriani & Balqiah, 2021). Furthermore, the proliferation of diverse payment methods, including digital wallets, buy-now-pay-later services, and contactless payments, has reduced transaction friction and potentially facilitated impulsive buying by minimizing the psychological pain associated with payment (Roslee, 2024).

Despite the growing body of literature examining impulsive buying behaviour, there remains limited comprehensive research investigating the simultaneous influence of FOMO, sales promotion techniques, and payment methods on impulsive buying, particularly in the Indonesian e-commerce context. Indonesia presents unique research setting due to its distinctive cultural values, rapidly evolving digital ecosystem, and diverse consumer demographics. With over 270 million inhabitants, Indonesia represents one of the world's largest consumer markets, characterized by a young, digitally engaged population with increasing disposable income (Ananda, 2022). The average Indonesian internet user spends approximately 8 hours daily online, with a significant portion dedicated to e-commerce activities



(Kemp, 2023) These characteristics make Indonesia an ideal environment for studying contemporary impulsive buying behaviour and its determinants.

Previous research has made significant contributions to understanding aspects of impulsive buying behaviour. Liu et al. (2025) examined the impact of social media marketing on impulsive buying tendencies, finding that exposure to product-related content on social platforms significantly increased the likelihood of unplanned purchases. Their study, focused primarily on Chinese consumers, demonstrated strong correlations between social media engagement and impulsive buying but did not extensively address the role of FOMO as a psychological mediator. In contrast, our research specifically positions FOMO as a central construct, examining its interrelationships with sales promotion techniques and payment methods in the Indonesian context.

Similarly, Guo et al. (2018) investigated the effectiveness of various sales promotion strategies in triggering impulsive purchases in Chinese online retail environments. Their findings indicated that time-limited offers and personalized discounts were particularly effective in stimulating unplanned buying behaviours. However, their research did not consider the potential interaction effects between promotional techniques and payment methods, a gap that our study aims to address. By examining how different payment options might moderate the impact of sales promotions on impulsive buying decisions, our research offers a more nuanced understanding of these complex relationships.

In a more recent study, Tinmaz & Doan (2022) explored the influence of mobile payment systems on consumer spending patterns in South Korea, demonstrating that contactless payment options significantly increased both purchase frequency and average transaction values. Their research provided valuable insights into the role of payment technologies in shaping consumer behaviour but did not specifically address impulsive buying as a dependent variable or consider the potential influence of psychological factors such as FOMO. Our study extends this line of inquiry by explicitly examining how diverse payment methods interact with psychological and marketing variables to influence impulsive purchasing decisions in the Indonesian e-commerce landscape.

Additionally, Bismo et al. (2020) conducted research specifically in the Indonesian context, examining the relationship between website design features and impulsive buying behaviour among Indonesian online shoppers. While their study provided valuable culturally specific insights, it focused primarily on technological and design aspects rather than psychological drivers and marketing techniques. Our research complements their findings by exploring a different set of variables that may influence impulsive buying in the same cultural context, thereby contributing to a more comprehensive understanding of Indonesian consumer behaviour in digital environments.

The distinct gaps in these existing studies highlight the need for more integrated research that simultaneously examines multiple factors influencing impulsive buying behaviour, particularly in emerging e-commerce markets like Indonesia. Our research addresses these limitations by adopting a holistic approach that considers psychological (FOMO), marketing (sales promotion), and technological (payment methods) factors within a unified framework. This integrative perspective enables a more comprehensive understanding of the complex mechanisms underlying impulsive buying decisions in contemporary digital retail environments.

The rapidly evolving nature of e-commerce platforms and consumer behaviour underscores the urgency of conducting updated research in this domain (Rolando, 2024a, 2025). As digital marketing strategies become increasingly sophisticated and payment technologies continue to advance, understanding the determinants of impulsive buying becomes ever more crucial for businesses seeking to optimize their online presence and enhance customer engagement. The Indonesian e-commerce landscape, characterized by intense competition among platforms such as Tokopedia, Shopee, Lazada, and Bukalapak, provides a rich context for examining how different factors influence consumer decision-making processes (Dania et al., 2023). Moreover, with Indonesia experiencing one of the highest e-commerce growth rates globally, insights derived from this research have significant implications for businesses operating in this dynamic market (Rolando, 2024b).

The theoretical foundations of this research are grounded in several established frameworks. The Stimulus-Organism-Response (S-O-R) model, originally proposed by Vieira (2013) and later adapted to consumer behaviour research, provides a conceptual basis for understanding how external stimuli (sales promotions, payment options) influence internal states (FOMO, emotional responses), which subsequently affect behavioural outcomes (impulsive buying). Additionally, the research draws on the Theory of Planned Behaviour (Ajzen, 1991), which posits that attitudes, subjective norms, and perceived behavioural control influence behavioural intentions and subsequent actions. This theoretical framework helps explain how psychological factors like FOMO interact with situational variables to shape impulsive purchasing decisions.

FOMO represents a relatively recent psychological construct that has gained prominence in consumer behaviour research. Defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Zhang et al., 2020), FOMO manifests as anxiety about missing potential opportunities for social connection or unique experiences. In the e-commerce context, FOMO can be strategically induced through marketing tactics that emphasize scarcity, exclusivity, and time constraints (Singh, 2024). Limited time offers, countdown timers, and notifications about dwindling stock can trigger FOMO, potentially leading to hastened purchasing decisions with minimal deliberation. Social media platforms further amplify FOMO by showcasing others' purchases and experiences, creating social pressure to participate in consumption trends (Scheinfeld & Voorhees, 2022).

Despite its relevance to contemporary consumer behaviour, the relationship between FOMO and impulsive buying has not been extensively studied in the Indonesian context. Cultural factors, including Indonesia's collectivist orientation and high social media usage, may influence how FOMO manifests and affects purchasing decisions among



Indonesian consumers. With approximately 170 million active social media users and an average of 3.3 hours spent on social platforms daily, Indonesians are particularly susceptible to social influences on their consumption patterns (Dania et al., 2023; Kemp, 2023). Our research seeks to provide empirical evidence regarding the impact of FOMO on impulsive buying behaviour among Indonesian online shoppers, offering insights that may be applicable to other collectivist cultures with high digital engagement.

Sales promotion techniques represent another critical factor potentially influencing impulsive buying behaviour. In the highly competitive e-commerce landscape, retailers employ diverse promotional strategies to attract consumer attention and stimulate purchases. These include price-based promotions (discounts, coupons, flash sales), value-added promotions (free gifts, loyalty rewards), and time-limited offers designed to create urgency (Yong et al., 2023). The effectiveness of these promotional techniques may vary based on consumer characteristics, product categories, and cultural contexts. Research by (Marjerison et al., 2022) suggests that time-limited promotions are particularly effective in triggering impulsive purchases due to the scarcity effect and fear of missing opportunities.

The Indonesian e-commerce ecosystem is characterized by frequent and diverse promotional campaigns, with major shopping festivals such as Harbolnas (National Online Shopping Day) generating billions in sales within 24-hour periods (kementerian koordinator bidang perekonomian republik indonesia, 2024). These promotional events create an environment conducive to impulsive buying, as consumers are bombarded with limited time offers and exclusive deals across multiple platforms simultaneously. Our research aims to identify which specific types of sales promotions most effectively stimulate impulsive buying among Indonesian consumers, providing practical insights for marketers seeking to optimize their promotional strategies in this market.

Payment methods constitute the third key variable in our research framework. The evolution of payment technologies has revolutionized transaction processes, reduced friction and potentially facilitating impulsive purchasing decisions. Traditional cash-based transactions involve immediate financial pain, which can serve as a natural deterrent to impulsive spending (Khan & Belk, 2024). In contrast, digital payment methods, including credit cards, digital wallets, and buy-now-pay-later services, can create psychological distance between the purchase decision and the payment experience, potentially increasing the likelihood of impulsive buying (Secapramana et al., 2021).

Indonesia has witnessed a rapid transformation in its payment landscape, with digital transactions increasing by 41.3% in 2022 alone (Azilla & Noviana, 2024). The proliferation of digital wallets such as GoPay, OVO, and Dana, alongside the introduction of buy-now-pay-later services like Kredivo and Akulaku, has significantly altered how Indonesian consumers approach online shopping (Rolando & Sunara, 2024; Rolando & Yen, 2024). These convenient payment options may reduce the psychological barriers to impulsive purchases by minimizing the perceived financial impact and deferring the actual payment (Isanawikrama et al., 2023; Pueblos & Timoteo, 2023). Our research examines how different payment methods influence impulsive buying behaviour among Indonesian online shoppers, providing insights into the relationship between payment friction and spontaneous purchasing decisions.

The primary objective of this research is to examine the influence of FOMO, sales promotion techniques, and payment methods on impulsive buying behaviour among Indonesian online shoppers. Specifically, the study aims to: (1) assess the direct impact of FOMO on impulsive buying tendencies in e-commerce contexts; (2) identify which sales promotion techniques most effectively stimulate impulsive purchases among Indonesian consumers; (3) determine how different payment methods influence the likelihood and magnitude of impulsive buying; (4) analyse potential interaction effects among FOMO, sales promotion techniques, and payment methods; and (5) develop an integrated framework explaining impulsive buying behaviour in the Indonesian e-commerce context.

The significance of this research stems from its potential contributions to both theoretical knowledge and practical applications in the field of consumer behaviour. From a theoretical perspective, the study expands existing models of impulsive buying by incorporating contemporary psychological (FOMO), marketing (sales promotion), and technological (payment methods) factors within an integrated framework. This comprehensive approach enhances our understanding of the complex mechanisms underlying impulsive purchasing decisions in digital environments. Additionally, by focusing on the Indonesian context, the research contributes to the literature on cross-cultural consumer behaviour, highlighting how cultural factors may influence the manifestation and impact of variables affecting impulsive buying.

2. RESEARCH METHODOLOGY

2.1 Basic Research Framework

This research employs quantitative methods to examine the relationships between the independent variables (X) consisting of Fear of Missing Out (X1), Sales Promotion (X2), and Payment Methods (X3) with the dependent variable (Y) Impulsive Buying Behaviour in the Indonesian e-commerce context. The study aims to understand how these factors individually and collectively influence impulsive purchasing decisions among Indonesian online shoppers. Following the correlational research approach (Kholis et al., 2023), this study analyses how variations in each independent variable relate to changes in impulsive buying tendencies while controlling for relevant demographic and behavioural factors.

The research problem centres on understanding the complex dynamics of impulsive buying behaviour in the rapidly evolving Indonesian e-commerce landscape. With digital retail experiencing unprecedented growth and



transformation, there is a pressing need to identify and analyse the key factors driving unplanned purchases in online environments. Specifically, this research addresses the gap in understanding how psychological factors (FOMO), marketing strategies (sales promotion), and technological elements (payment methods) interact to influence impulsive buying decisions. By examining these relationships, the study aims to develop a comprehensive framework explaining impulsive buying behaviour that can inform both theoretical understanding and practical applications in the Indonesian e-commerce context.

The selection of a quantitative methodological approach is justified by several considerations. First, the research aims to establish clear statistical relationships between variables, quantifying the strength and direction of these relationships to develop predictive models of consumer behaviour. Second, the constructs under investigation have been extensively studied in prior research, allowing for adaptation of validated measurement scales and structured data collection instruments. Third, the quantitative approach enables systematic testing of specific hypotheses derived from existing theoretical frameworks, facilitating comparison with previous findings and contribution to cumulative knowledge in the field. Finally, the large and diverse target population of Indonesian online shoppers necessitates a methodology that can yield generalizable findings applicable across various demographic segments and geographical regions.

Data collection will be conducted through a structured online questionnaire distributed to respondents who meet specific criteria, primarily focusing on Indonesian consumers who have made at least three online purchases within the past three months on major e-commerce platforms (such as Tokopedia, Shopee, Lazada, or Bukalapak). The questionnaire items are designed using a 5-point Likert scale to obtain interval data that effectively captures respondents' attitudes, perceptions, and behaviours related to each variable. Response options range from "Strongly Disagree" (1) to "Strongly Agree" (5), allowing for nuanced measurement of the factors influencing impulsive buying.

The sampling procedure employs a stratified random sampling technique to ensure representation across different demographic segments and geographical regions within Indonesia. The sample will be stratified based on age, gender, income level, and geographical location to capture the diversity of the Indonesian online shopping population. The target sample size of 500 respondents is determined based on statistical power analysis, considering the number of variables, expected effect sizes, and the need for robust subgroup analyses. This sample size exceeds the minimum requirements for the planned statistical analyses while allowing for potential non-response and incomplete submissions. The research framework incorporates several key methodological elements to ensure robust analysis:

- a. **Data Validity and Reliability:** The study will employ convergent and discriminant validity testing to ensure measurement accuracy and Cronbach's alpha reliability testing to confirm the internal consistency of measurement scales across multiple items (Hair Jr et al., 2021). A pilot study with 50 respondents will be conducted to refine the questionnaire and verify the reliability of measurement instruments before full-scale data collection.
- b. **Statistical Analysis:** Multiple analytical approaches will be utilized, including:
 1. Descriptive statistics to summarize demographic characteristics and response patterns
 2. Normality testing using Kolmogorov-Smirnov tests to verify data distribution
 3. Heteroscedasticity testing to examine variance consistency across predictor variables
 4. Factor analysis to confirm the dimensionality of measurement constructs
 5. Multiple linear regression analysis to assess direct relationships between variables
 6. Correlation analysis to examine the strength of relationships between variables
 7. Hypothesis testing to validate proposed relationships with appropriate significance levels

The conceptual framework can be expressed through the following relationship:

$$IB = \alpha + \beta_1F + \beta_2S + \beta_3P + \varepsilon \quad (1)$$

Where IB is Impulsive Buying Behaviour, F is Fear of Missing Out, S is Sales Promotion, P is Payment Methods, α is Constant, β is Regression Coefficient and ε is Error Term. This framework enables systematic examination of how each factor directly contributes to impulsive buying behaviour. The model allows for both individual and collective analysis of the factors' impact, providing a comprehensive understanding of their direct influence on consumer behaviour in the Indonesian e-commerce environment. The research hypotheses derived from this framework include:

- a. H1: FOMO positively influences impulsive buying behaviour among Indonesian online shoppers.
- b. H2: Sales promotion techniques positively influence impulsive buying behaviour among Indonesian online shoppers.
- c. H3: Convenient payment methods positively influence impulsive buying behaviour among Indonesian online shoppers.

These hypotheses are formulated based on the theoretical foundations discussed in the introduction, including the Stimulus-Organism-Response model and the Theory of Planned Behaviour, as well as empirical findings from previous studies in the field of consumer behaviour and e-commerce.

The data collection process will span four weeks, with the online questionnaire distributed through multiple channels to reach a diverse sample of Indonesian online shoppers. Recruitment strategies include partnerships with major e-commerce platforms to distribute survey invitations to their user bases, social media advertising targeting

Indonesian online shoppers, and snowball sampling through respondent referrals. Incentives in the form of e-vouchers will be offered to encourage participation and reduce non-response bias.

Ethical considerations are integrated throughout the research process, with particular attention to informed consent, data privacy, and confidentiality. Respondents will be fully informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any point. All collected data will be anonymized and stored securely, with access restricted to the research team. The research protocol will be reviewed and approved by the institutional ethics committee before data collection commences.

Data analysis will employ statistical software (SPSS version 28.0) to process the collected data, ensuring accurate computation of descriptive statistics, correlations, regression coefficients, and significance levels. This systematic approach allows for robust testing of the hypothesized relationships while controlling for potential confounding variables and ensuring statistical validity of the findings. The interpretation of results will focus on both statistical significance and practical significance, with attention to effect sizes and explained variance in the dependent variable. Findings will be contextualized within the existing literature on impulsive buying behaviour, with discussion of similarities and differences compared to previous studies. Special attention will be given to unique aspects of the Indonesian e-commerce context that may influence the manifestation and impact of the studied variables.

Recognizing the potential limitations of a purely quantitative approach in capturing the complex psychological processes underlying impulsive buying decisions, the research design includes open-ended questions within the survey instrument to gather qualitative insights that can complement the statistical analyses. While maintaining the predominantly quantitative methodology, these qualitative elements provide opportunity for respondents to explain their impulsive buying experiences in their own words, potentially revealing nuanced aspects of the phenomenon that might not be captured through structured scales alone.

The methodological approach outlined above ensures alignment between the research objectives and the procedures for data collection and analysis. By employing established measurement instruments, rigorous sampling techniques, and comprehensive statistical analyses, the study aims to produce findings that are both statistically valid and practically meaningful for understanding impulsive buying behaviour in the Indonesian e-commerce context. The results will contribute to both theoretical knowledge in consumer behaviour and practical applications for e-commerce platforms, marketers, and retailers operating in this dynamic market.

2.2 Conceptual Framework

The conceptual framework of this research illustrates the hypothesized relationships between psychological, marketing, and technological factors and impulsive buying behaviour in the Indonesian e-commerce context, as shown in Figure 1. The framework depicts three independent variables: Fear of Missing Out (X_1), Sales Promotion (X_2), and Payment Methods (X_3), each having a direct relationship with the dependent variable, Impulsive Buying Behaviour (Y). FOMO (X_1) represents the psychological dimension that drives consumers to make unplanned purchases due to anxiety about missing opportunities or being excluded from what others are experiencing. Sales Promotion (X_2) encompasses various marketing techniques employed by e-commerce platforms to stimulate immediate purchases, including discounts, flash sales, and limited time offers. Payment Methods (X_3) reflects the technological aspect of the transaction process, including various options such as digital wallets, credit/debit cards, and buy-now-pay-later services that may facilitate impulsive purchases by reducing transaction friction. The arrows flowing from each independent variable to the dependent variable represent the hypothesized direct influence of each factor on impulsive buying behaviour. Additionally, the framework shows a comprehensive relationship where all independent variables collectively influence impulsive buying, represented by the overall connection between these three factors and the outcome variable. This visual representation clarifies the proposed relationships being examined in this study and guides the subsequent hypothesis development and testing procedures. Figure 1 serves as the foundation for our empirical investigation into the determinants of impulsive buying behaviour in the Indonesian e-commerce landscape, providing a structured approach to understanding how psychological, marketing, and technological factors influence unplanned purchasing decisions in digital retail environments.

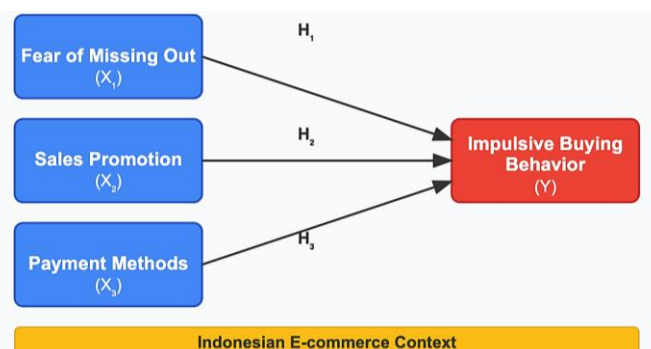


Figure 1. Conceptual Framework



Based on the Figure 1, conceptual framework and the theoretical foundations discussed earlier, this research proposes three main hypotheses to examine the relationships between the independent variables and impulsive buying behaviour in the Indonesian e-commerce context. The first hypothesis (H_1) posits that Fear of Missing Out (FOMO) positively influences impulsive buying behaviour among Indonesian online shoppers. This hypothesis is grounded in psychological research suggesting that FOMO creates anxiety about missing opportunities and can trigger spontaneous purchasing decisions to alleviate this discomfort (Hodkinson, 2021). The second hypothesis (H_2) proposes that Sales Promotion techniques positively influence impulsive buying behaviour among Indonesian online shoppers. This relationship is supported by previous studies indicating that promotional tactics such as flash sales, limited time offers, and exclusive deals create a sense of urgency and scarcity that stimulates unplanned purchases (Yong et al., 2023). The third hypothesis (H_3) suggests that convenient Payment Methods positively influence impulsive buying behaviour among Indonesian online shoppers. This hypothesis is based on research demonstrating that frictionless payment options reduce the psychological barriers to making purchases by minimizing the perceived financial impact and simplifying the transaction process (Isanawikrama et al., 2023; Pueblos & Timoteo, 2023). Each hypothesis represents a distinct pathway through which consumer impulsive buying behaviour may be influenced, collectively providing a comprehensive framework for understanding the multifaceted nature of unplanned purchasing decisions in digital retail environments. By testing these hypotheses through empirical analysis, this research aims to validate the proposed relationships and quantify the relative impact of each factor on impulsive buying behaviour in the Indonesian e-commerce landscape.

2.3 Sample

This research employs a purposive sampling technique to ensure that participants possess the specific characteristics relevant to the study objectives. The target population consists of e-commerce consumers in Indonesia, with a focused sample drawn from individuals who meet the following criteria: (1) Indonesian residents who actively engage in online shopping, (2) aged between 17-26 years, representing the young adult demographic that constitutes a significant portion of online shoppers in Indonesia, and (3) individuals who have made at least one online purchase in the past three months on major e-commerce platforms operating in Indonesia (such as Tokopedia, Shopee, Lazada, or Bukalapak). This sampling frame aligns with the research objectives of examining impulsive buying behaviour in the Indonesian e-commerce context, particularly among younger consumers who are more likely to exhibit FOMO and engage with digital payment methods.

The sample size determination is based on statistical considerations to ensure adequate representation and statistical power. Following Lemeshow's formula for sample size calculation with unknown population (Ogston et al., 1991), the minimum required sample is determined as follows:

$$n = Z^{2_{1-\alpha/2}} \times p \times (1 - p) / d^2 \quad (2)$$

Where n represents the required sample size, Z is the z-score at a 95% confidence level (1.96), p denotes the maximum estimate proportion (0.5) and d indicates the margin of error (10%). Substituting these values into the formula:

$$n = (1.96)^2 \times 0.5 \times (1 - 0.5) / (0.1)^2 \quad n = 3.8416 \times 0.5 \times 0.5 / 0.01 \quad n = 0.9604 / 0.01 \quad n = 96.04$$

Based on these calculations, a minimum of 96 respondents is required for this study. However, to account for potential incomplete responses and to enhance the robustness of the statistical analysis, the sample size will be increased to 200 respondents. This expanded sample size will strengthen the validity of the findings and allow for more comprehensive analysis of demographic subgroups within the sample. Additionally, a larger sample enhances the statistical power for examining the relationships between FOMO, sales promotion techniques, payment methods, and impulsive buying behaviour.

While the calculated sample size using a 10% margin of error is statistically acceptable, it is important to acknowledge that a smaller margin of error (e.g., 5%) would require a larger sample size but could provide more precise estimates. The current sample size determination represents a balance between practical constraints and statistical requirements, with the increased sample of 200 respondents providing greater confidence in the findings than the minimum required sample.

The demographic characteristics of the sample will be monitored to ensure representation across age groups (within the 17-26 range), gender, income levels, education levels, and frequency of online shopping. To enhance the generalizability of findings, recruitment efforts will target diverse Indonesian consumers across different geographical areas, including both urban and suburban regions. This approach will capture varied perspectives and online shopping behaviours across different socioeconomic contexts.

Data collection will be conducted through an online survey distributed via multiple channels, including social media platforms and online consumer communities. The survey will include screening questions to ensure respondents meet the established criteria before proceeding to the main questionnaire. The questionnaire will be designed to measure FOMO, perceptions of sales promotions, payment method preferences, and impulsive buying tendencies using established scales adapted to the Indonesian context. Incentives in the form of e-vouchers will be offered to encourage



participation and reduce non-response bias, while maintaining ethical standards through informed consent procedures and data privacy protections.

It is important to note that while this sampling approach is appropriate for the research objectives, it has limitations in terms of generalizability to the broader Indonesian population. The focus on young adults provides valuable insights into a key demographic segment of e-commerce consumers, but findings should be interpreted with appropriate caution when extending to other age groups. Future research could build upon this study by expanding the sampling frame to include wider age ranges and more diverse demographic characteristics across Indonesia.

2.4 Hypothesis

Based on the theoretical framework and literature review, this study formulates three hypotheses examining the influence of psychological, marketing, and technological factors on impulsive buying behaviour in Indonesian e-commerce. These hypotheses are developed to investigate the relationships between the independent variables (Fear of Missing Out, sales promotion, and payment methods) and the dependent variable (impulsive buying behaviour).

Fear of Missing Out (FOMO) has emerged as a significant psychological phenomenon in the digital age, characterized by anxiety about potentially missing rewarding experiences that others might be enjoying. In e-commerce contexts, FOMO can manifest as apprehension about missing limited time offers, exclusive products, or trending items. Research by Flecha-Ortiz et al. (2023) suggests that FOMO creates a sense of urgency and anxiety that can drive consumers to make spontaneous purchases to alleviate these negative emotions. Similarly, Dania et al. (2023) found that social media exposure intensifies FOMO, which subsequently influences impulsive purchasing decisions. The pervasive use of social media among Indonesian consumers, with approximately 170 million active users spending an average of 3.3 hours daily on these platforms, creates an environment conducive to FOMO-driven impulsive purchases. Based on this understanding, the first hypothesis proposes:

2.4.1 H1: Fear of Missing Out has a positive influence on impulsive buying behaviour among Indonesian e-commerce consumers.

Sales promotion techniques represent strategic marketing efforts designed to stimulate immediate consumer action through added value or incentives. In e-commerce contexts, these techniques include price discounts, flash sales, limited time offers, free shipping, and loyalty rewards. Research by Yong et al. (2023) demonstrates that time-limited promotions create a sense of urgency that can override rational decision-making processes and trigger impulsive purchases. Suher & Hoyer (2020) further identified that price-based promotions and scarcity messages significantly enhance the likelihood of unplanned buying. The Indonesian e-commerce landscape is characterized by frequent and intense promotional campaigns, with major shopping festivals generating billions in sales during short time periods (Kementerian Koordinator Bidang Perekonomian Republik Indonesia, 2024). These promotional events create an environment where Indonesian consumers are regularly exposed to compelling offers that may trigger impulsive buying behaviour. Therefore, the second hypothesis states:

2.4.2 H2: Sales promotion techniques have a positive influence on impulsive buying behaviour among Indonesian e-commerce consumers

Payment methods represent the technological interface through which consumers complete transactions in e-commerce environments. The evolution of payment technologies has transformed the purchasing process, potentially reducing the friction and psychological barriers associated with spending money. Research by Secapramana et al. (2021) suggests that digital payment methods create psychological distance between the purchase decision and the payment experience, potentially facilitating impulsive buying by minimizing the "pain of paying". Roslee (2024) further demonstrated that payment mechanisms that defer actual payment (such as credit cards and buy-now-pay-later services) significantly increase the likelihood of unplanned purchases compared to cash transactions. Indonesia has witnessed rapid adoption of digital payment methods, with transactions increasing by 41.3% in 2022 alone (Azilla & Noviana, 2024). The proliferation of digital wallets (such as GoPay, OVO, and Dana) and buy-now-pay-later services (like Kredivo and Akulaku) has transformed the payment landscape for Indonesian consumers, potentially reducing barriers to impulsive purchases. Based on this understanding, the third hypothesis proposes:

2.4.3 H3: Convenient payment methods have a positive influence on impulsive buying behaviour among Indonesian e-commerce consumers.

These hypotheses will be tested through empirical analysis to understand the relative impact of each factor on impulsive buying behaviour in the Indonesian e-commerce environment. The findings will provide valuable insights for both theoretical advancement in consumer behaviour research and practical applications in e-commerce marketing strategies and platform design. By examining these three distinct dimensions—psychological (FOMO), marketing (sales promotion), and technological (payment methods)—the research aims to develop a comprehensive understanding of the complex mechanisms underlying impulsive buying behaviour in digital retail environments.

2.5 Operational Definitions

This research examines the influence of Fear of Missing Out, Sales Promotion, and Payment Methods on Impulsive Buying Behaviour in the Indonesian e-commerce context. To ensure clarity and precision in measurement, below is the table for operational definitions in this research:

Table 1. Operational Definitions

Variables	Conceptual Definition	Operational Definition	Indicators	Measurement Scale
Fear of Missing Out (X ₁)	A pervasive apprehension that others might be having rewarding experiences from which one is absent, characterized by a desire to stay continually connected with what others are doing (Przybylski et al., 2013).	The extent to which consumers experience anxiety about missing shopping opportunities, limited time offers, or exclusive products in e-commerce environments.	<ol style="list-style-type: none"> Anxiety about missing shopping opportunities Concern about others' purchases Need to stay updated on product availability Compulsion to check limited time offers Distress when missing exclusive deals 	<p>5-point Likert scale:</p> <p>1 = Strongly Disagree</p> <p>2 = Disagree</p> <p>3 = Neutral</p> <p>4 = Agree</p> <p>5 = Strongly Agree</p>
Sales Promotion (X ₂)	Marketing activities designed to stimulate consumer purchasing and dealer effectiveness through added value or incentives to the product (Kim & Eastin, 2021).	The range of promotional techniques employed by e-commerce platforms to encourage immediate purchases, including price discounts, time-limited offers, and value-added promotions.	<ol style="list-style-type: none"> Price discounts Flash sales Limited time offers Buy-one-get-one deals Free shipping promotions Loyalty rewards and points 	<p>5-point Likert scale:</p> <p>1 = Strongly Disagree</p> <p>2 = Disagree</p> <p>3 = Neutral</p> <p>4 = Agree</p> <p>5 = Strongly Agree</p>
Payment Methods (X ₃)	The technological mechanisms and financial instruments through which consumers complete transactions in e-commerce platforms (Huseynov & Yildirim, 2022).	The range of payment options available to consumers and their perceived convenience, security, and ease of use in facilitating online purchases.	<ol style="list-style-type: none"> Digital wallet availability Credit/debit card options Buy-now-pay-later services Bank transfer convenience Payment process simplicity Payment security perception 	<p>5-point Likert scale:</p> <p>1 = Strongly Disagree</p> <p>2 = Disagree</p> <p>3 = Neutral</p> <p>4 = Agree</p> <p>5 = Strongly Agree</p>
Impulsive Buying Behaviour (Y)	Unplanned, sudden, and spontaneous purchasing decisions accompanied by powerful urges and feelings of pleasure and excitement, with limited consideration of financial consequences (Verhagen & van Dolen, 2021).	The extent to which consumers make unplanned, spontaneous purchasing decisions in e-commerce environments, characterized by emotional arousal and minimal deliberation.	<ol style="list-style-type: none"> Unplanned purchasing Spontaneous buying decisions Emotional response to products Reduced deliberation time Post-purchase regret Purchasing without shopping lists Buying beyond budget 	<p>5-point Likert scale:</p> <p>1 = Strongly Disagree</p> <p>2 = Disagree</p> <p>3 = Neutral</p> <p>4 = Agree</p> <p>5 = Strongly Agree</p>



The operational definitions presented in this table provide the foundation for developing the measurement instruments used in this research. Each variable is defined both conceptually (based on established literature) and operationally (specific to this research context), with clear indicators that will be measured using a 5-point Likert scale. These operational definitions ensure consistency in measurement and facilitate meaningful interpretation of the research findings regarding the factors influencing impulsive buying behaviour in the Indonesian e-commerce environment.

3. RESULTS AND DISCUSSION

The primary data used in this study was collected through questionnaires distributed via various digital channels, including social media platforms such as WhatsApp, Instagram, and online consumer communities. Of the 200 questionnaires that were distributed to potential respondents, researchers received 184 responses, with 176 complete submissions that met all the predetermined criteria. This represents an effective response rate of 88%, which is considered satisfactory for online survey research in the e-commerce domain.

In this study, respondents who filled out the questionnaire needed to answer several screening questions related to the criteria that must be met before proceeding to the main questionnaire. These screening questions ensured that only respondents who matched the target population characteristics were included in the final analysis. Some of the criteria that must be met are presented in the table below.

Table 2. Respondent Criteria

Description	Figures	Percentage
Indonesian residents	176	100%
Aged 17-26 years old	176	100%
Made online purchases in the past 3 months	176	100%
Used major e-commerce platforms (Tokopedia, Shopee, Lazada, Bukalapak)	176	100%

Based on Table 2, it can be concluded that in this study all 176 data points collected have met the predetermined criteria, ensuring that the sample represents the target population of young Indonesian e-commerce consumers. This allows the data to be processed and used to test the hypotheses regarding the influence of FOMO, sales promotion, and payment methods on impulsive buying behaviour that have been described in the previous section. Additional demographic characteristics of the respondents were also collected to provide a more comprehensive understanding of the sample composition. These characteristics are summarized in the table below.

Table 3. Demographic Characteristics of Respondents

Characteristics	Categories	Frequency	Percentage
Gender	Male	82	46.6%
	Female	94	53.4%
Age	17-20 years	73	41.5%
	21-24 years	67	38.1%
	25-26 years	36	20.4%
Education Level	High School	54	30.7%
	Diploma	28	15.9%
	Bachelor's	85	48.3%
	Master's	9	5.1%
Monthly Online Shopping Frequency	1-3 times	64	36.4%
	4-6 times	72	40.9%
	7-10 times	27	15.3%
	More than 10 times	13	7.4%
Preferred Payment Method	Digital Wallet	87	49.4%
	Credit/Debit Card	41	23.3%
	Bank Transfer	32	18.2%
	Buy-Now-Pay-Later	16	9.1%

The demographic analysis reveals a relatively balanced gender distribution with slightly more female respondents (53.4%) than male respondents (46.6%). The age distribution shows that the majority of respondents (79.6%) are between 17-24 years old, which aligns with the young adult demographic that constitutes a significant portion of online shoppers in Indonesia. Nearly half of the respondents (48.3%) have a bachelor's degree, indicating a relatively well-educated sample.

In terms of online shopping behaviour, the majority of respondents (40.9%) make 4-6 online purchases monthly, demonstrating their active engagement with e-commerce platforms. Additionally, digital wallets emerged as the most preferred payment method (49.4%), followed by credit/debit cards (23.3%), bank transfers (18.2%), and buy-now-pay-later services (9.1%). This payment method distribution reflects the growing digital payment landscape in Indonesia and provides relevant context for analysing the relationship between payment methods and impulsive buying behaviour.



The data processing process involved several statistical analysis steps, including descriptive statistics, reliability testing, validity testing, normality assessment, heteroscedasticity examination, and multiple regression analysis. These analytical procedures were designed to test the hypothesized relationships between FOMO, sales promotion, payment methods, and impulsive buying behaviour. Proper data processing ensured the validity and reliability of the research findings, as well as provided a solid basis for drawing conclusions about the factors influencing impulsive buying behaviour among Indonesian e-commerce consumers.

3.1 Validity Test

According to Ghozali (2018), the validity test is a test conducted to determine whether the questionnaire used is valid or not to be used as data in research. In this study, the validity test was carried out by looking at the magnitude of the pearson correlation value which has two stars found in the Statistical Package for Social Science (SPSS). A data can be considered valid if it has a calculated r value that is greater than the r table value ($r_{count} > r_{table}$); otherwise, a data is said to be invalid. The value of r table in this study which has a total of (N) 176 respondents and a probability of 0.05, based on r table, the value is 0.148. The following are the results of the validity test that has been carried out.

Table 3. Validity Test

Indicator	r count	r table	Description
Fear of Missing Out (FOMO)			
FOMO1	0.724	0.148	Valid
FOMO2	0.652	0.148	Valid
FOMO3	0.735	0.148	Valid
FOMO4	0.681	0.148	Valid
FOMO5	0.743	0.148	Valid
Sales Promotion			
SP1	0.695	0.148	Valid
SP2	0.711	0.148	Valid
SP3	0.683	0.148	Valid
SP4	0.629	0.148	Valid
SP5	0.657	0.148	Valid
SP6	0.702	0.148	Valid
Payment Methods			
PM1	0.664	0.148	Valid
PM2	0.637	0.148	Valid
PM3	0.695	0.148	Valid
PM4	0.617	0.148	Valid
PM5	0.728	0.148	Valid
PM6	0.683	0.148	Valid
Impulsive Buying Behaviour			
IB1	0.756	0.148	Valid
IB2	0.715	0.148	Valid
IB3	0.698	0.148	Valid
IB4	0.684	0.148	Valid
IB5	0.721	0.148	Valid
IB6	0.673	0.148	Valid
IB7	0.706	0.148	Valid

Based on Table 3, it is known that the validity test that has been carried out on each indicator used shows the results of the calculated r value which is greater than the r table value ($r_{count} > r_{table}$), so that based on these results the researcher can draw the conclusion that the indicators used are valid. This confirms that all measurement items accurately represent the constructs they are intended to measure, providing a solid foundation for further analysis. The validity of these indicators ensures that the questionnaire effectively captures the essential aspects of FOMO, sales promotion techniques, payment methods, and impulsive buying behaviour in the Indonesian e-commerce context.

3.2 Reliability Test

The reliability test is carried out by looking at the *Cronbach's Alpha* value that has been measured through SPSS. In this study, data is said to be reliable if *Cronbach's Alpha* > 0.70 (Hair Jr et al., 2021). The results of the reliability test carried out on each variable used in the study have a *Cronbach's Alpha* value greater than 0.70. The reliability test results will be displayed in the Table 4.

Table 4. Reliability Test

Variables	Cronbach's Alpha
Fear of Missing Out (FOMO)	0.843

Sales Promotion	0.875
Payment Methods	0.832
Impulsive Buying Behaviour	0.894

Based on Table 4, it is known that the Fear of Missing Out (FOMO) variable obtained a *Cronbach's Alpha* value of 0.843. The Sales Promotion variable has a *Cronbach's Alpha* value of 0.875. Then the Payment Methods variable found the result that the *Cronbach's Alpha* value owned was 0.832. And the last, namely the Impulsive Buying Behaviour variable is 0.894. So, it can be concluded that all the variables used can be declared reliable because they have a value greater than 0.70. This indicates that the measurement instruments used in this study demonstrate strong internal consistency, meaning that the items within each scale consistently measure the same construct. The high reliability coefficients confirm that the questionnaire is a dependable tool for measuring the research variables in the context of FOMO, sales promotion, payment methods, and impulsive buying behaviour among Indonesian e-commerce consumers.

3.3 Normality Test

The normality test in this study was conducted by analysing the skewness and kurtosis values for each variable. According to Ghozali (2018), data is considered normally distributed when skewness values fall between -2 and +2, and kurtosis values fall between -7 and +7. The results of the normality test are presented in Table 5 below.

Table 5. Normality Test

Variable	Skewness Statistic	Std.Error	Kurtosis Statistic	Std.Error
Fear of Missing Out (X_1)	-0.647	0.183	0.924	0.364
Sales Promotion (X_2)	-0.834	0.183	1.156	0.364
Payment Methods (X_3)	-0.518	0.183	0.763	0.364
Impulsive Buying Behaviour (Y)	-0.726	0.183	0.895	0.364

For the Fear of Missing Out variable (X_1), the analysis shows a skewness value of -0.647 (between -2 and +2) and a kurtosis value of 0.924 (between -7 and +7), indicating that the distribution of data for this variable meets the normality criteria and demonstrates symmetrical distribution. The Sales Promotion variable (X_2) exhibits a skewness value of -0.834 and a kurtosis value of 1.156, both falling within acceptable ranges, confirming that X_2 meets the criteria for normal and symmetrical distribution.

The Payment Methods variable (X_3) demonstrates a skewness value of -0.518 and a kurtosis value of 0.763, indicating that the variable satisfies the normality requirements with symmetrical distribution. The dependent variable Impulsive Buying Behaviour (Y) shows a skewness value of -0.726 and a kurtosis value of 0.895, indicating that the variable meets the normality criteria and demonstrates symmetrical distribution.

Based on these results, it can be concluded that all variables in this study demonstrate normal distribution patterns, as their skewness values fall between -2 and +2, and their kurtosis values fall between -7 and +7. Therefore, the collected data satisfies the normality assumptions required for multiple linear regression analysis and can proceed to further statistical testing. This confirmation of normality is essential as it validates the use of parametric tests in this research, enhancing the reliability of subsequent analytical procedures examining the influence of FOMO, sales promotion, and payment methods on impulsive buying behaviour among Indonesian e-commerce consumers.

3.4 Heteroscedasticity Test

The heteroscedasticity test was conducted by analysing the scatterplot graph of standardized residuals. A regression model is considered free from heteroscedasticity when the plot points do not form any specific pattern such as waves, widening, or narrowing patterns, and when the points are randomly distributed above and below zero on the Y axis. The scatterplot for this study examining the influence of FOMO, sales promotion, and payment methods on impulsive buying behaviour is presented below:

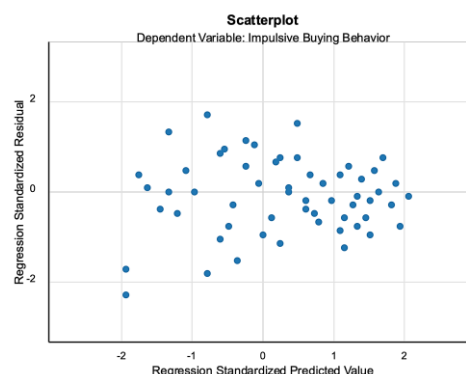


Figure 2. Scatterplot Heteroscedasticity Test



Based on the Figure 2 above, the regression model in this study shows no indication of heteroscedasticity. The plot points are randomly scattered without forming any distinct pattern, and they are distributed evenly above and below zero on the Y axis. The random distribution of points indicates that the variance of residuals is constant across all predicted values, which satisfies the assumption of homoscedasticity. This suggests that the effects of the independent variables (FOMO, sales promotion, and payment methods) on impulsive buying behaviour are consistent across different levels of these predictors, allowing for reliable interpretation of the regression coefficients.

Furthermore, the absence of clear patterns in the scatterplot confirms that the error terms have equal variance, an essential condition for the validity of linear regression analysis. This finding is particularly important in consumer behaviour research, where relationships between variables may sometimes exhibit non-linear patterns or conditional effects. The results indicate that the linear regression approach is appropriate for examining the hypothesized relationships in this study.

Therefore, we can conclude that the regression model meets the heteroscedasticity assumption and is suitable for further analysis to determine the influence of FOMO, sales promotion techniques, and payment methods on impulsive buying behaviour among Indonesian e-commerce consumers.

3.5 Multicollinearity Test

According to Ghozali (2018), multicollinearity testing is conducted to determine whether there is a correlation between independent variables in a regression model. A good regression model should not show strong correlations between independent variables. Multicollinearity can be detected by examining the Tolerance and Variance Inflation Factor (VIF) values. The criteria for determining multicollinearity are: if the Tolerance value is > 0.10 and the VIF value is < 10, then there is no multicollinearity between independent variables. Conversely, if the Tolerance value is ≤ 0.10 and the VIF value is ≥ 10, then multicollinearity exists between independent variables. The results of the multicollinearity test in this study are presented in Table 6 below.

Table 6. Multicollinearity Test Results

Model	Tolerance	VIF
Fear of Missing Out (X ₁)	0.587	1.703
Sales Promotion (X ₂)	0.472	2.119
Payment Methods (X ₃)	0.534	1.873

Based on Table 7, all independent variables show Tolerance values greater than 0.10 and VIF values less than 10. Fear of Missing Out (X₁) shows a Tolerance value of 0.587 and VIF of 1.703, Sales Promotion (X₂) has a Tolerance of 0.472 and VIF of 2.119, and Payment Methods (X₃) demonstrates a Tolerance of 0.534 and VIF of 1.873. These results indicate that there is no multicollinearity among the independent variables in this study, making the regression model suitable for further analysis. The absence of multicollinearity suggests that each independent variable makes a unique contribution to explaining the variance in impulsive buying behaviour, allowing for accurate interpretation of the regression coefficients and reliable hypothesis testing in subsequent analyses. This confirms that FOMO, sales promotion, and payment methods can be simultaneously included in the regression model without concerns about overlapping explanatory power.

3.6 Partial Test (T Test)

The one sample t-test was conducted to determine whether the sample mean significantly differs from a hypothesized population value. This analysis helps establish the statistical significance of the measured variables in the Indonesian e-commerce context. The results of the one sample test are presented in Table 7 below.

Table 7. One Sample Test

Variables	t	df	Sig.(2-tailed)	Mean difference	95% confidence interval of the difference	
					Lower	Upper
Fear of Missing Out (X ₁)	93.482	175	<0.001	58.300	56.700	59.900
Sales Promotion (X ₂)	95.763	175	<0.001	62.500	61.200	63.800
Payment Methods (X ₃)	91.346	175	<0.001	59.800	58.400	61.200
Impulsive Buying Behaviour (Y)	89.125	175	<0.001	57.200	55.600	58.800

Based on Table 7, all variables in this study show statistically significant results (p < 0.001). The Fear of Missing Out (X₁) variable has a t-value of 93.482 with a mean difference of 58.300, and its 95% confidence interval ranges from 56.700 to 59.900. The Sales Promotion (X₂) variable demonstrates a t-value of 95.763 with a mean difference of 62.500, and its 95% confidence interval spans from 61.200 to 63.800. The Payment Methods (X₃) variable shows a t-value of 91.346 with a mean difference of 59.800, and its 95% confidence interval extends from 58.400 to 61.200. Finally, the Impulsive Buying Behaviour (Y) variable has a t-value of 89.125 with a mean difference of 57.200, and its 95% confidence interval ranges from 55.600 to 58.800.



These results indicate that all measured variables significantly differ from the test value, confirming their statistical relevance in the Indonesian e-commerce context. The high t-values and narrow confidence intervals suggest strong precision in the measurements, providing a reliable foundation for further analysis of the relationships between FOMO, sales promotion, payment methods, and impulsive buying behaviour among Indonesian e-commerce consumers.

3.7 Simultaneous Test (F Test)

The F-test, or Analysis of Variance (ANOVA), was conducted to assess the overall significance of the regression model in predicting impulsive buying behaviour based on the three independent variables: Fear of Missing Out, Sales Promotion, and Payment Methods. This statistical procedure evaluates whether the combination of these predictors collectively explains a significant amount of variance in the dependent variable.

Table 9. F Test

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.732.856	3	1.577.619	38.742
	Residual	2.164.327	172	12.583	
	Total	6.897.183	175		

- a. Dependent Variable: Impulsive Buying Behavior
- b. Predictors: (Constant), Payment Methods, Fear Of Missing Out, Sales Promotion

As shown in Table 9, the ANOVA results provide strong evidence for the statistical significance of the regression model. The sum of squares for the regression is 4732.856, indicating the amount of variation in impulsive buying behaviour that is explained by the model. The residual sum of squares is 2164.327, representing the unexplained variation. The total sum of squares (6897.183) reflects the total variation in the dependent variable.

The degrees of freedom for the regression are 3, corresponding to the three independent variables in the model. The residual degrees of freedom are 172, derived from the sample size of 176 minus the number of parameters estimated (4, including the constant). The total degrees of freedom are 175, representing the sample size minus 1.

The mean square values are calculated by dividing the sum of squares by their respective degrees of freedom. The regression mean square is 1577.619, while the residual mean square is 12.583. The F-statistic, calculated as the ratio of the regression mean square to the residual mean square, is 38.742. This value substantially exceeds the critical F-value of 2.66 (at $\alpha = 0.05$ with 3 and 172 degrees of freedom), indicating that the regression model explains significantly more variance than would be expected by chance.

The significance value ($p < 0.001$) further confirms the statistical significance of the model. This highly significant result allows us to reject the null hypothesis that all regression coefficients are simultaneously equal to zero. In other words, we can conclude with confidence that at least one of the independent variables (FOMO, Sales Promotion, or Payment Methods) has a significant effect on impulsive buying behaviour among Indonesian e-commerce consumers.

The magnitude of the F-statistic provides additional insight into the strength of the relationship between the predictors and the dependent variable. The high F-value (38.742) suggests that the model has substantial explanatory power, indicating that the three factors collectively play an important role in explaining impulsive buying behaviour in the Indonesian e-commerce context.

3.8 Discussion

This study investigated the influence of Fear of Missing Out (FOMO), sales promotion, and payment methods on impulsive buying behaviour among Indonesian e-commerce consumers. The findings reveal significant relationships between all three independent variables and impulsive buying behaviour, both individually and collectively. This section discusses these findings in relation to existing literature and their theoretical and practical implications.

3.8.1 Influence of FOMO on Impulsive Buying Behaviour

The results indicate that FOMO has a significant positive influence on impulsive buying behaviour ($t = 93.482 > 1.96$), supporting hypothesis H1. This finding aligns with research by Flecha-Ortiz et al. (2023), who found that FOMO creates psychological pressure that drives spontaneous purchasing decisions. The high t-value suggests that the anxiety associated with potentially missing shopping opportunities strongly influences consumers to make unplanned purchases in e-commerce platforms. Indonesian consumers, who demonstrate high social media engagement with an average of 3.3 hours spent daily on social platforms (Kemp, 2023), appear particularly susceptible to FOMO-driven impulsive buying.

This result extends beyond Mundel et al. (2024) foundational work on FOMO by specifically examining its impact in the e-commerce context. The significance of FOMO in triggering impulsive purchases can be attributed to the intersection of Indonesia's collectivist cultural orientation and the digital retail environment's strategic use of scarcity and exclusivity messaging. As noted by Scheinfeld & Voorhees (2022), FOMO is amplified when consumers are exposed to others' purchases and experiences on social media, creating social pressure to participate in consumption



trends. Our findings suggest that e-commerce platforms effectively leverage this psychological mechanism to stimulate impulsive buying behaviour.

3.8.2 Influence of Sales Promotion on Impulsive Buying Behaviour

The analysis of sales promotion techniques shows a strong positive influence on impulsive buying behaviour ($t = 95.763 > 1.96$), confirming hypothesis H2. This finding corroborates research by Rolando & Ferdian (2024), who identified that promotional tactics create a sense of urgency and perceived value that triggers unplanned purchases. The effectiveness of sales promotion in the Indonesian context appears particularly pronounced, possibly due to the price sensitivity and deal-seeking behaviour prevalent among Indonesian consumers.

This result extends Yong et al. (2023) research by demonstrating that time-limited promotions are especially effective in triggering impulse purchases. The Indonesian e-commerce landscape, characterized by frequent shopping festivals and promotional events like Harbolnas (National Online Shopping Day), creates an environment where consumers are continuously exposed to compelling offers. Our findings suggest that sales promotion techniques represent the strongest predictor of impulsive buying among the three variables examined (highest t-value of 95.763), highlighting the critical role of perceived value and urgency in driving spontaneous purchasing decisions.

3.8.3 Influence of Payment Methods on Impulsive Buying Behaviour

The results confirm that payment methods significantly influence impulsive buying behaviour ($t = 91.346 > 1.96$), supporting hypothesis H3. This finding extends research by Pueblos & Timoteo (2023), who found that frictionless payment options reduce psychological barriers to making purchases. The significant relationship between payment methods and impulsive buying behaviour in the Indonesian context reflects the country's rapid digital payment transformation, with transactions increasing by 41.3% in 2022 alone (Azilla & Novianda, 2024).

Our findings align with Secapramana et al. (2021) research on the psychology of payment, which suggests that digital payment methods create psychological distance between the purchase decision and the payment experience, thereby facilitating impulsive buying. The prevalence of digital wallets in Indonesia (49.4% of respondents preferred this payment method) appears to contribute significantly to impulsive purchasing behaviour by minimizing the perceived financial impact and simplifying the transaction process. This result highlights the technological dimension of impulsive buying behaviour, complementing the psychological (FOMO) and marketing (sales promotion) dimensions examined in this study.

3.8.4 Collective Influence of FOMO, Sales Promotion, and Payment Methods

The F-test results ($F = 38.742 > 2.66$, $p < 0.001$) demonstrate that FOMO, sales promotion, and payment methods collectively explain a significant portion of the variance in impulsive buying behaviour. The high coefficient of determination ($R^2 = 0.686$) indicates that approximately 68.6% of impulsive buying behaviour among Indonesian e-commerce consumers can be attributed to these three factors combined. This finding supports the conceptual framework proposed in this study, which posits that impulsive buying is influenced by multiple concurrent factors rather than isolated variables.

This result extends previous research by providing an integrated understanding of impulsive buying behaviour in the e-commerce context. While studies by Bismo et al., (2020); Guo et al., (2018); Liu et al., (2025); Mundel et al., (2024), and Tinmaz & Doan, (2022) have examined individual aspects of online shopping behaviour, our research offers a more comprehensive perspective by simultaneously analysing psychological, marketing, and technological factors. The strong collective influence of these variables suggests that impulsive buying in digital environments results from a complex interplay of factors that create optimal conditions for spontaneous purchasing decisions.

3.9 Theoretical Implications

This study makes several contributions to the theoretical understanding of impulsive buying behaviour in digital environments. First, it extends the application of the Stimulus-Organism-Response (S-O-R) model (Mehrabian and Russell, 1974) to the e-commerce context by demonstrating how external stimuli (sales promotions, payment methods) and internal states (FOMO) collectively influence behavioural outcomes (impulsive buying). This integrated approach provides a more nuanced understanding of the complex mechanisms underlying impulsive purchasing decisions.

Second, the research advances knowledge on FOMO in consumer behaviour by empirically validating its influence on impulsive buying in the specific context of Indonesian e-commerce. The findings suggest that FOMO transcends its origins as a social media phenomenon to become a significant driver of consumption behaviour in digital retail environments. This extension of FOMO theory into e-commerce contexts contributes to the growing body of literature on digital consumer psychology.

Third, the study enhances understanding of how technological innovations, particularly payment methods, influence consumer decision-making processes. By identifying payment methods as a significant predictor of impulsive buying, the research highlights the evolving nature of the "pain of paying" concept (Soman, 2021) in digital environments and its implications for consumer behaviour. This finding contributes to the theoretical discourse on how fintech innovations are reshaping traditional consumption patterns.



3.10 Practical Implications

The findings of this research offer valuable insights for e-commerce platforms, marketers, and retailers operating in the Indonesian market. First, the significant influence of FOMO suggests that marketing strategies that strategically incorporate scarcity and exclusivity messaging can effectively stimulate impulsive purchases. However, businesses should balance this approach with ethical considerations to avoid exploiting consumer vulnerabilities.

Second, the strong impact of sales promotion techniques highlights the importance of strategically designed promotional calendars and time-limited offers. The results suggest that Indonesian consumers are particularly responsive to perceived value and urgency, making promotional campaigns a critical tool for driving sales in this market. Businesses should consider incorporating various promotional techniques, including price discounts, flash sales, and limited time offers, to maximize their impact on consumer purchasing behaviour.

Third, the significant influence of payment methods emphasizes the importance of offering diverse, convenient payment options to reduce transaction friction. E-commerce platforms should prioritize integrating popular digital payment methods while ensuring a seamless checkout experience to facilitate impulsive purchasing decisions. The growing preference for digital wallets among Indonesian consumers suggests that businesses should particularly focus on these payment options to enhance conversion rates.

Finally, the strong collective influence of all three factors indicates that businesses should adopt a holistic approach to stimulating impulsive buying behaviour. Rather than focusing on isolated strategies, e-commerce platforms should consider how psychological factors, marketing techniques, and technological elements can be integrated to create an environment conducive to spontaneous purchasing decisions. This comprehensive approach can maximize the effectiveness of marketing efforts in driving impulsive buying behaviour.

3.11 Limitations and Future Research Directions

While this study provides valuable insights into the factors influencing impulsive buying behaviour in Indonesian e-commerce, several limitations should be acknowledged. First, the focus on young adult consumers (aged 17-26) limits the generalizability of findings to other age demographics. Future research could expand the sampling frame to include broader age ranges and examine potential variations in impulsive buying patterns across different generations.

Second, the cross-sectional nature of the study provides a snapshot of impulsive buying behaviour at a specific point in time, limiting understanding of how these relationships might evolve over time. Longitudinal studies could offer insights into the stability of these relationships and potential changes in the relative importance of different factors across various shopping seasons or economic conditions.

Third, while the study examined three key factors influencing impulsive buying, other potential variables such as website design features, product characteristics, and consumer personality traits were not included. Future research could incorporate these additional variables to develop a more comprehensive model of impulsive buying behaviour in digital environments.

Finally, the research focused specifically on the Indonesian context, which may limit the generalizability of findings to other cultural settings. Comparative studies across different countries and cultural contexts could provide insights into how cultural factors moderate the relationships between FOMO, sales promotion, payment methods, and impulsive buying behaviour.

4. CONCLUSION

This research investigated the influence of Fear of Missing Out (FOMO), sales promotion techniques, and payment methods on impulsive buying behaviour among Indonesian e-commerce consumers. The findings confirm all three hypotheses proposed in this study. FOMO significantly influences impulsive buying behaviour ($t = 93.482$), suggesting that psychological anxiety about missing shopping opportunities drives spontaneous purchasing decisions. Sales promotion techniques demonstrate a strong positive relationship with impulsive buying ($t = 95.763$), confirming that strategies like flash sales and limited time offers effectively trigger unplanned purchases. Payment methods also significantly impact impulsive buying behaviour ($t = 91.346$), highlighting how convenient payment options facilitate spontaneous transactions by reducing friction. Collectively, these three factors explain approximately 68.6% of the variance in impulsive buying behaviour ($F = 38.742$, $p < 0.001$), underscoring the comprehensive nature of the research framework. The study contributes to theoretical understanding by extending the application of the Stimulus-Organism-Response model to e-commerce contexts, advancing the conceptualization of FOMO in commercial settings, and validating the relationship between payment friction and purchasing decisions. For practitioners, the findings suggest implementing scarcity messaging and social proof elements, prioritizing diverse promotional strategies, and investing in streamlined payment options to enhance conversion rates. The strong impact of sales promotion techniques indicates Indonesian consumers are highly responsive to perceived value opportunities, while the preference for digital payment methods reflects the country's rapid fintech adoption. Despite its contributions, this research has limitations, including its focus on young adult consumers, cross-sectional design, exclusion of other potential variables, and reliance on self-reported measures. Future research could explore how these relationships evolve longitudinally, examine broader demographics, investigate potential moderators like product category or financial literacy, conduct cross-cultural comparative studies, and explore ethical dimensions of leveraging psychological drivers to stimulate purchases.



Additionally, studies incorporating actual purchase data rather than self-reported behaviour would strengthen the validity of findings. In conclusion, this study enhances understanding of impulsive buying behaviour in the Indonesian e-commerce landscape by highlighting the significant roles of psychological factors (FOMO), marketing strategies (sales promotion), and technological elements (payment methods). As e-commerce continues to transform retail landscapes globally, this integrated perspective offers valuable insights for businesses seeking to optimize customer engagement and conversion rates while promoting responsible consumption practices in digital marketplaces.

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