Beyond Green Packaging: Unveiling the Dynamics of Environmental Consciousness and Sustainable Consumption in Yogyakarta

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Abstract: Amid increasing concerns about plastic pollution and its negative impact on ecosystems, this research explores the relationship between environmental consciousness and the desire of urban consumers in Yogyakarta City to purchase products with eco-friendly packaging. Using the Theory of Planned Behavior (TPB) as a foundation, we aim to unveil the factors influencing consumer preferences toward sustainable packaging alternatives. Through a quantitative approach, this study involved 150 respondents who were selected purposively, with data analysis utilizing Structural Equation Modeling (SEM). Findings indicate a significant relationship between environmental consciousness and positive consumer attitudes towards sustainable packaging, emphasizing the crucial role of environmental consciousness in driving preferences for eco-friendly options. However, consumer attitudes alone do not directly increase the willingness to purchase these products. Instead, subjective norms and perceived behavioral control emerge as the primary determinants, highlighting the strong influence of social pressure and personal efficacy beliefs on sustainable purchasing decisions. This study not only contributes to the theoretical discourse on consumer behavior in environmental sustainability but also offers practical insights for policymakers, businesses, and environmental campaigns in promoting a culture of sustainable consumption through effective communication strategies, policy interventions, and market-based solutions.

Keyword: environmental consciousness, eco-friendly packaging, consumer behavior, sustainable consumption, theory of planned behavior

INTRODUCTION

In the last decade, global awareness of environmental protection has increased significantly, mainly due to concerns over the negative impact of non-biodegradable packaging waste (Moshood et al., 2022; Ncube et al., 2020), has encouraged consumers and industry to consider more sustainable alternatives. A report by National Geographic (2023), which revealed the existence of more than 5.25 trillion pieces of plastic waste in the ocean, as well as Plastics Europe data (2023) about the surge in global plastic production, it not only lays out the scale of this problem but also emphasizes the significant contribution of plastic packaging, with 40% of the total plastic production used for packaging (European Environment Agency, 2023). Adopting eco-friendly packaging solutions is increasingly urgent to reduce environmental pollution (Shaikh & Hyder, 2023). This increase not only underscores the direct impact on marine ecosystems and the environment in general but also triggers a consumer response that increasingly prefers products with packaging that has a low impact on the environment. Therefore, this study will explore how growing environmental consciousness influences consumer behavior, particularly when choosing environmentally friendly packaging to support environmental sustainability.

Increased awareness of the negative impact of packaging on the environment has sparked a recent study to explore consumer propensity toward eco-friendly packaging and its implications for environmental sustainability (Cammarelle et al., 2021; Hao et al., 2019; Mahmoud et al., 2022; Moorthy et al., 2021; Shaikh & Hyder, 2023). These studies are supported by evidence from previous surveys, signaling a movement towards greater ecological awareness among consumers. This movement, often called the "green revolution," reflects a strong desire to stop the trend of continued environmental destruction (Gall, 2022). As this awareness increases, consumers are more willing to adjust their purchasing and consumption habits to support improved sustainability and environmental stewardship (Ogiemwonyi et al., 2023). These changing consumer behaviors integrate environmental issues into their lifestyle considerations, where purchasing decisions are based not only on personal needs but also on consideration of their impact on the natural environment (Andika et al., 2023, 2024; Anisah et al., 2024; Luthfiana et al., 2024). By choosing environmentally responsible products, consumers contribute to reducing their ecological footprint and encourage companies to adopt more sustainable production and packaging practices (Boz et al., 2020), marking a shift towards more conscious and responsible consumption that has the potential to have a long-term positive impact on environmental conservation.

In Indonesia, although awareness of the importance of eco-friendly packaging has increased, it was found that only 20% of Indonesians actively checked the feasibility of recycling product packaging. In comparison, another 60% admitted they had never done so (Herdman & Rahmanto, 2021). This shows a stark discrepancy between pro-environmental attitudes and actual consumption behavior. This discrepancy further widens the gap between the aspiration to reduce negative impacts on the environment and the reality of increasing the volume of plastic waste, which indirectly places Indonesia as one of the countries contributing the most plastic waste to the world's oceans (Mutia, 2022). Factors such as consumer skepticism towards the quality of products with eco-friendly packaging and higher prices compared to products made from conventional packaging, especially among urban consumers (Herdiansyah et al., 2022), pose significant barriers to the adoption of more responsible purchasing behaviors (Boz et al., 2020; Pålsson & Sandberg, 2022). Therefore, exploring and identifying the factors that influence the decision of urban consumers in Indonesia to choose products with sustainable packaging is very important.

The city of Yogyakarta, often dubbed as the heart of Javanese culture, plays an essential role in Indonesia's history, education, and tourism. Yogyakarta has developed into an economic and cultural center known as the "City of Students" due to its abundant higher education institutions and large student population. Over the past decade, rapid urbanization

has signaled a massive migration to the city, driven by the search for better educational opportunities (Rizqiyah, 2023). However, this urbanization process also brings challenges, especially regarding waste management. Yogyakarta City faces severe challenges in waste management, with a volume reaching 250 tons per day while the quota for disposal to the Piyungan Transition Phase 2 landfill is limited to a maximum of 210 tons per day (Ria, 2023), where the proportion of plastic waste is quite significant reaching 23.84% (Ristiyono, 2023). This shows the urgent need to step up efforts to encourage sustainable consumption.

This research focuses on the influence of Environmental consciousness on consumer behavior in the context of choosing environmentally friendly packaging, using the lens of Planned Behavior Theory (TPB) (Ajzen, 1991). Environmental consciousness, manifested in knowledge and concern for environmental issues (Yang et al., 2024), drives consumer attitudes in choosing environmentally friendly packaging. In line with the TPB, these attitudes influence consumers' buying willingness as a proxy for intent to act. In contrast, more environmentally conscious individuals tend to see positive benefits in choosing sustainable packaging (Nguyen, 2023). The research also explores the role of subjective norms, which reflect social and cultural influences on consumer purchase willingness (Bravo & Vieira, 2024), as well as behavioral control perception, which assesses factors such as availability, price, and information in consumers' ability to make sustainable choices (Moorthy et al., 2021). Thus, the integration of Environmental consciousness within the TPB framework aims to provide a deeper understanding of how these psychological and social factors interact to shape sustainable consumption behavior, especially consumers' willingness to purchase products with environmentally friendly packaging in Yogyakarta City.

The importance of this study mainly lies in a comprehensive exploration of how Environmental consciousness, along with factors such as attitudes, subjective norms, and perceptions of behavioral control, affect consumers' willingness to purchase environmentally friendly packaged products in Yogyakarta City. The critical question is about the interaction between these elements in Yogyakarta's urban context and how they contribute to sustainable consumption behavior. The results of this study are relevant not only to policymakers and environmental program designers seeking more effective strategies to support sustainable consumption but also to industries tailoring their products and marketing strategies. In addition, the findings are expected to stimulate further discussion and research on sustainable consumer behavior, opening up opportunities for innovation in both theory and practical application in environmental conservation efforts.

METHOD

This study uses a quantitative approach and descriptive design to explore the willingness of consumers in Yogyakarta City to buy products with environmentally friendly packaging. Facing the uncertainty of the number of consumers willing to purchase products with eco-friendly packaging, we adopted the sample size determination formula recommended by Hair et al. (2017). The formula suggests a sample size of 5-10 times the number of research indicators; thus, based on the 23 indicators involved, the minimum sample required is 115, and the maximum is 230. For this study, we selected 150 respondents using purposive sampling techniques, with two specific criteria: respondents must be residents of Yogyakarta City and at least 17 years old. The questionnaire we used was hosted on Google Forms and disseminated through the researcher's WhatsApp app. Responses to the questionnaire were graded using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." Furthermore, the collected data were analyzed using the Partial Least Squares (PLS) technique within the Structural Equation Model (SEM) framework. Our evaluation process includes four essential stages: measurement model assessment (Common method bias check), measurement model analysis (outer model), structural model analysis

(inner model), and path coefficient analysis, all following the guidelines set by Kock (2015) and Hair et al. (2017).

RESULTS AND DISCUSSION

Table 1 details the demographic characteristics of the survey participants, including their gender, age range, education level, income, and marital status. Of the 150 respondents, it was revealed that the majority were women, with a proportion reaching 57%. The largest age group is those aged between 17 and 26, who accounted for 69% of the total respondents. In the education aspect, it was found that 61% of respondents had completed education up to the high school level. Regarding income, groups below 1 stand out for their diversity, making up 35% of the sample. Interestingly, 79% of respondents are single. This overall distribution provides a clear picture of the demographics of consumers who tend to choose eco-friendly packaging products in Indonesia, providing valuable insight into their preferences.

Table 1. Characteristics of Respondents

Category	Subcategory	Frequency	%
Gender	Male	65	43%
	Female	85	57%
Age	17-26	103	69%
	27-42	27	18%
	43-58	11	7%
	>58	9	6%
Education Level	High School	92	61%
	Diploma I-IV/S1	41	27%
	Master's	13	9%
	Doctoral Degree	4	3%
Income Level	Rp <1 million	52	35%
	Rp 1 million-2,5 million	39	26%
	Rp 2,5 million-5 million	38	25%
	Rp >5 million	21	14%
Status	Single	118	79%
	In Relationship	26	17%
	Divorce	6	4%

Common method bias check

This study used the Smart-PLS version 3 application as the main structural measurements and analysis instrument. The application proved effective in addressing the problem of abnormal data distribution, a common challenge in social science studies (Hair et al., 2019). Based on a recent literature review, we begin with a critical evaluation of potential methodological bias. Our analytical steps include researching the interdependencies between variables to identify and address collinearity issues that can arise from data derived from the same source. By applying the PLS-SEM methodology—stated by Kock (2015) as superior to Harmon's single-factor technique, especially in the context of the assumed variance of his method—we investigated collinearity in detail. This process includes cross-regression examination between variables, where a Variance Inflation Factor (VIF) value lower than 3.3 indicates the absence of bias caused by data from identical sources (Kock, 2015). The results shown in Table 2, with VIF values below these limits, effectively confirm that possible bias from using a single data source does not affect the accuracy of our data analysis.

Analysis of the outer model

In the advanced analysis phase, this study evaluates the outer model to test the validity and reliability of the measurement elements applied. The convergent validity evaluation examines the *outer loading* value in detail, following the criteria outlined by Hair et al. (2017). This process eliminates items with *outer loading* values below the 0.5 threshold to achieve optimal Variance Inflation Factor (VIF) values. The data presented in Table 2 show that all indicator items meet the minimum values with *outer loading values* greater than 0.5, signaling precise measurements. In addition to examining *outer loading* values, this study assessed convergent validity through Average Variance Extracted (AVE) values, where AVE values over 0.50 indicate strong validity (Hair et al., 2017). Based on the information in Table 2, AVE values range from 0.556 to 0.681, indicating that the construct, on average, accounts for more than half of the variance of the indicator. For variable reliability analysis, we look to Composite Reliability (CR) values that result in values between 0.838 and 0.896, exceeding the minimum limit of 0.70, an indicator of solid reliability (Hair et al., 2017).

Table 2. Results of the Indicator Test and Common Method Bias

Construct	Item	Outer Loading	Composite	AVE	VIF
Environmental Consciousness	EC1	0.771	0.896	0.632	1.883
	EC2	0.839			2.374
	EC3	0.813			2.034
	EC4	0.759			1.929
	EC5	0.791			2.033
Consumer Attitude	CA1	0.774	0.838	0.633	1.413
	CA2	0.746			1.403
	CA3	0.862			1.404
Subjective Norms	SN1	0.643	0.882	0.556	1.396
	SN2	0.675			1.57
	SN3	0.738			2.303
	SN4	0.773			2.32
	SN5	0.818			2.1
	SN6	0.811			2.102
Perceived Behavior Control	PBC1	0.803	0.894	0.586	2.399
	PBC2	0.784			2.092
	PBC3	0.776			2.206
	PBC4	0.744			2.477
	PBC5	0.822			2.149
	PBC6	0.653			1.998
Willingness to Buy	WTP1	0.787	0.865	0.681	1.464
	WTP2	0.871			1.638
	WTP3	0.816			1.634

Furthermore, to test reliability in distinguishing between assessment items, this study utilizes the Heterotrait-Monotrait (HTMT) method as an evaluation framework. This method was adopted in response to criticism of the Fornell-Larcker reliability criterion. On the advice of Henseler et al. (2015), The HTMT matrix was introduced as a more effective alternative to evaluate discriminant validity through comparison of HTMT correlation ratios. HTMT values below 1.0 are interpreted as a relatively strong indicator of discriminant validity (Henseler et al., 2015). The results of our analysis, presented in Table 3, show that all HTMT values are below the 1.0 threshold, which signals success in ensuring the validity of significant discriminants between the constructs studied. Therefore, the study successfully met the established standards of convergent, discriminant, and reliability validity of composites.

Table 3. HTMT Test Results (Discriminant validity)

	1	2	3	4
Consumer Attitude				
Environmental consciousness	0.688			
Willingness to Buy	0.581	0.945		
Perceived Behavioral Control	0.722	0.966	0.823	
Subjective Norms	0.89	0.781	0.803	0.872

Analysis of the inner model

After meeting the outer model evaluation standards, the next stage is to conduct an inner model analysis. For this evaluation, we refer to the framework recommended by Hair et al. (2019), which aims to verify the effectiveness and relevance of the model. This internal evaluation involves reviewing various metrics, such as R-square, Q-square, SRMR (Standardized Root Mean Square Residual), and linearity tests.

Interpret R-squared values based on criteria set by Hair et al. (2011); we can identify different levels of influence: 0.25 indicates a minimal influence, 0.50 indicates a moderate influence, and 0.75 indicates a significant influence. The R-squared analysis in Table 4 shows that Environmental consciousness has minimal influence on consumer attitudes, with a value of 0.313. Furthermore, when combining consumer attitudes, subjective norms, and perceptions of behavioral control, we find that these factors moderately impact purchasing preferences for sustainable products with eco-friendly packaging, recorded at 0.526. In addition, the understanding of Q-squared, introduced by Hair et al. (2019), also offers a separation of the level of influence into minimal at 0, medium at 0.25, and high at 0.50. From the analysis results shown in Table 4, the Q-squared value for consumer attitudes related to Environmental consciousness is 0.182, reflecting minimal influence. The Q-squared value for the combined influence of consumer attitudes, subjective norms, and perceptions of behavioral control on buying willingness was recorded at 0.336, indicating that the level of prediction accuracy was in the moderate category.

Furthermore, to assess the model's suitability using the PLS-SEM method, the application of SRMR analysis becomes crucial. The primary purpose of this analysis is to detect any errors in the determination of the model by setting a limit of values that indicate good conformity. An SRMR value of less than 0.10 is considered an indication supporting optimal model fit (Henseler et al., 2015). The results presented in Table 4 show an SRMR value of 0.093, indicating that the model meets the conformity criteria with existing data.

Table 4. R2, Q2, and SRMR Test Results

|	R^2	Q^2	SRMR
Consumer Attitude	0.313	0.182	0.093
Willingness to Buy	0.526	0.336	

Last, Hair et al. (2019) emphasize the importance of assessing linearity in SEM-PLS analysis. Linearity refers to the proportional relationship between independent and dependent variables, which is the basic assumption of this research model. To test this assumption, this study examines the quadratic form of variables such as Environmental consciousness, consumer attitudes, subjective norms, and perceived behavioral control over the willingness to buy products with environmentally friendly packaging. This evaluation process involves examining the impact of the variables' quadratic form on the model's stability. In Table 5, the results showed that the squared shape of these variables had no significant effect on willingness to purchase products with eco-friendly packaging, which verifies the assumption of linearity in the relationship of these study variables.

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Table 5. Linearity Test Results
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	Original Sample	T Statistics	P Values
Quadratic Effect EC -> CA	0.036	0.639	0.523
Quadratic Effect CA -> WTP	0.015	0.329	0.742
Quadratic Effect SN -> WTP	0.038	0.685	0.493
Quadratic Effect PBC -> WTP	-0.024	0.419	0.676

Hypothesis testing

This section details the interactions among various constructs and provides insight into the relationships between variables. The values shown in Table 6 are generated through the bootstrapping method with 5,000 resampling iterations, according to the suggestion from Hair et al. (2017). For this study, the threshold value for t-statistics used was 1.96, with a two-sided measurement approach and a significance level of 5%, following the recommendations of Hair et al. (2021). Analysis of the direct influence hypothesis test showed that only hypothesis 2 in this study was not confirmed.

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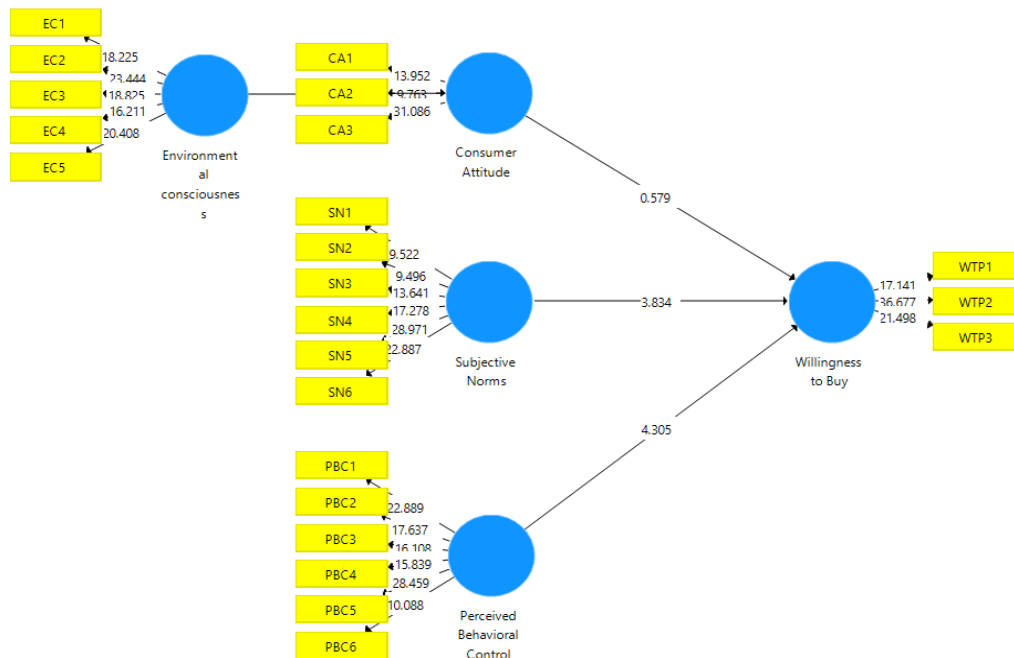
Figure 1. Bootstrapping Results

Table 6. Hypothesis Test Results
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		Original Sample	Std Deviation	T Statistics	P Values	Conclusion
H1	EC -> CA	0.559	0.049	11.414	0.000	Accepted
H2	CA -> WTP	-0.047	0.082	0.579	0.563	Rejected
H3	SN -> WTP	0.414	0.108	3.834	0.000	Accepted
H4	PBC -> WTP	0.39	0.090	4.305	0.000	Accepted

The results of hypothesis testing outlined in Table 6 offer exciting insights into the dynamics of relationships between the variables studied. Initially, the first hypothesis (H1) succeeded in proving the significant influence of Environmental consciousness on consumer attitudes, with a path coefficient (β) reaching 0.559 and a very high level of significance (p < 0.000). Furthermore, the second hypothesis (H2) revealed that consumers' attitudes did not have a significant influence on their desire to buy, evidenced by a path coefficient (β) of -0.047 and a p-value indicating insignificance (> 0.563). Then, the third hypothesis (H3) again

found a significant influence from subjective norms on buying intentions. The β value is 0.414 and has a very high significance level (p < 0.000). Finally, the fourth hypothesis (H4) highlights the significant influence of perceived behavioral control on CA, with a β value of 0.39 and a very high level of significance (p < 0.000).

Discussion

The results of the first hypothesis testing show that Environmental consciousness significantly affects positive consumer attitudes. This confirms how crucial Environmental consciousness is in shaping consumers' positive attitudes towards products with sustainable packaging. This finding is in line with the results of the study by Khaleeli & Jawabri (2021), Fauzan & Azhar (2020), and Oliver et al. (2023), which shows that Environmental consciousness has a positive and significant effect in shaping positive consumer attitudes toward products with sustainable packaging. Based on these findings, policymakers and environmental program designers in Yogyakarta City can take strategic steps by increasing education and communication efforts about the importance of sustainable packaging to the community. This can be done through public campaigns, workshops, and collaborations with local communities and social media to disseminate information about the benefits of sustainable packaging for the environment and health. In addition, the government and relevant stakeholders can encourage innovation in developing more environmentally friendly packaging and provide incentives for companies that apply ecodesign principles in their production. Thus, synergy can be created between increasing public Environmental consciousness and government policy support, accelerating the transition to sustainable packaging product consumption in Yogyakarta City.

However, the results of testing the second hypothesis show that consumer attitudes do not significantly affect the willingness to buy products with environmentally friendly packaging. A positive attitude towards the environment does not necessarily encourage consumers to make sustainable purchases. This finding differs from the results of previous studies from Moorthy et al. (2021) and Bravo & Vieira (2024), which show that positive consumer attitudes have a significant direct relationship with the intention to buy environmentally friendly packaging products. Based on these findings, several factors can explain why a positive attitude towards the environment only sometimes encourages the purchase of products with environmentally friendly packaging in Yogyakarta City. One possibility is that there are practical barriers faced by consumers, such as limited accessibility of such products, relatively higher prices compared to conventional products, or a lack of information about the real benefits of sustainable products. This requires policymakers and environmental program designers to not only focus on increasing Environmental consciousness but also pay attention to the affordability and availability of sustainable products. Effective strategies include cross-subsidizing green products, working with local producers to increase the production and distribution of sustainable products, and more profound education campaigns about the long-term benefits of sustainable consumption. A holistic approach and focusing on practical solutions can reduce the gap between positive attitudes towards the environment and sustainable purchasing behavior, supporting the creation of a more sustainable consumption ecosystem in Yogyakarta City.

Furthermore, testing the third hypothesis shows that subjective norms significantly affect the willingness to buy environmentally friendly packaging products. This confirms the crucial role of social pressure or support in consumer purchasing decisions. The results of this study align with the findings of Guo et al. (2023) and Cammarelle et al. (2021), which show that subjective norms have a significant and positive impact on the purchase intention of environmentally packaged products. Based on these findings, policymakers and environmental program designers in Yogyakarta City can integrate strategies that utilize subjective norms to promote the consumption of products with sustainable packaging. For

example, public awareness campaigns highlighting sustainable consumption behavior as a desirable social norm can influence consumer perceptions and behavior. This campaign can involve community leaders, influencers, and educational institutions to spread the message about the importance of choosing environmentally friendly packaging products. In addition, giving awards or certifications to companies that consistently use sustainable packaging can stimulate positive subjective norms among consumers. This, in turn, will strengthen purchasing willingness and increase demand for products with sustainable packaging, which aligns with the goals of sustainable development and environmental preservation in Yogyakarta City.

Likewise, the fourth hypothesis suggests that perceived behavioral control significantly affects the willingness to purchase eco-friendly packaged products, highlighting the importance of consumers' perceptions of their ability to carry out certain behaviors. These findings align with previous studies from Oliver et al. (2023) and Misron et al. (2023), suggesting that perceived behavioral control significantly affects willingness to purchase products with eco-friendly packaging. Based on the study's results, policymakers and program designers in Yogyakarta City can consider developing strategies to increase consumer awareness and understand how their choices affect the environment. For example, educational campaigns emphasizing the ease and benefits of using sustainably packaged products can improve perceptions of behavioral control. In addition, collaboration with business actors to provide more choices of environmentally friendly products at affordable prices and easy access can reduce barriers to sustainable consumption. This kind of strategy not only strengthens the behavioral control perceived by consumers but also practically supports the transition to a more sustainable lifestyle in urban communities such as Yogyakarta City. This suggests that a deep understanding of the dynamics of consumer behavior can play a crucial role in designing effective policies and programs to encourage sustainable consumption.

CONCLUSION

The study's findings underscore the importance of Environmental consciousness in shaping consumers' positive attitudes toward products with sustainable packaging, although such positive attitudes do not necessarily directly encourage buying. This suggests a gap between attitudes and buying behavior that can be bridged through strategies that utilize subjective norms and control perceived behavior. By focusing efforts on education and communication about the benefits of sustainable packaging and overcoming practical barriers such as accessibility and price, the government and stakeholders in Yogyakarta City can promote sustainable consumption. This strategy includes public campaigns, cooperation with local producers, and initiatives to increase the availability and affordability of environmentally friendly products. In conclusion, integrating multidimensional approaches involving education, social norms, and improved behavior control can strengthen the synergy between Environmental consciousness, policy support, and sustainable purchasing behavior, supporting environmental conservation efforts in Yogyakarta City.

This research offers valuable insights into the willingness to buy products with environmentally friendly packaging, analyzed through TPB Theory with the inclusion of Environmental consciousness variables. However, some limitations mark opportunities for further research. *First*, the focus of research on Yogyakarta City may limit the applicability of the findings widely due to the area's unique characteristics. Therefore, it is advisable to conduct comparative research between cities to evaluate the dynamics of sustainable purchasing in various socioeconomic and cultural settings. *Second*, the questionnaire survey approach used has the potential to face bias, including response bias and researcher bias. Future research could adopt in-depth interviews to collect more accurate data on respondents' behavior.

Third, the study was limited to analyzing purchase intent without measuring actual buying behavior. Given that intent does not always turn into action, bringing in actual purchase behavior variables in future studies could help bridge this gap, providing a complete understanding of how intent transforms into sustainable buying behavior. *Fourth*, this study only applied TPB as a single theory to study consumer purchase intentions in Yogyakarta City and produced a moderate R2 of 52.6%. Researchers are further advised to expand the conceptual framework by including other variables, such as moral norms, to enhance the explanatory ability of the skeleton. In addition, further research is advised to combine TPB with other theories, such as the consumption value theory, to generate new insights in this particular context.

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