



GREEN CHOICES IN E-COMMERCE: UNDERSTANDING CONSUMER WILLINGNESS TO PAY FOR ECO-FRIENDLY PACKAGING

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ABSTRACT

This study examines consumer behavior toward adopting eco-friendly packaging in Indonesia's e-commerce sector, contributing to the broader discourse on sustainable consumption in Indonesia. It analyzes the factors influencing consumers' willingness to pay for eco-friendly packaging using the Sustainability Theory of Planned Behavior (STPB). The study is driven by growing environmental concerns associated with e-commerce packaging waste, particularly in emerging markets such as Indonesia, where sustainability practices are still developing. Data were collected from 236 active online shoppers through purposive sampling, and structural equation modelling (SEM) was employed to analyze the relationships among key variables. The results demonstrate the significant influence of environmental concerns on consumer attitudes and the crucial role of behavioral intention in predicting willingness to pay for eco-friendly packaging. The findings further indicate that moral and environmental values play a more prominent role than economic considerations in shaping consumer behavior. These insights underscore the importance of public awareness campaigns, improved accessibility to eco-friendly packaging, and supportive government policies. By integrating sustainability dimensions into consumer behavior models, this study advances the theoretical understanding of sustainable consumption in e-commerce and offers practical recommendations for promoting environmental responsibility in emerging markets.

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INTRODUCTION

The e-commerce industry in Indonesia has emerged as one of the fastest-growing sectors in recent years. In 2023, this sector's gross merchandise value (GMV) reached US\$62 billion, contributing 75.6% to Indonesia's total digital economy. Bank Indonesia projects that this figure will continue to rise, reaching IDR 689 trillion by 2024, underscoring the significant role of e-commerce in driving this digital transformation. This growth is closely tied to internet penetration, which reached 79.5% of the population, or approximately 221 million users, in the same year. Advancements in information technology infrastructure, such as the development of fiber-optic networks and the introduction of 5G technology, have expanded e-commerce access to remote areas. Moreover, the COVID-19 pandemic accelerated consumers' shift from offline to online shopping, making digital platforms the primary alternative for fulfilling daily requirements.

However, behind the rapid growth of this sector lies a significant challenge in terms of its environmental sustainability. The high frequency of package deliveries has increased carbon emissions (Manerba et al., 2018; Pålsson et al., 2017; Van-Loon et al., 2015; Visser et al., 2014). Additionally, the use of plastic as the primary material for e-commerce packaging poses serious issues. Plastic packaging, often non-renewable and multilayered, has become a major contributor to waste generation (Anwar et al., 2024; Wang & Zhu, 2020). Data from the National Waste Management Information System show that plastic accounts for 19% of the total 18 million tons of waste generated in Indonesia annually, making it the second-largest waste contributor after food waste. This challenge is further exacerbated by the persistent nature of plastic, which is difficult to degrade, despite government policies aimed at reducing its use, such as the Ministry of Environment and Forestry Regulation No. P.75/MENLHK/SETJEN/KUM.1/10/2019.

In this context, the use of eco-friendly packaging has emerged as a potential solution to mitigate the negative environmental impacts of e-commerce activities (Arora et al., 2023; Coelho et al., 2020; Escursell et al., 2021; Mucowska, 2021). Eco-friendly packaging is designed using recyclable or renewable materials, is environmentally harmless, and supports closed-loop management systems. In addition to being environmentally friendly, such packaging maintains its core functionality as a protective measure (Ibrahim et al., 2022; Thøgersen et al., 2016), safeguarding product quality from external factors, promoting the product, conveying information, and providing convenience to consumers (Ranjan & Das, 2020). Eco-friendly packaging helps reduce carbon emissions and plastic waste and adds value to companies' products. Consumers tend to perceive companies that adopt eco-friendly packaging as socially and environmentally responsible (Fianda et al., 2021; Reddy et al., 2023).

Nevertheless, the adoption of eco-friendly packaging in Indonesia's e-commerce sector still faces significant challenges. Consumer preferences for cost efficiency and convenience often create a dilemma between the demand for affordable and fast shipping and the desire to support sustainable practices (Hao et al., 2019). Previous studies have indicated that although consumers are aware of the importance of sustainability, their willingness to support the use of eco-friendly packaging often depends on factors such as price, availability, and ease of access (Lan et al., 2023; Zheng et al., 2022).

Most existing studies focus primarily on the environmental (Coelho et al., 2020; Escursell et al., 2021; Grönman et al., 2013) and business benefits of using eco-friendly packaging (Maziriri, 2020; Wang & Zhu, 2020). However, research explicitly exploring consumers' willingness to adopt eco-friendly packaging in Indonesia's e-commerce sector remains scarce. As one of the largest e-commerce markets globally, consumer behavior in Indonesia plays a critical role in supporting sustainability initiatives. This study aims to address this gap by exploring the factors influencing Indonesian consumers' willingness to use eco-friendly packaging and their willingness to pay to support this initiative.

To address these questions, this study employs the Sustainability Theory of Planned Behavior (STPB), an extension of the Theory of Planned Behavior (TPB). The TPB has been widely utilized in consumer behavior research to analyze how attitudes, subjective norms, and perceived behavioral control influence the intention to act. However, STPB expands this model by incorporating sustainability dimensions: perceived environmental concern, perceived economic concern, and perceived authority support (Ong et al., 2023). Perceived environmental concern reflects an individual's awareness of environmental impacts and influences attitudes, personal norms, and behavioral control. Perceived economic concern relates to consumers' understanding of the economic benefits of eco-friendly packaging, such as long-term cost efficiency. Perceived authority support highlights the role of government policies or relevant institutions in promoting eco-friendly products through regulations or incentives.

Furthermore, this study examines how attitudes, personal norms, and perceived behavioral control influence consumers' intentions to use eco-friendly packaging, ultimately determining their willingness to pay for it. By integrating the STPB, this study contributes to the consumer behavior literature and provides practical insights for e-commerce companies and policymakers to design more effective sustainability strategies. Thus, this study is expected to serve as a crucial step in supporting efforts to reduce the environmental impact of Indonesia's rapidly growing e-commerce industry.

RESEARCH METHOD

This study adopted a quantitative explanatory design aimed at testing the causal relationships between latent variables derived from a theoretical framework. This research focuses on understanding consumer behavior regarding eco-friendly packaging using an extended version of the Theory of Planned Behavior (TPB), namely, the Sustainability Theory of Planned Behavior (STPB).

The STPB model integrates sustainability-related constructs, perceived environmental concern, perceived economic concern, and perceived authority support into the TPB framework. These constructs are expected to influence attitudes, personal norms, and perceived behavioral control, which in turn affect behavioral intention, ultimately determining the willingness to pay for eco-friendly packaging (Ong et al., 2023; Mahmoud et al., 2022; Müller et al., 2021; Wang et al., 2018). Based on this theoretical framework, the following hypotheses are proposed.

- H1: Perceived environmental concern has a positive effect on attitude toward eco-friendly packaging
- H2: Perceived environmental concern has a positive effect on personal norms
- H3: Perceived environmental concern has a positive effect on perceived behavioral control
- H4: Perceived economic concern has a positive effect on attitude toward eco-friendly packaging
- H5: Perceived economic concern has a positive effect on personal norms
- H6: Perceived economic concern has a positive effect on perceived behavioral control
- H7: Perceived authority support has a positive effect on attitude toward eco-friendly packaging
- H8: Perceived authority support has a positive effect on personal norms
- H9: Perceived authority support has a positive effect on perceived behavioral control
- H10: Attitude toward eco-friendly packaging has a positive effect on behavioral intention
- H11: Personal norms have a positive effect on behavioral intention
- H12: Perceived behavioral control has a positive effect on behavioral intention
- H13: Behavioral intention has a positive effect on willingness to pay for eco-friendly packaging.

These hypotheses collectively establish the foundation for testing the influence of sustainability perceptions and psychological factors on consumer behavioral outcomes in Indonesia’s e-commerce sector.

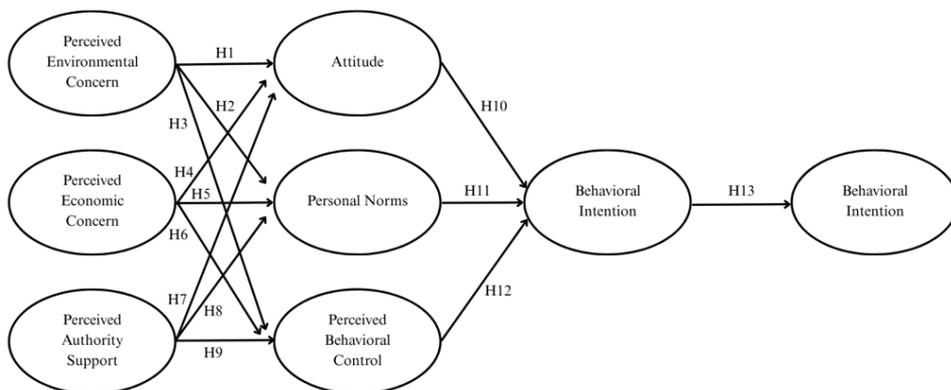


Figure 1. Conceptual Framework

To empirically test the proposed model and hypotheses, a structured questionnaire was developed based on previously validated items: three items for perceived environmental concern (Ong et al., 2023), one item for perceived economic concern (Ong et al., 2023), two items for perceived authority support (Ong et al., 2023), four items for attitude (Ong et al., 2023), three items for personal norm (Santos et al., 2021), four items for perceived behavioral control (Santos et al., 2021), three items for behavioral intention (Koch et al., 2022), and three items for willingness to pay (Koch et al., 2022). Responses were measured using a ranging from strongly disagree (1) to strongly agree (5).

Data were collected from May to August 2024 across Indonesia. The questionnaire was distributed via Google Forms across various social media platforms, such as Instagram, WhatsApp, and Facebook. Respondents were selected using purposive sampling, targeting individuals who had previously engaged in online shopping. As a result, 236 respondents met the criteria. Table 1 presents the respondents' characteristics.

Table 1. Respondent Profile

No	Characteristics	Frequency	%
1	Sex		
	Male	78	33
	Female	158	67
2	Age (Years Old)		
	15-25	172	72.9
	26-35	52	22
	36-45	7	3
	46-55	4	1,7
	56-65	1	0.4
3	Education		
	High School	152	64
	Diploma	6	3
	Undergraduate	56	24
	Postgraduate	20	8
	Others	2	1
4	Monthly Income (IDR)		
	< 1,000,000	122	52
	1,000,000 - 2,500,000	56	24
	2,500,000 - 4,000,000	26	11
	> 4,000,000	32	14
5	Frequency of Online Shopping per Month		
	<5 times	170	72
	5 - 10 times	43	18
	> 10 times	23	10

In this study, data were analyzed using Partial Least Squares structural equation modeling (PLS-SEM). This technique was selected based on several methodological considerations. First, PLS-SEM is suitable for prediction-oriented research that involves complex models with multiple latent constructs. Second, it is appropriate for studies with moderate sample sizes and does not require normally

distributed data. Third, the model includes reflective constructs and multistage mediation paths, which are well supported by the PLS-SEM framework.

In this study, PLS-SEM was used to examine the measurement and structural models. The measurement model was assessed using outer loading, composite reliability, Cronbach's alpha, average variance extracted (AVE), and discriminant validity (Fornell-Larcker and HTMT criteria). The structural model was evaluated by testing the path coefficients, p-values, effect size (f), and checking for multicollinearity using VIF values.

This method enabled the researchers to provide causal explanations of how sustainability perceptions, psychological mechanisms, and behavioral intentions collectively influence consumers' willingness to pay for eco-friendly packaging.

RESULT AND DISCUSSION

This section presents the analysis and results, starting with the measurement model evaluation, followed by the structural model evaluation.

Evaluation of Measurement Model

The measurement model in this study employed a reflective model approach, in which indicators were considered representations of the construct being measured. Thus, any change in the construct is reflected in the indicator values.

The measurement model was evaluated through four main steps: loading factor ≥ 0.70 ; Composite Reliability ≥ 0.70 ; Cronbach's Alpha; Average Variance Extracted ($AVE \geq 0.50$); and discriminant validity was assessed using two criteria: Fornell & Larcker Criterion and HTMT should be below 0.90. The results of the measurement model evaluation are presented in Table 2.

Based on the evaluation results, all variables in this study met the criteria for reliability and validity, as recommended by recent methodological literature. The Perceived Environmental Concern (PEC) variable, measured using three items, showed outer loadings ranging from 0.829 to 0.909. It demonstrated strong internal consistency, with a Cronbach's alpha of 0.846, Composite Reliability (CR) of 0.906, and Average Variance Extracted (AVE) of 0.762, surpassing the commonly accepted thresholds (Hair et al., 2021).

The Perceived Economic Concern (PECC) variable, measured by a single item with an outer loading of 1.000, fulfills reliability and validity requirements inherent to single-item measures, as discussed in recent studies on PLS-SEM modeling (Sarstedt et al., 2019).

The Perceived Authority Support (PAS) also demonstrated excellent reliability, with both items loading at 0.949, Cronbach's alpha of 0.888, Composite Reliability (CR) of 0.947, and an AVE of 0.900. Similarly, the Attitude (A) variable, measured with four items, had outer loadings between 0.790 and 0.845 and met the reliability standards with a Cronbach's alpha of 0.834, Composite Reliability (CR) of 0.889, and AVE of 0.667.

Table 2. Measurement Model Result

Variable	Measurement Items	Outer Loading	Cronbach's Alpha	Composite Reliability	AVE
Perceived Environment Concern	PEC1	0.829	0.846	0.906	0.762
	PEC2	0.909			
	PEC3	0.879			
Perceived Economic Concern	PECC1	1.000	1.000	1.000	1.000
Perceived Authority Support	PAS1	0.949	0.888	0.947	0.900
	PAS2	0.948			
Attitude	A1	0.825	0.834	0.889	0.667
	A2	0.790			
	A3	0.845			
	A4	0.805			
Personal Norms	PN1	0.871	0.813	0.890	0.730
	PN2	0.898			
	PN3	0.790			
Perceived Behavioral Control	PBC1	0.771	0.826	0.885	0.659
	PBC2	0.893			
	PBC4	0.717			
	PBC5	0.855			
Behavioral Intention	BI1	0.845	0.844	0.906	0.763
	BI2	0.882			
	BI3	0.893			
Willingness to Pay	WTP1	0.799	0.877	0.925	0.805
	WTP2	0.947			
	WTP3	0.939			

The Personal Norms (PN) is measured using three items with outer loadings ranging from 0.790 to 0.898. The constructs demonstrated strong internal consistency, with a Cronbach's alpha of 0.813, a Composite Reliability (CR) of 0.890, and an Average Variance Extracted (AVE) of 0.730. Perceived Behavioral Control (PBC), measured with four items, showed outer loadings ranging from 0.717 to 0.893 and was reliable with a Cronbach's alpha of 0.826, Composite Reliability (CR) of 0.885, and an AVE of 0.659 (Sarstedt et al., 2019).

Behavioral Intention (BI) was supported by three items with outer loadings between 0.845 and 0.893. It met the required criteria, with a Cronbach's alpha of 0.844, Composite Reliability (CR) of 0.906, and AVE of 0.763. Lastly, Willingness to Pay (WTP) was measured with three items, which had outer loadings ranging from 0.799 to 0.947. The reliability of this construct was excellent, as indicated by a Cronbach's alpha of 0.877, a Composite Reliability (CR) of 0.925, and an average variance extracted (AVE) of 0.805.

Discriminant validity was assessed using the Fornell-Larcker criterion and the HTMT (Heterotrait-Monotrait Ratio). According to Henseler et al. (2015), the Fornell-Larcker method confirms discriminant validity if the square root of each construct's AVE is higher than its correlations with other constructs. In this study, all the

constructs satisfied this condition. For example, the AVE square root for the attitude construct is 0.817, which is higher than its correlation with Behavioral Intention (0.651).

Further validation was performed using the HTMT approach, which is increasingly recommended in the recent literature because of its higher sensitivity. All HTMT values in this study were below the threshold of 0.90 (Hair et al., 2021), indicating no multicollinearity or overlapping constructs in the measurement model. Although the HTMT value between Perceived Behavioral Control and Personal Norms reached 0.910, this is still considered marginally acceptable in complex social behavioral models, as supported by recent empirical applications (Cheah et al., 2018).

These results collectively confirm that the measurement model is both reliable and valid, providing a robust basis for further structural-model analysis.

Table 3. Discriminant Validity

Fornell-Larcker Method								
	A	BI	PAS	PBC	PECC	PEC	PN	WTP
A	0.817							
BI	0.651	0.873						
PAS	0.304	0.328	0.948					
PBC	0.696	0.758	0.341	0.812				
PECC	0.436	0.339	0.190	0.397	1.000			
PEC	0.578	0.400	0.344	0.404	0.479	0.873		
PN	0.743	0.732	0.323	0.754	0.366	0.417	0.854	
WTP	0.415	0.506	0.208	0.510	0.254	0.230	0.452	0.897
HTMT Method								
	A	BI	PAS	PBC	PECC	PEC	PN	WTP
A								
BI	0.776							
PAS	0.354	0.379						
PBC	0.829	0.896	0.403					
PECC	0.476	0.369	0.202	0.441				
PEC	0.675	0.465	0.404	0.460	0.512			
PN	0.901	0.882	0.380	0.910	0.410	0.489		
WTP	0.481	0.584	0.237	0.591	0.269	0.256	0.525	

Overall, both methods demonstrated that the constructs in the research model met the requirements for discriminant validity, indicating that each variable in this study was theoretically distinct and empirically proven to be different. Table 3 presents the results in detail.

Evaluation of Structural Model

The evaluation of the structural model relates to the testing of the hypotheses proposed in this study. The evaluation was conducted in three stages. First, a multicollinearity test was performed using the Variance Inflation Factor (VIF) values to ensure that the predictor variables were not highly correlated. Second, the significance of the hypotheses was tested by analyzing the p-values and path coefficients to determine the significance and direction of the relationships between variables. Finally, the magnitude of the influence of the variables was measured using the f-square, which indicates the effect size of the independent variables on the

dependent variables. The complete results of this evaluation are presented in Table 4.

Table 4. Hypotheses Testing

Hypotheses	Path Coefficient	P Value	95% Confidence Interval for Path Coefficient		Result	VIF	F Square
			Lower Bound	Upper Bound			
PEC → A	0.442	0.001	0.159	0.664	Accepted	1.419	0.221
PEC → PN	0.248	0.061	-0.007	0.490	Not Accepted	1.419	0.057
PEC → PBC	0.205	0.121	-0.038	0.431	Not Accepted	1.419	0.040
PECC → A	0.202	0.002	0.074	0.033	Accepted	1.299	0.051
PECC → PN	0.210	0.006	0.072	0.350	Accepted	1.299	0.045
PECC → PBC	0.257	0.000	0.110	0.389	Accepted	1.299	0.069
PAS → A	0.114	0.046	-0.007	0.210	Accepted	1.135	0.018
PAS → PN	0.198	0.004	0.059	0.314	Accepted	1.135	0.046
PAS → PBC	0.222	0.002	0.088	0.356	Accepted	1.135	0.059
A → BI	0.105	0.144	-0.031	0.245	Not Accepted	2.468	0.012
PN → BI	0.318	0.000	0.180	0.461	Accepted	2.946	0.095
PBC → BI	0.446	0.000	0.301	0.564	Accepted	2.562	0.215
BI → WTP	0.506	0.000	0.406	0.617	Accepted	1.000	0.344

The first step in the structural model evaluation was to assess multicollinearity among the predictor variables by examining their Variance Inflation Factor (VIF) values. All VIF values in this study ranged from 1.000 to 2.946, which are well below the commonly accepted threshold of 5.0, indicating that no serious multicollinearity issues were present (Hair et al. 2021). This result suggests that the predictor variables are not excessively correlated, thereby ensuring the robustness of the parameter estimates and the validity of the structural paths in the model. Maintaining low multicollinearity is essential to avoid the inflation of standard errors and ensure the stability and interpretability of the regression coefficients within the PLS-SEM framework (Sarstedt et al., 2019).

The next step was hypothesis testing, which reviewed the path coefficients and p-values to examine the relationships between variables. A hypothesis was considered significant if the p-value was less than 0.05. The findings of this study revealed that most of the proposed relationships in the theoretical model were significant, with ten of the 13 hypotheses accepted. Figure 2 shows the details of the proposed method.

The test results indicate that Perceived Environmental Concern significantly influences attitude (path coefficient = 0.442; p-value = 0.001) but not Personal Norms and Perceived Behavioral Control. This suggests that consumers aware of the environmental damage caused by plastic waste tend to have positive attitudes toward eco-friendly packaging. This attitude reflects the perception that eco-friendly

packaging is a responsible action that supports environmental conservation. These findings align with those of Ong et al. (2023), who identified environmental concerns as a key driver of pro-environmental attitude formation.

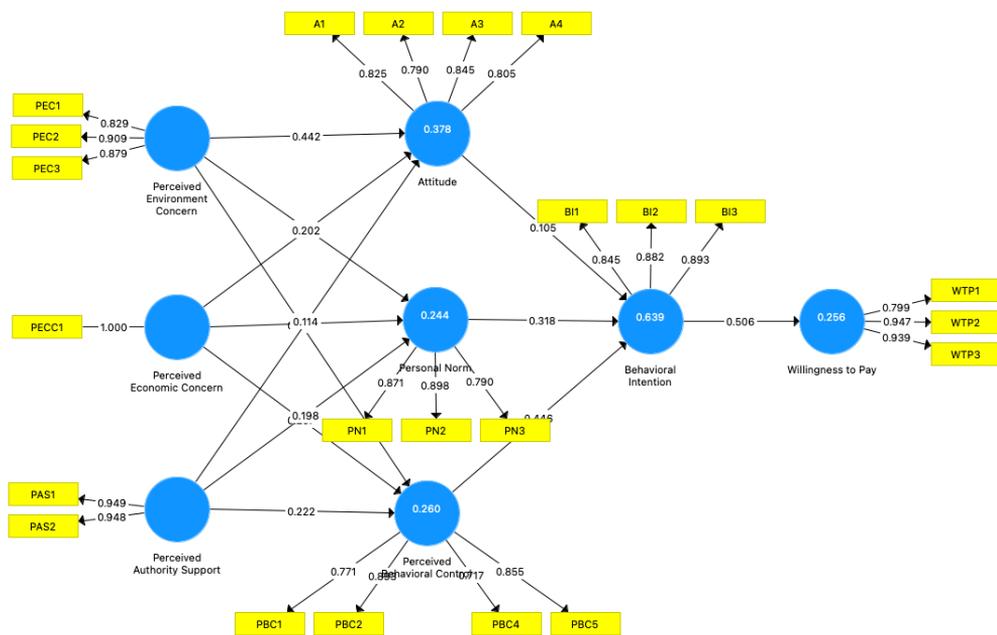


Figure 2. Model Testing Results

Perceived Economic Concern significantly influenced attitude (path coefficient = 0.202; $p = 0.002$), Personal Norms (path coefficient = 0.210; $p = 0.006$), and Perceived Behavioral Control (path coefficient = 0.257; $p = 0.000$). These results indicate that consumers who recognize the economic benefits of eco-friendly packaging, such as long-term cost efficiency, tend to have more positive attitudes. Moreover, these economic benefits enhance consumers' sense of moral responsibility and belief in their ability to support sustainability. This finding aligns with Pan et al. (2022), who highlighted the critical role of economic benefits in driving sustainability adoption, particularly in the e-commerce sector. However, while economic benefits are important in the Indonesian context, moral and social values remain the dominant drivers of sustainability efforts.

The results of the study indicate that Perceived Authority Support has a significant influence on attitude (path coefficient = 0.114; p -value = 0.046), Personal Norms (path coefficient = 0.198; p -value = 0.004), and Perceived Behavioral Control (path coefficient = 0.222; p -value = 0.002). Support from authorities, such as the government or relevant institutions, is crucial for shaping consumer trust and engagement with eco-friendly packaging. Policies such as subsidies or incentives for producers and users of eco-friendly packaging legitimize consumer choices, encouraging positive attitudes and personal norms to support sustainability. Ong et al. (2023) emphasized that authority support gives consumers a sense of security, ensuring that their actions align with broader sustainability goals.

Attitude does not have a significant influence on Behavioral Intention (path coefficient = 0.105; p-value = 0.144), whereas Personal Norms and Perceived Behavioral Control show significant influences with path coefficients of 0.318 (p-value = 0.000) and 0.446 (p-value = 0.000), respectively. The lack of significance in the effect of attitude on behavioral intention suggests that a positive attitude alone is insufficient to drive consumers to take concrete actions, particularly in the context of sustainability in emerging markets like Indonesia. External factors, such as ease of access and availability of eco-friendly packaging, play a more significant role in influencing consumer decisions. This finding is supported by Thi-Thanh et al. (2018), who highlighted the critical role of external environmental factors in encouraging pro-environmental actions.

Conversely, Personal Norms and Perceived Behavioral Control demonstrated strong relationships with behavioral intention, affirming that consumers' sense of moral responsibility and perceived ability are key driving factors. Consumers who feel they have control over their choices and recognize their moral responsibility to support sustainability are more likely to take action.

The relationship between Behavioral Intention and Willingness to Pay shows a highly significant influence (path coefficient = 0.506; p-value = 0.000), with an f-square value of 0.344, approaching the high category. This indicates that behavioral intention is the primary predictor of consumers' willingness to pay more for sustainability. The findings affirm that consumers with strong intentions to support eco-friendly packaging are likely to demonstrate tangible commitment through their willingness to pay for it. This aligns with the study by Zheng et al. (2022), which highlights that firm behavioral intention is a key driver of consumers' willingness to pay for sustainable products, including eco-friendly packaging.

This study reveals that sustainability factors, such as Perceived Environmental Concern, Perceived Economic Concern, and Perceived Authority Support, play a crucial role in shaping consumers' attitudes, personal norms, and behavioral control toward eco-friendly packaging. Behavioral Intention has been shown to be the most significant mediator influencing Willingness to Pay, highlighting the importance of facilitating and strengthening consumers' behavioral intentions.

Theoretical and Practical Implications

The findings of this study provide a significant theoretical contribution to the development of the Sustainability Theory of Planned Behavior (STPB) by demonstrating how sustainability factors, such as Perceived Environmental Concern, Perceived Economic Concern, and Perceived Authority Support, shape consumer behavior in emerging markets. The insignificance of the relationship between Attitude and Behavioral Intention offers new insights, showing that consumers' positive attitudes toward eco-friendly packaging are not always sufficient to drive concrete actions. This underscores the critical role of external factors, such as the ease of access and availability of eco-friendly products, which may moderate the relationship between attitude and behavioral intention.

Furthermore, the finding that Behavioral Intention is the most significant predictor of Willingness to pay reinforces the position of behavioral intention as a central mediating element in the STPB model. Thus, this study extends the scope of STPB by emphasizing the importance of the interactions between sustainability dimensions and the context of emerging markets, offering a more comprehensive

framework for understanding the dynamics of consumer behavior in supporting sustainability.

These findings provide strategic insights for e-commerce companies and policymakers to promote the adoption of eco-friendly packaging. It is crucial for companies to raise consumer awareness about the environmental impact of plastic packaging and the sustainability benefits of eco-friendly alternatives to plastic. Educational campaigns emphasizing consumers' contributions to reducing plastic waste can enhance their positive attitudes and personal norms toward sustainable practices. Additionally, companies should ensure that eco-friendly packaging is easily accessible and offered at a competitive price. Providing extra incentives, such as reward points, discounts, or symbolic recognition for consumers who choose eco-friendly packaging, can strengthen their behavioral intentions and increase their willingness to pay. These measures will make it easier for consumers to make sustainable decisions, especially when they feel they have control over their choices.

Government support is also a key element that cannot be ignored. Proactive public policies, such as providing subsidies to eco-friendly packaging manufacturers or offering tax reductions to e-commerce companies that promote sustainability, can strengthen the legitimacy of eco-friendly products in the market. Additionally, the government can introduce regulations to encourage sustainability standards in the e-commerce industry, such as mandating eco-friendly packaging or requiring companies to report their environmental impact. Integrated public education programs, in collaboration with private-sector initiatives, can create a broader collective awareness of the importance of sustainability. Such efforts would incentivize businesses to adopt sustainable practices and empower consumers to make environmentally conscious decisions.

For the community, these findings highlight the need for a value-based approach grounded in moral principles and social responsibility to encourage sustainable behaviors. Consumers need to be empowered with clear and easily understandable information about the benefits of using eco-friendly packaging for the environment and future generations. Conversely, collaboration among companies, the government, and society can foster a sustainable ecosystem that supports the reduction of environmental impacts from e-commerce activities. This collective effort can ensure that sustainability becomes an integral part of everyday decision-making, benefiting all stakeholders.

By implementing strategies aligned with these findings, the adoption of eco-friendly packaging is expected to increase significantly, supporting the sustainability of the e-commerce industry and contributing to environmental conservation in Indonesia. These findings provide evidence-based and measurable guidance for broader sustainability efforts in the e-commerce sector and other industries with similar potential environmental impacts.

CONCLUSION

This study successfully identified the factors influencing consumers' willingness to adopt eco-friendly packaging in Indonesia's e-commerce sector. The results revealed that Perceived Environmental Concern significantly influenced consumers' attitudes toward eco-friendly packaging, with a path coefficient of 0.442, emphasizing the importance of environmental awareness in shaping positive

attitudes. However, Perceived Environmental Concern did not significantly influence personal norms or perceived behavioral control, indicating that environmental awareness primarily shapes evaluative attitudes rather than directly strengthening moral obligation or perceived capability. Behavioral Intention was the primary and highly significant predictor of Willingness to Pay, with a path coefficient of 0.506, affirming the direct relationship between behavioral intention and the Willingness to Pay more for sustainability. Meanwhile, Perceived Economic Concern significantly influenced attitudes, personal norms and perceived behavioral control, indicating that economic considerations function as an enabling factor in strengthening consumers' evaluation, moral responsibility, and perceived ability to support eco-friendly packaging. This study also highlights the critical role of Perceived Authority Support, which significantly shapes attitudes, personal norms, and behavioral control, reflecting the importance of policies and authority support in fostering sustainability adoption. Interestingly, Attitude did not significantly influence Behavioral Intention, suggesting that positive evaluations alone are insufficient to translate sustainability awareness into concrete behavioral intentions. Using the Sustainability Theory of Planned Behavior (STPB) framework, this study provides a theoretical contribution to understanding consumer behavior related to sustainability, particularly in emerging markets.

Based on these findings, educational campaigns emphasizing the positive impact of eco-friendly packaging on reducing plastic waste are essential for enhancing consumer awareness and attitudes. E-commerce companies should provide accessible and affordable eco-friendly packaging while offering incentives, such as reward points or discounts, to encourage sustainability adoption. Additionally, the government must play an active role through supportive policies, such as subsidies for eco-friendly packaging manufacturers, tax reductions for companies promoting sustainability, and mandatory regulations on the use of eco-friendly packaging in the e-commerce sector. These measures will not only enhance consumers' behavioral intentions but also create a sustainability ecosystem that supports the reduction of environmental impact from e-commerce activities. A collaborative effort between the government, industry, and society is crucial to accelerating the adoption of eco-friendly packaging and supporting comprehensive sustainability initiatives.

AUTHOR CONTRIBUTION STATEMENT

[Author 1]: Conceptualization, methodology, data collection, analysis, and writing-original draft preparation; [Author 2]: Supervision, data collection, conceptual feedback, and writing-review & editing; [Author 3]: Validation, discussion of results, and manuscript review.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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ETHIC STATEMENT

Ethical review and approval were waived for this study as it involved a voluntary survey among general respondents and posed no more than minimal risk. All participants were informed about the purpose of the study and provided their consent prior to participation. The confidentiality and anonymity of participants were strictly maintained, and all data were used solely for academic and research purposes.

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