The Influence of Electronic Word-of-Mouth Communication and Delay of Gratification on Online Impulsive Buying Behavior among Student Users of Shopee E-Commerce Platform in Bandung Raya

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ABSTRACT
The rapid growth of e-commerce in Indonesia has triggered a surge in online impulsive buying behavior (OIBB), particularly among university students as digital natives. This phenomenon can lead to negative consequences such as financial problems, regret, and impaired psychological well-being. This study aims to examine the effects of Electronic Word of Mouth (eWOM) and Deferment of Gratification (DoG) on OIBB among active Shopee users in the Greater Bandung area, using a quantitative regression approach with 110 respondents. The regression results show that the research model explains 59.4% of the variance in OIBB (Adjusted R^2 = 0.594). Partially, eWOM has a significant positive effect on OIBB ($\beta = 0.553$; $p < 0.001$), while DoG has a significant negative effect ($\beta = -0.327$; $p < 0.001$). These results indicate that higher exposure to eWOM increases the tendency for OIBB, whereas the ability to defer gratification can reduce such behavior. The findings provide practical benefits for individuals to enhance self-awareness, manage impulsive online shopping urges, and cultivate wiser and more controlled online shopping habits.

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1. INTRODUCTION

Technological developments have brought about major transformations in human behavior patterns, particularly in terms

of communication [1], access to information [2], and economic activities [3], [4]. Transactions based on online platforms have begun to replace conventional transactions in recent decades [5] [6]. Data from Euromonitor (2024) shows that the number of global internet users has reached 5.2 billion, with the value of online shopping transactions projected to exceed US$11 trillion [7]. Digitalization has driven the growth of the e-commerce sector in various countries [8], including developing countries such as Indonesia [9], [10]. Data from [11] shows that in 2023, the number of e-commerce business units in Indonesia reached 3.82 million, an increase of 27.40% compared to 2022, with a total transaction value of Rp1,100.87 trillion. With this growth, Shopee holds the top position as the largest e-commerce platform in Indonesia, with 132 million visits in April 2025, followed by Tokopedia (64.9 million) and Lazada (42 million) [12].

However, the ease and speed of online transactions have also led to different consumption behaviors compared to conventional purchasing models [13], [14], particularly regarding consumer psychology and purchasing decisions [15]. The rapid growth of e-commerce not only provides opportunities but also creates risks of uncontrolled consumption behavior. One significant phenomenon that has emerged is online impulsive buying behavior (OIBB) [16], [17]. Theoretically, OIBB can be explained through self-control theory [18], which highlights the conflict between the desire for instant gratification and an individual's ability to self-regulate. Specifically, OIBB refers to purchasing behavior that is carried out suddenly without prior planning or rational consideration [19], [20], [21], [22]. OIBB has become a widespread phenomenon in recent times. Liu's study in [23]shows that approximately 40% of all online shopping transactions worldwide are classified as impulsive purchases. A survey in the United States indicates that 40% of e-commerce spending comes from impulsive purchases, with women (58%) being more dominant than men (48%). Emotional pressure is the primary trigger, acknowledged by 67% of respondents. As a result, promotions targeting this behavior generate approximately $4.2 billion annually for retailers [24].

Previous studies have shown that OIBB occurs more frequently among adolescents and young adults [25], [26], [27],

including college students. A recent study by [28] of 246 young adults aged 18-25 who use pay-later features reported that 60.2% of respondents had high levels of OIBB, with 57.15% making 5-6 online transactions per month, while 26.4% fell into the moderate category. The study by [29]showed that students aged 18-24 years in Jakarta reported 3-5 impulsive purchases per month. Research by [30]on participants aged 18-30 reported that 41% of Generation Z consumers were found to have a higher tendency for impulsive shopping compared to 34% of Millennials and 32% of Generation X.

Certainly, some of these findings are based on the fact that young adults, including college students, are digital natives [31] [32], who are intensely exposed to online promotions and interactions, making them prone to making quick and uncontrolled purchasing decisions [33] [34]. OIBB has been shown to trigger various negative effects, including unplanned spending [35], regret and guilt [36], debt accumulation [37], dissatisfaction with products [38], tuition fee issues among students [39], and even overall consumer well-being [40]. On the other hand, while it can increase e-commerce profits, OIBB has been shown to trigger a massive number of customer complaints [41], making it urgent to explore the factors influencing OIBB, given the diverse, destructive impacts it may cause [42].

OIBB can be influenced by various internal and external factors [43]. One important external factor to explore in relation to OIBB is Electronic Word of Mouth Communication (eWOM) [44], as many studies have identified the various advantages of this communication variable in the field of marketing [45], [46], [47]. Electronic Word of Mouth (eWOM) is an informal online form of communication regarding personal opinions or experiences, including reviews and recommendations related to a product or service, without commercial intent [48], [49]. The SLR study by [50] using the PRISMA method on 29 publications showed that eWOM communication is a factor influencing OIBB. The study by [45] on 445 Shopee consumers showed that eWOM communication significantly influences OIBB, alongside website quality and sales promotion variables. More recently, study [51] on Shopee consumers also confirmed the significant positive influence of eWOM on OIBB. The study by [52] on respondents from 32

countries showed that eWOM significantly influences OIBB with a regression coefficient of 0.341.

Furthermore, there are several internal factors that have been proven to influence OIBB, including enthusiasm and hedonistic motivation [50], self-control [53], and mood [54]. However, one internal factor that has received less attention in OIBB studies is delayed gratification (DoG). DoG refers to an individual's tendency to postpone instant gratification in order to obtain greater benefits in the future [55], [56]. The study by [57]has shown that impulsive individuals are emotionally drawn to instant gratification in online environments. Moreover, the online shopping environment is filled with a virtual atmosphere (content, design, reviews, and attractive promotions) [58], [59], pricing strategies [33], transaction ease [60], such as through digital payments [61], and even lower prices [62]. An experimental study by [63] showed that delaying a purchase for 25 hours significantly reduced impulsive urges and purchase intentions among online consumers in the US. Although the DoG construct was not measured directly, these findings provide a theoretical assumption that the ability to delay gratification contributes to impulsive purchasing.

Although the relationship between eWOM and DoG on OIBB is theoretically well established, empirical evidence remains scarce. Study [64] recommends that future studies identify the influence of eWOM as an understudied external variable on impulse buying, particularly in the Indonesian context [65]. Conceptually, eWOM captures external social influences through consumer opinions, whereas DoG reflects internal self-control. Examining these factors together provides a more holistic understanding of OIBB. Nevertheless, no study has yet investigated their combined effects among students, who represent both the dominant e-commerce users and the primary Shopee consumers in Indonesia. Based on the above, this study poses three research questions: (1) whether eWOM communication influences OIBB among Shopee users, (2) whether DoG influences OIBB, and (3) whether eWOM and DoG simultaneously influence OIBB. The urgency of this research, besides filling the identified gap, also enriches the understanding of the key factors that trigger OIBB, given the massive scale of this phenomenon in the current era, which raises concerns. Practically,

the results of this research can serve as a reference for industry players and policymakers in designing strategies that encourage more prudent and controlled online shopping behavior.

2. METHOD

This study uses a quantitative regression approach to examine the influence [66] of eWOM communication (eWOM) (X1) and deferment of gratification (DoG) (X2) on online impulsive buying behavior (OIBB) (Y) among active Shopee users in Greater Bandung. The instrument used to measure OIBB is a modified version of the Buying Impulsiveness Scale [67], originally reported to have nine unidimensional items with reliability ($\alpha = 0.88$). The eWOM communication variable was measured using a modified 5-item scale from [68], originally reported with reliability CR = 0.90. Meanwhile, DoG was measured using a modified 12-item scale from [69], originally reported with reliability $\alpha = 0.72$. All items were measured using a 5-point Likert scale. The original English items were translated into Indonesian and then back-translated by independent bilingual experts to ensure semantic and conceptual equivalence. Cultural and online shopping contextual adjustments were incorporated, and discrepancies were reconciled. The final version was reviewed by two academic experts in economics and psychometrics to establish content validity.

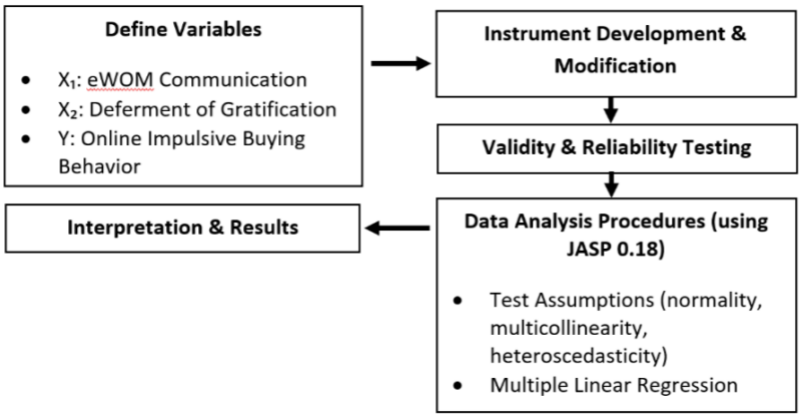

Figure 1. Research Procedure

Meanwhile, the participants in this study were active students in Greater Bandung who used the Shopee e-commerce

platform. Greater Bandung was selected as the research site because it is a metropolitan area with high internet penetration [70], making it a representative context for analyzing the emerging trends of online shopping. The study involved 110 participants, who were selected through accidental sampling using a questionnaire-based Google Form distributed online via social media. Since accurate population data were unavailable, the sample size was determined using two approaches. Following Rummel [71], a minimum of four respondents per item was required, yielding 104 respondents for 26 items. According to Green [72], the minimum sample size for regression depends on the number of predictors (m) and the type of test: $N \geq 50+8m$ for testing individual predictors (β test) and $N \geq 104+m$ for testing the overall model (R^2 test). With two predictors (eWOM and DoG), the minimum sample size is 66 for R^2 and 106 for β tests. Based on an a priori power analysis for multiple regression with two main predictors, a medium effect size (f^2 = 0.15), $\alpha = 0.05$, and power = 0.80, the minimum required sample is 68 participants [73]. Therefore, the final sample of 110 respondents meets both criteria.

Furthermore, item validity was analyzed using item–rest correlation, and construct validity was examined through Confirmatory Factor Analysis (CFA) by considering fit indices: CFI, TLI, SRMR, and AVE for convergent validity. Internal reliability was determined using Cronbach's Alpha and composite reliability (CR).

Table 1. Item-rest Correlation Range

Variable	Item-rest Correlation	Criteria	Interpretation
OIBB	0.710 – 0.550	> 0.30	Valid
eWOM	0.809 – 0.722	> 0.30	Valid
DoG	0.678 – 0.573	> 0.30	Valid

Table 2. Confirmatory Factor Analysis

Fit Indices	OIBB	eWOM	DoG	Criteria	Interpretation
Factor Loadings	0.81 – 0.49	0.885 – 0.748	0.62 – 0.72	> 0.4	Good
CFI	0.79	0.88	0.82	> 0.9 (Good)	Acceptable
TLI	0.71	0.76	0.79	0.7 – 0.9 (Acceptable)	Acceptable
GFI	0.97	0.97	0.96		Good

Fit Indices	OIBB	eWOM	DoG	Criteria	Interpretation
SRMR	0.08	0.05	0.07	< 0.08 (Good) 0.08 – 0.12 (Acceptable)	eWOM & DoG = Good; OIBB= Acceptable
AVE	0.39	0.66	0.45	> 0.5	Interpretation

Table 3. Cronbach's Alpha & Composite Reliability

Variable	Cronbach's Alpha	CR	Criteria	Interpretation
OIBB	0.848	0.848	> 0.70	High
eWOM	0.907	0.90	> 0.70	High
DoG	0.905	0.907	> 0.70	High

All items in the three variables met the item validity criteria, as each had an item–rest correlation above 0.30 [74]. Construct validity was also satisfied, indicated by factor loadings ranging from 0.49 to 0.885, exceeding the minimum threshold of 0.40 [75]. The model fit was in the acceptable category, with CFI values (0.79–0.88), TLI values (0.71–0.79), and GFI values (0.96–0.97), all within the 0.70–0.90 range still considered acceptable [76]. The SRMR values for eWOM and DoG were below 0.08 (good), while OIBB was 0.08 (acceptable), aligning with the acceptable threshold of 0.08–0.12 [76]. Although the AVE for OIBB (0.39) and DoG (0.45) fell below 0.50, both were still acceptable as their CR values were 0.848 and 0.907 respectively, in line with Fornell & Larcker's recommendation that an AVE below 0.50 is acceptable when the CR exceeds 0.60 [77], All three constructs also demonstrated excellent reliability, with Cronbach's Alpha and Composite Reliability values above 0.70 [78].

3. RESULTS

3.1 Sociodemographics and Descriptive Statistics

Table 4. Sociodemographics

Demographics	Category	Frequency	%
Gender	Male	76	69
	Female	34	31
Income	Less than Rp 500,000	6	5.4

Demographics	Category	Frequency	%
	Rp 500,000 – Rp 2,000,000	24	21.8
	More than Rp 2,000,000	80	72.7
Behavioral Characteristics	**Category**	**Frequency**	**%**
Shopping Frequency on Shopee (per month)	Less than 3 times	57	51.8
	Around 3–6 times	6	5.4
	More than 6 times	47	42.7
Duration of Using the Shopee Application	Less than 1 month	1	0.9
	Around 1–6 months	92	83.6
	More than 6 months	15	13.6

The demographic distribution indicates that most respondents were male (69%) and reported a monthly allowance of more than Rp 2,000,000 (72.7%), followed by those with Rp 500,000–Rp 2,000,000 (21.8%) and less than Rp 500,000 (5.4%). In terms of behavioral characteristics, the majority of students shopped on Shopee less than three times per month (51.8%), while 42.7% reported shopping more than six times, and only 5.4% fell within the range of three to six times. Regarding the duration of application use, most respondents had used Shopee for 1–6 months (83.6%), with smaller proportions reporting more than 6 months (13.6%) and less than 1 month (0.9%).

Table 5. Descriptive Statistics

Variable	Mean	Std. Dev	Skewness	Kurtosis
OIBB	23.70	6.49	-1.023	2.097
DoG	38.42	9.93	-1.713	4.523
eWOM	14.48	3.90	0.441	-0.626

Descriptive statistics show that OIBB (M = 23.70, SD = 6.49) and DoG (M = 38.42, SD = 9.93) both displayed negative skewness, indicating a concentration toward higher scores, with DoG also showing high kurtosis (4.523). In contrast, eWOM had the lowest mean (M = 14.48, SD = 3.90), a slight positive skew, and a relatively flat distribution (kurtosis = –0.626).

3.2. Classical Assumption Test

3.2.1 Residual Normality and Heteroskedasticity

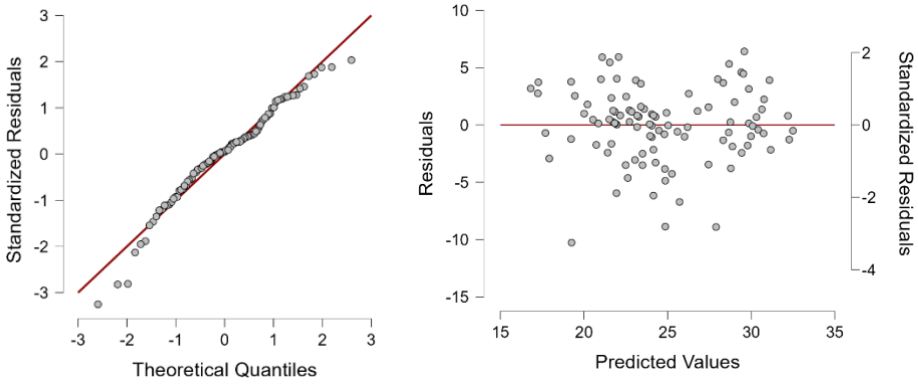

Figure 2. Q–Q Plot of Residual Normality Test (Left) and Scatterplot of Heteroskedasticity Test (Right)

The classical assumption testing was conducted through visual inspection, as several studies have shown that graphical methods such as Q-Q and residual plots can be equally effective, or in certain contexts more informative, than numerical tests [79], [80], [81]. Accordingly, a Q–Q plot was used to assess whether the residual distribution conformed to a normal distribution, where residual points aligning closely with the diagonal line indicate an approximately normal distribution [82]. To further examine the consistency of residual variance, a heteroscedasticity test was performed using a scatterplot of residuals against predicted values, with a random and patternless distribution of residuals around the horizontal zero line indicating constant variance across the range of predictions [83].

3.2.2 Multicollinearity Test

Table 6. Multicollinearity Test

Tolerance	VIF
0.632	1.581
0.632	1.581

The multicollinearity test was conducted using the Tolerance and Variance Inflation Factor (VIF) values. All predictors had a Tolerance value of 0.632 (> 0.10) and a VIF of 1.581 (< 10), indicating no signs of multicollinearity among the independent variables. Therefore, the regression model statistically meets the assumption of predictor independence [75].

3.3. Regression Analysis

3.3.1 Multiple Linear Regression

Table 7. Multiple Linear Regression

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	4.995
H_1	0.776	0.601	0.594	3.184

The regression model yielded an Adjusted R^2 value of 0.594, indicating that 59.4% of the variance in OIBB can be explained by the independent variables eWOM and DoG. This corresponds to a large effect size ($f^2 = 1.46$), suggesting that the model accounts for a substantial portion of variance in the dependent variable [84]. The R value of 0.776 suggests a strong correlation [85] between the predictors and the dependent variable. Furthermore, the reduction in RMSE from 4.995 in the null model (H_0) to 3.184 in the alternative model (H_1) indicates that the model including both predictors has a lower prediction error.

3.3.2 F-Test (ANOVA)

Table 8. F-Test (ANOVA)

Model		SS	df	MS	F	P
H_0	Regression	1560.371	2	780.186	76.952	< .001
H_1	Residual	1034.143	102	10.139		
	Total	2594.514	104			

The ANOVA results show that eWOM and Deferment of Gratification (DoG) jointly exert a significant influence on OIBB, with an F value of 76.952 and $p < 0.001$. The Sum of Squares for the regression (1560.371) is statistically much larger than the residual value (1034.143), indicating a strong combined contribution of the two predictors in explaining the variation in OIBB.

3.3.3 T-Test

Table 9. T-Test

Model		Unstd.	SE	Std.	t	P
H_0	Inter.	24.629	0.487		50.527	< .001
H_1	Inter.	29.698	3.473		8.550	< .001
	DoG	-0.327	0.059	-0.433	-5.502	< .001
	eWOM	0.553	0.100	0.433	5.506	< .001

$$OIBB=29.698+0.553(eWOM)-0.327(DoG)$$

Figure 3. Regression Equation

The regression analysis results indicate that both DoG and eWOM have a significant partial effect on OIBB. DoG has a negative effect, with $\beta = -0.327$, $t = -5.502$, and $p < 0.001$, indicating that each one-unit increase in DoG reduces the OIBB score by 0.327 points. Conversely, eWOM shows a significant positive effect, with $\beta = 0.553$, $t = 5.506$, and $p < 0.001$, meaning that each one-unit increase in eWOM increases the OIBB score by 0.553 points. Both variables meet the partial significance requirement at the $p < 0.001$ level. Moreover, the standardized coefficients ($\beta = -0.433$ for DoG; $\beta = 0.433$ for eWOM) indicate medium-to-large effects of comparable magnitude but in opposite directions [84], underscoring that both predictors contribute substantially to explaining variations in OIBB.

4. DISCUSSION

The regression analysis results indicate that eWOM has a significant positive effect on OIBB ($\beta = 0.553$, $t = 5.506$, $p < 0.001$). Beyond statistical significance, the standardized coefficient for eWOM ($\beta = 0.433$) indicates a medium-to-large effect, highlighting its substantive role in shaping impulsive buying behavior. Practically, this suggests that even moderate exposure to peer reviews can meaningfully elevate consumers' likelihood of engaging in impulsive purchases. This finding is consistent with various prior studies. For instance, a study [86] involving 676 participants in Turkey using the SEM method found that eWOM positively influences online impulsive buying behavior, with a regression coefficient of $\beta = 0.418$, $t = 2.649$, $p = 0.008$. This suggests that consumers who share their experiences about a product or brand

can influence potential buyers' perceptions and purchasing decisions. Another study [87] on Adidas consumers in Surabaya revealed that participants actively read, write, and consider digital reviews before making a purchase. The regression analysis in that study reported an R^2 of 0.735, indicating that eWOM and other digital marketing variables (X1) explained 73.5% of the variance in impulsive buying behavior, with a strong correlation (0.824) between eWOM and impulsive buying. Similar findings were obtained in a study [88], among Shopee users in seven Indonesian provinces, which reported a predictive strength of $\beta = 0.161$, $t = 2.187$, $p = 0.029$ for eWOM's effect on OIBB, as well as in [89] study of 162 online skincare consumers, which found a predictive strength of $\beta = 0.391$, $t = 5.523$, $p < 0.001$ for the same relationship. Collectively, this evidence reinforces that consumer reviews and recommendations can enhance trust and drive rapid purchasing decisions [90], [91], [51], especially in fast-paced digital environments with high promotional intensity [59].

Conversely, DoG in this study was found to have a significant negative effect on OIBB ($\beta = -0.327$, $t = -5.502$, $p < 0.001$). This aligns with self-regulation and cognitive control theories, which view the ability to delay gratification as a key decision-regulation mechanism [92]. DoG represents a volitional capacity that enables individuals to postpone immediate pleasure in favor of more valuable long-term outcomes. In the context of online shopping, individuals with high DoG tend to evaluate the consequences of purchases more consistently, thereby resisting impulsive urges even in highly persuasive digital environments. Beyond psychological explanations, the negative association may also reflect situational or contextual influences, such as financial constraints [93], or competing purchase priorities, which can independently suppress impulsive purchases irrespective of dispositional self-control.

A further perspective is offered by neuroscience, which robustly associates higher DoG with enhanced executive control processes in brain regions such as the dorsolateral prefrontal cortex and anterior cingulate cortex [94]. While these mechanisms were not directly measured in the present study, they provide a scientifically grounded framework that enriches the interpretation

of our findings and points to promising directions for future research, particularly through neuropsychological or neuroimaging approaches. These findings are consistent with a study [95] reporting that individuals with a long-term orientation (consideration of future consequences) tend to exhibit lower impulsive buying tendencies, as well as with self-control theory [18], which emphasizes the importance of delaying gratification to prevent excessive consumerism. Overall, the moderately negative yet significant β value (–0.327) indicates that increasing DoG can effectively reduce OIBB. However, this negative effect may be contingent on boundary conditions such as product type, promotional intensity, or social influence strength. For instance, consumers with high DoG may still be vulnerable to impulsive purchases in contexts involving limited-time offers or strong group conformity pressures, suggesting the need for future research to test these moderating factors empirically. Importantly, this behavioral mechanism may interact with cultural contexts. In Indonesian e-commerce, for example, collectivist values and strong reliance on community trust networks can amplify the influence of eWOM, making peer recommendations a powerful driver of purchase decisions while simultaneously shaping how self-regulatory tendencies manifest in online shopping.

These results not only extend prior literature but also provide theoretical contributions by refining self-regulation theory, showing how delay of gratification operates in digital commerce settings shaped by persuasive cues and consumer-generated content, and by advancing marketing theory through clarifying the dual role of electronic word-of-mouth (eWOM) as both an informational and normative driver of impulsive buying. In practical terms, the findings highlight the value of interventions that strengthen self-regulation, such as financial literacy programs and long-term goal framing, alongside platform-level features like spending reminders or delayed checkout options to curb impulsive tendencies. For stakeholders, consumers can benefit from strategies that raise awareness of spending triggers, platform designers can adopt behavioral nudges such as customizable spending limits, and educators can incorporate impulse-control training into financial literacy curricula. Retailers, meanwhile, may pursue more responsible marketing approaches by balancing persuasive

promotions with transparent product information, thereby supporting sustainable consumer behavior without compromising business objectives.

5. CONCLUSION

This study shows that electronic word-of-mouth (eWOM) has a significant positive effect on online impulsive buying behavior (OIBB), while delay of gratification (DoG) has a significant negative effect on OIBB among Shopee-using university students in Greater Bandung. Theoretically, these findings contribute to the literature by integrating social influence (through eWOM) and self-regulation (through DoG) perspectives, thereby advancing understanding of how external and internal mechanisms jointly shape impulsive consumption in digital contexts. However, these findings should be interpreted with caution, given key methodological limitations. The cross-sectional design prevents causal inference, accidental sampling may have introduced selection bias and reduced representativeness, and the cultural specificity of the Indonesian context may limit broader applicability. To address these constraints, future research should employ longitudinal or experimental designs to strengthen causal claims, adopt probability-based sampling to enhance generalizability, and conduct cross-cultural studies to assess whether these psychological and social mechanisms hold across different market contexts.

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