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CONSUMER BEHAVIOR | RESEARCH ARTICLE

Green Marketing Strategies and Consumer Purchasing Behavior: Moderating Role of Environmental Awareness Among Supermarket Consumers in Lagos State

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Abstract:

Background: The Nigerian retail industry has grown substantially in the last ten years, especially in Lagos. There is a growing concern about environmental issues but little research on green marketing strategies and consumer purchasing behavior in Lagos supermarkets with particular reference to environmental awareness have been conducted.

Purpose: This research aims to analyze green marketing strategies (eco-labeling, green packaging, and environmental advertising) affect consumer purchases behavior among supermarket consumers in Lagos State, Nigeria, with environmental awareness as a moderating variable.

Method: The design used was a quantitative explanatory survey. The population comprise of 950 adult consumers of supermarkets (18 years and above) residing in Lagos State. A sample size of 281 was computed using the Taro Yamane formula. Purposive sampling was utilized, equally 280 valid response was actualized out of the distributed questionnaire. Hypothesis testing was analyzed through Partial Least Squares Structural Equation Modeling using Smart-PLS 4.0.

Findings: The three green marketing strategies positively impact consumer behavior, with eco-labeling the strongest. Environmental awareness influenced eco-labeling and consumer behavior and environmental advertising and consumer behavior. However, it had no effect on green packaging and consumer behavior.

Conclusion: The study concluded that eco-labeling is the most suitable green marketing strategy in supermarkets in Lagos for environmentally conscious consumers. Supermarket operators should offer environmental awareness programs along with eco-labeling to promote sustainable consumer behavior.

Research Implication: Supermarket managers should focus on investment into internationally recognized eco-certification systems and online environmental advertisement to environmentally conscious consumer groups.

Keywords: consumer purchasing behavior, eco-labeling, environmental advertising, environmental awareness, green marketing strategies, green packaging

JEL Classification: M31, D12, Q56, L81, M30

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PUBLIC INTEREST STATEMENT

Everyday shopping choices matter for the environment, and supermarkets have an important part to play in helping people shop more responsibly. Encouraging shoppers to choose greener products is not just good for the planet, it also helps build healthier, more environmentally conscious communities. This study focused on supermarkets in Lagos, Nigeria, and offers practical guidance to supermarket managers and brands on how to promote environmentally friendly products in ways that genuinely resonate with customers, rather than feeling like empty marketing. For everyday shoppers, this means it could become easier to find and choose sustainable options. In the long run, this study supports broader efforts across Nigeria to reduce the environmental impact of everyday consumption.



1. Introduction

The world of retail is at a sustainability crossroads. With climate change, loss of biodiversity, and plastic pollution being the most urgent issues that are being overstepped as planetary limits, retailers have become central figures in the shift to sustainable consumption. Green marketing has become the most important strategic tool that retailers would use to align consumer behavior with the environmental sustainability necessity, and eco-labeling, green packaging, and environmental advertising are the main tools of green marketing (Huang et al., 2024). Although the scholarly literature on green marketing has grown exponentially, there is still a great deal of unanswered empirical evidence on the effectiveness of these programs in sub-Saharan African retail markets, where institutional contexts, consumer typologies, and informational conditions vary fundamentally with the Western markets where most research on green marketing has taken place (Kuria, 2024).

The city of Lagos State, the commercial and financial capital of Nigeria, offers a very interesting research setting. Lagos boasts the biggest and most advanced formal retail market in West Africa, with an estimated population of more than 20 million and more than 150 registered supermarket chains. This retail growth has created huge environmental externalities: Lagos produces about 13,000 tons of solid waste each day, of which about 20% is packaging waste from retail supply chains. At the same time, Lagos boasts a fast-expanding group of middle-class consumers who are highly social media-driven, environmentally conscious, and increasingly exposed to the discourses of sustainability around the world. With these structural features, the need and the possibility to have effective green marketing interventions in the supermarket sector emerge (Olatunji et al., 2025).

Recently, Nigeria has passed major sustainability policy tools, including the National Environmental (Plastic Bags and Other Plastic Packaging Materials) Regulations of 2022 and the Paris Agreement commitments as part of the country's Nationally Determined Contributions that are transforming the sustainability regulatory landscape in the retail sector. These policy trends bring green marketing strategies to the crossroads of corporate strategy and regulatory compliance to give them a higher urgency of practical need to discover their consumer behavioral impact. However, even with this policy impetus, Nigerian supermarkets have been reluctant to develop and communicate green marketing strategies in a systematic manner, in part because they are unsure of whether it will work with domestic consumer groups (Olatunji et al., 2025; Babu et al., 2026).

The scholarly research in green marketing and consumer behavior has resulted in significant, yet inconsistent, results. Although many studies have established positive correlations between green marketing initiatives and purchase intentions in East Asian, South Asian, and European environments, comparative evidence on sub-Saharan Africa is significantly lacking (Ragione & Risitano, 2025; Estropia et al., 2025). Those few studies that have involved Nigerian consumers have used limited sets of variables and methods that fail to both demonstrate the differentiated effects of various types of green marketing strategies and establish conditional relationships between them and variables of consumer knowledge. This brings about a massive knowledge gap, which this study is placed to fill.

One of the key unresolved questions in the green marketing literature is whether environmental awareness enhances or only moderates the effectiveness of green marketing and whether this moderating effect is consistent across the various types of green marketing strategies. Studies have shown that environmental awareness enhanced the impact of eco-

labeling in Chinese e-commerce settings, whereas awareness mediated advertising performance between product categories (Kuria, 2024; Owen et al., 2026). Nevertheless, the hypotheses that environmental awareness has differential moderating effects on eco-labeling, green packaging, and environmental advertising, which reflect the varying cognitive processing needs of the various types of strategies, have not been investigated in the sub-Saharan African context (Nguyen et al., 2025). This is not just an academic theoretical question: the answer to it has a direct impact on the budgetary allocation of green marketing, as well as the selection of consumer segments.

The research is based on two complementary theoretical frameworks. Conceptualizing green marketing strategies as external stimuli, the Theory of Planned Behavior (Ajzen, 1991) explains how consumer sustainable purchasing decisions are shaped through its core constructs, attitude, subjective norms, and perceived behavioral control which serve as the pathways through which eco-labels, green packaging, and environmental advertising influence consumer purchasing behavior, with these effects further moderated by environmental awareness. Exposure to these strategies shapes attitudes by enhancing perceptions of product sustainability, strengthens subjective norms by signaling socially approved eco-friendly behaviors, and increases perceived behavioral control by demonstrating the feasibility of sustainable choices. Signaling Theory (Spence, 1973) explains that observable cues, such as eco-certifications and green packaging, act as credible signals that reduce information asymmetry between producers and consumers, thereby supporting the mechanisms proposed by the Theory of Planned Behavior (Atkinson & Rosenthal, 2014). By integrating these frameworks, the study provides a theoretically robust and cohesive explanation of how green marketing initiatives influence consumer behavior, with the strength of effects varying depending on the type of marketing signal and the level of consumer environmental awareness.

This study fills three major gaps in existing knowledge: there is little research on eco-labeling, green packaging, and environmental advertising on consumer behavior in supermarkets in Lagos State; little research has been conducted in Lagos on the role of environmental knowledge in the effectiveness of different green marketing strategies; and previous studies on green marketing in Nigeria have not been as rigorous as this study. The primary objective of the study is to examine green marketing strategies and consumer purchasing behavior: moderating role of environmental awareness among supermarket consumers in Lagos state, while the specific objective are to examine the effect of eco-labeling on consumer purchases behavior among supermarket consumers in Lagos State, Nigeria; assess the effect of green packaging on consumer purchases behavior among supermarket consumers in Lagos State, Nigeria; evaluate the effect of environmental advertising on consumer purchases behavior among supermarket consumers in Lagos State, Nigeria.

2. Literature Review

2.1 Theory of Planned Behavior (TPB)

Ajzen (1991) propounded the theory of planned behavior (TPB) which provides a cognitive and social mechanism through which consumers translate environmental marketing signals into sustainable purchasing behavior. In this study, TPB is operationalized through its core constructs, attitude, subjective norms, and perceived behavioral control which act as mediators between green marketing strategies and consumer purchasing behavior. Exposure

to eco-labels, green packaging, and environmental advertising shapes consumers' attitudes by enhancing perceived product sustainability, reinforces subjective norms by highlighting socially approved environmentally responsible practices, and strengthens perceived behavioral control by demonstrating the ease of adopting eco-friendly behaviors (Permasih et al., 2024). Importantly, environmental awareness is treated as a moderator, amplifying these effects: consumers with higher awareness more effectively interpret and respond to marketing cues, resulting in stronger attitudes, heightened normative influence, and greater perceived control. By integrating TPB in this way, the framework provides a cohesive explanation of how marketing stimuli translate into sustainable purchasing intentions and behavior, moving beyond mere description to a causal and empirically testable model (Rambabu et al., 2023).

2.2 Signaling Theory

Signaling Theory (Spence, 1973) provides a complementary perspective to the Theory of Planned Behavior by proposing that observable green marketing attributes, such as third-party eco-certifications, recyclable packaging, and verifiable environmental claims, function as credible signals that reduce information asymmetry between producers and consumers. These signals influence the TPB constructs: eco-labels strengthen positive attitudes by validating environmental claims, sustainable packaging enhances perceived behavioral control by demonstrating feasibility, and environmental advertising reinforces subjective norms by signaling social approval for eco-friendly consumption (Atkinson & Rosenthal, 2014; Riskos et al., 2021). Environmental awareness moderates these effects, as consumers with greater knowledge and concern for the environment are more capable of interpreting signals accurately, thereby intensifying the TPB-moderated pathways to purchasing behavior (Kolović et al., 2023). By linking signaling theory with TPB in this manner, the framework offers a theoretically rigorous, integrated explanation of how green marketing strategies drive consumer behavior in Lagos State supermarkets, suitable for international publication standards.

2.3 Green Marketing Strategies and Consumer Behavior

Green marketing strategies refers to the marketing of products assumed to be environmentally safety which include the creation and marketing of ecologically beneficial products and the application of methods that reduce environmental impact throughout the product life cycle. Since consumer awareness of environmental challenges has increased all over the world, green marketing has ceased to be a niche issue but an ordinary business approach, especially in the retail industry (Huang et al., 2024; Cynthia et al., 2023). Consumer purchasing behavior is defined as decision-making processes where people purchase goods and services to meet their needs and preferences. Within the framework of green marketing, purchasing behavior involves the active selection of products and services that have a lower environmental impact, decisions that are more and more influenced by green marketing cues (Kusumawati & Ishamiyya, 2025). Green marketing strategies are positively correlated with purchasing behavior, although dependencies on context, product type, and consumer group depend on their strength and consistency. Structural factors such as income restrictions, insufficiencies in the supply of green products, and inadequate eco-certification frameworks may mitigate the efficacy of green marketing initiatives that have been very successful in developed market environments in developing country set-ups like Nigeria (Estropia et al., 2025; Rahman et al., 2026).

2.4 Eco-labeling and Consumer Purchasing Behavior

Eco-labeling is the practice of certifying and labeling products that have environmental claims, which are represented with standardized symbols and descriptors, usually checked by third-party certification (Kumar & Basu, 2023). The main role of eco-labels in line with signaling theory is to minimize information asymmetry by allowing consumers to effectively know which products can be trusted to meet specified environmental standards. Riskos et al. (2021) established that the authenticity perceptions of eco-labels, which were mediated by label clarity and certification transparency, were the main channels by which label exposure affected purchasing behavior in emerging market situations. Awareness of eco-labels is not high in the Nigerian retail landscape, yet it is increasing quickly among urban and educated consumer groups (Faza et al., 2024; Zhan et al., 2025). The effectiveness of the eco-labels in Nigeria will depend on the effectiveness of enforcement mechanisms and consumer familiarity with the certifying organizations, variables that distinguish the setting in Nigeria and that of the developed market environments where the system of eco-labels is more advanced.

H1: Eco-labeling significantly and positively impacts consumer purchasing behavior among supermarket consumers in Lagos State.

2.5 Green Packaging and Purchasing Behavior by Consumers

Green packaging involves design, material choice, and communication of more environmentally friendly packaging, such as biodegradable, recyclable, or minimized packaging (Mahmoud et al., 2022). The green packaging issue in Nigeria is acute: the country produces more than 2.5 million tons of plastic waste each year, and Lagos disproportionately due to the population density and the retail activity. Hasan et al. (2024) showed that the influence of green packaging on consumer purchasing behavior in Bangladesh was significant and that the relationship between the two was partly mediated by environmental concern. Their results are specifically applicable to the Lagos State scenario under the conditions of similar rates of economic development and problems of environmental waste. George et al. (2023) demonstrated that the three most effective packaging factors on the purchase intentions of young consumers in India were packaging recyclability, biodegradability, and minimized excess.

H2: Green packaging significantly and positively influences consumer purchasing behavior among supermarket consumers in Lagos State.

2.6 Environmental Advertising and Consumer Purchasing Behavior

Environmental advertising refers to marketing communications that highlight the ecological benefits of products and encourage environmentally responsible consumer choices (Mahmoud et al., 2022). Such advertising may encompass television and radio campaigns, social media content, in-store point-of-sale materials, and product literature. Riskos et al. (2021) identified credibility of environmental claims, message involvement, and consumer environmental concern as key determinants of environmental advertising effectiveness. Where advertising claims are perceived as greenwashing, overstating environmental benefits without substantive action, consumer skepticism can undermine purchasing behavior, making authenticity and transparency critical design principles for environmental advertising campaigns. In Lagos State, where mobile internet penetration exceeds 70% and social media

consumption is extensive particularly among the 18-35 demographic that dominates supermarket shopping, digital environmental advertising represents a particularly potent channel.

H3: Environmental advertising significantly and positively influences consumer purchasing behavior among supermarket consumers in Lagos State.

2.7 Environment Awareness as a Moderator

Environmental awareness reflects consumers' knowledge of and concern for environmental issues, shaping how they perceive and respond to marketing initiatives (George et al., 2023). While several studies confirm that higher awareness amplifies the effect of green marketing, the nature and strength of this moderation appear to vary across contexts and types of stimuli. For instance, Zhan et al. (2025) found that environmentally aware consumers responded more strongly to knowledge-demanding cues such as eco-labels than to simpler signals like packaging aesthetics, suggesting that moderation is contingent on cognitive engagement. Similarly, Huang et al. (2024) observed that high-awareness consumers were significantly more responsive to environmental advertising across different product categories, highlighting that moderation effects are influenced by both message complexity and consumer processing capacity. In Lagos State, urban and educated consumers disproportionately represent the supermarket population and tend to exhibit higher environmental awareness (Owen et al., 2026), implying that awareness could act as a key boundary condition for the effectiveness of green marketing strategies. Despite this, empirical studies rarely quantify or compare the moderating effect across different green marketing tools, revealing a theoretical gap that underscores the need for systematic investigation in the Nigerian context.

2.8 Environmental Awareness and Eco-labeling

Eco-labeling is a central green marketing strategy, providing consumers with information about the environmental attributes of products and guiding more sustainable purchase choices (Ragione & Risitano, 2025). While previous studies consistently show that eco-labels enhance purchase intentions among environmentally aware consumers, the strength of this effect varies depending on the context and product type. Hasan et al. (2024) found a substantial impact of eco-labeling on green consumers' purchase behavior in Nigeria, yet some research indicates that eco-labels may be less effective when consumers are unfamiliar with certification standards or distrust the credibility of the label. Environmental awareness moderates the influence of eco-labels, such that highly aware consumers are more likely to process and trust eco-label information, leading to stronger attitudinal and behavioral responses. Despite general agreement on the positive role of eco-labels, there is a theoretical gap in understanding the relative moderation effect of environmental awareness across product categories and varying types of eco-labels in the Lagos State supermarket context, which this study aims to address.

H4: Environmental awareness significantly moderates the positive relationship between eco-labeling and consumer purchasing behavior.

2.9 Environmental Awareness and Green Packaging

Green packaging, encompassing biodegradable, recyclable, and reusable materials, has emerged as a critical focus for environmentally conscious consumers in Nigeria, driven by both rising environmental awareness and challenges in waste management (Mahliza et al., 2025). Previous studies indicate that green packaging positively influences consumer purchase intentions, particularly among individuals with high environmental awareness. However, the impact of green packaging is conditional: while environmentally aware consumers are more likely to recognize and value its sustainability benefits, others may prioritize product functionality, convenience, or aesthetics over environmental considerations, revealing nuanced and sometimes conflicting findings (Kuria, 2024; Owen et al., 2026). In this context, environmental awareness serves as a moderator, amplifying the effects of green packaging on consumers' attitudes and purchase intentions by enhancing their ability to interpret and trust the environmental attributes of products. Despite recognition of this moderating role, a theoretical gap remains in understanding how environmental awareness differentially influences responses to green packaging compared with other green marketing strategies, such as eco-labeling and environmental advertising, particularly within Lagos State supermarkets. Addressing this gap is essential for designing targeted green marketing strategies that align with consumers' varying levels of environmental consciousness.

H5: Environmental awareness significantly moderates the relationship between green packaging and consumer purchasing behavior.

2.10 Environmental Awareness and Environmental Advertising

Environmental advertising, which communicates the ecological benefits of products or services, is a key component of green marketing strategies aimed at shaping consumer behavior (Nguyen et al., 2025). While prior studies indicate that environmentally aware consumers are generally more responsive to such advertising, the evidence is nuanced. Highly aware consumers engage more deeply with advertising content, processing both cognitive information and emotional appeals, whereas consumers with lower awareness may overlook or undervalue these messages (Zhan et al., 2025). Environmental awareness functions as a moderator in this context, strengthening the influence of environmental advertising on consumer attitudes, perceived social norms, and perceived behavioral control, and thereby enhancing sustainable purchasing behavior. However, the magnitude of this moderation varies depending on the complexity and credibility of the advertising message, highlighting a context-specific boundary condition. Despite general consensus on the positive moderating role of environmental awareness, there remains a theoretical gap in understanding how its effect differs across advertising formats and in comparison, to other green marketing strategies, such as eco-labeling and green packaging, particularly within the Lagos State supermarket context. Addressing this gap is critical for developing marketing strategies that are tailored to consumers with varying levels of environmental awareness.

H6: Environmental awareness significantly moderates the relationship between environmental advertising and consumer purchasing behavior.

3. Conceptual Framework

The conceptual framework of this study examines how green marketing practices (eco-labeling, green packaging, and environmental advertising) affect consumer purchasing behavior among supermarket consumers in Lagos State. It was expanded to incorporate environmental awareness as a moderating variable, capturing how the influence of each marketing practice varies with consumers' level of awareness, providing a more comprehensive understanding of the relationships between these variables. The study's conceptual model is presented in Figure 1.

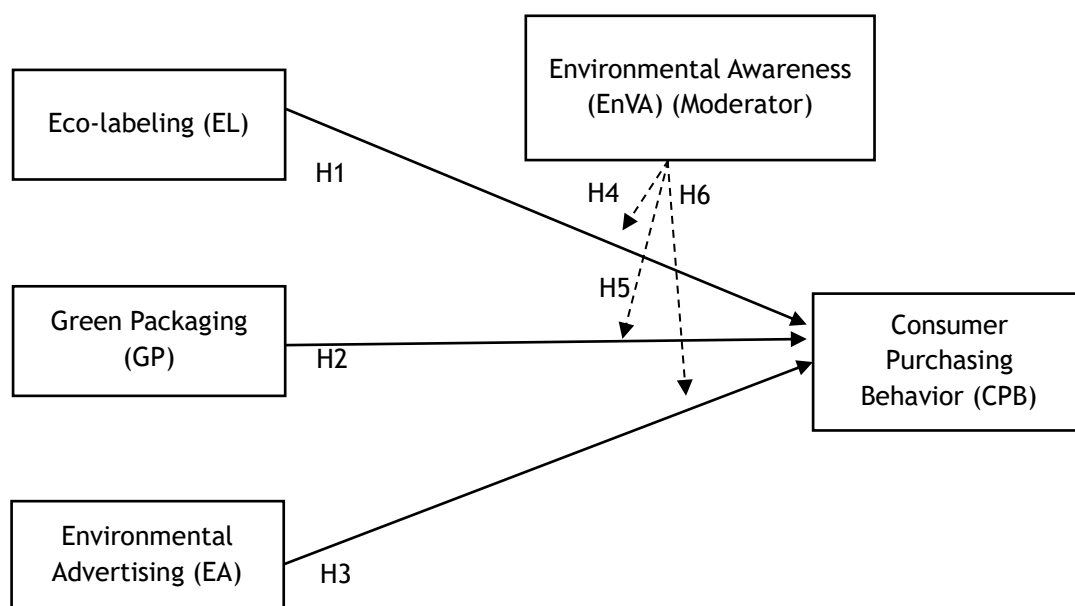


Figure 1. Conceptual Framework of green marketing strategies and consumer purchase behavior with environmental awareness as moderating variable for supermarket consumers in Lagos state.

The hypotheses of this study are as follows:

- H1: Eco-labeling significantly and positive impact consumer purchasing behavior among the supermarket consumers in Lagos State.
- H2: Green packaging significantly and positively influences consumer purchasing behavior among supermarket consumers in Lagos State.
- H3: Environmental advertising significantly and positively influences consumer purchasing behavior among supermarket consumers in Lagos State.
- H4: Environmental awareness significantly moderates the positive relationship between eco-labeling and consumer purchasing behavior, such that the effect is stronger among consumers with higher environmental awareness.
- H5: Environmental awareness significantly moderates the relationship between green packaging and consumer purchasing behavior, such that the positive effect of green packaging is stronger among consumers with higher environmental awareness.
- H6: Environmental awareness significantly moderates the relationship between environmental advertising and consumer purchasing behavior, such that the effect is stronger among consumers with higher environmental awareness.

4. Methods

4.1 Research Design

This research was quantitative explanatory research. An explanatory design suits the situation when the study aim is to determine causal relationships between variables and test theoretically-based hypotheses about the relationships between variables. This research design is a cross-sectional survey where the data were collected at one point in time using a representative sample of supermarket consumers in Lagos State. Although cross-sectional designs do not allow longitudinal causal inference, they are suitable in studies that require testing structural models of consumer behavior with theoretically clearly established causal logic and whose main goal is to estimate parameters and not to follow them over time.

4.2 Sampling

The study population consisted of 950 adult consumers who had made at least one purchase in the selected supermarkets within the six months prior to data collection. This number represents the sampling frame of customers from the targeted stores in five key Local Government Areas (LGAs), Ikeja, Victoria Island, Surulere, Lekki, and Alimosho, chosen to reflect geographical and socio-economic diversity within Lagos State, rather than the entire metropolitan population. A sample size of 281 respondents was computed using the Taro Yamane formula. Purposive sampling was employed to ensure that participants had sufficient experience with supermarket purchases to provide informed responses regarding green marketing strategies. In each LGA, two or three supermarket stores were selected, and questionnaires were distributed proportionally, resulting in 280 valid responses. It should be noted that, because purposive sampling is a non-probability technique, the findings cannot be statistically generalized to the broader Lagos State population, but they provide meaningful insights into consumers with experience in the selected supermarkets and contexts relevant to green marketing evaluation. The sample size also meets the minimum structural path requirements for PLS-SEM analysis, ensuring sufficient statistical power for the proposed model.

4.3 Measurement

The operationalization of all constructs was based on multi-item reflective scales previously validated in the literature and adapted to the supermarket context of Lagos State. Responses were collected on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Scales were selected as follows: eco-labeling (5 items; Chan et al., 2022; Atkinson & Rosenthal, 2014), green packaging (5 items; Hemachandra et al., 2024), environmental advertising (5 items; Nyilasy et al., 2014), consumer purchasing behavior (5 items; Duarte et al., 2024), and environmental awareness (5 items; Mahmoud et al., 2022). A pilot test with 35 respondents ensured comprehensibility and cultural appropriateness of the items. Construct reliability was assessed using Cronbach's alpha and composite reliability (CR), with thresholds >0.70. Convergent validity required average variance extracted (AVE) >0.50 and factor loadings >0.70. The full list of questionnaire items and indicators is presented in Appendix, ensuring transparency and addressing discrepancies between stated items and reported indicators. The operational definitions and details of indicators are given in Table 1.

Table 1. Operational variables and indicators of green marketing strategies and consumer purchasing behavior

Variables	Source	Operational Definition	Indicators
Eco-labeling (EL)	Chan et al. (2022); Atkinson & Rosenthal (2014)	Use of environmental certification labels on products to signal sustainability credentials and guide consumer choice.	1) Trust in eco-label certification 2) Clarity of label information 3) Influence on purchase decisions
Green Packaging (GP)	Hemachandra et al. (2024)	Design and use of packaging materials that minimize environmental impact through biodegradability, recyclability, or reduced material consumption.	1) Use of biodegradable materials 2) Recyclability of packaging 3) Reduced excess packaging
Environmental Advertising (EA)	Nyilasy et al. (2014)	Marketing communications emphasizing ecological product benefits and sustainability claims aimed at influencing consumers' environmental attitudes and purchase decisions.	1) Believability of environmental claims 2) Frequency of green advertisement exposure 3) Motivation to act on green ads
Consumer Purchasing Behavior (CPB)	Duarte et al. (2024)	The intentional act of selecting products with reduced environmental impact over conventional alternatives, reflecting sustainable consumption decisions.	1) Priority for eco-friendly products 2) Frequency of green purchases 3) Willingness to pay a green premium
Environmental Awareness (EnvA) [Moderator]	Mahmoud et al. (2022).	The extent to which consumers possess knowledge of, and express concern about, environmental problems and the role of human consumption in contributing to them	1) Knowledge of environmental issues 2) Concern for ecological degradation 3) Awareness of sustainable practices

Note. EL = eco-labeling; GP = green packaging; EA = environmental advertising; CPB = consumer purchasing behavior; EnvA = environmental awareness.

4.4 Data Collection

Data were gathered through physical questionnaire administration in supermarket locations. Physical questionnaires were distributed to consumers after actual purchases by trained research assistants at the exits of the supermarkets during peak shopping time (evenings on weekdays and mornings on weekends). The data collection was done in a six-week period,

from February 1, 2026 to March 14, 2026. Physical questionnaires included a preamble of informed consent in which the respondents gave their consent. No personal identifying information was collected.

4.5 Data Analysis

The two-stage PLS-SEM approach was used to analyze the data. In the outer (measurement) model, convergent validity was assessed using factor loadings (>0.70), average variance extracted (AVE >0.50), and composite reliability (>0.70), while discriminant validity was evaluated using both the Fornell-Larcker criterion (square root of AVE larger than inter-construct correlations) and the HTMT ratio (<0.85). Variance inflation factors (VIF) were examined to detect multicollinearity, and all values were below the recommended threshold of 5.0. In the inner (structural) model, direct effects of eco-labeling, green packaging, and environmental advertising on consumer purchasing behavior, as well as the moderating effects of environmental awareness, were estimated using the product-indicator approach in SmartPLS 4.0. Bootstrapping with 5,000 resamples was performed to obtain stable parameter estimates, confidence intervals, and significance tests (two-tailed, $t > 1.96$, $p < 0.05$). Model fit was assessed using SRMR and NFI indices to ensure adequate global fit. Additionally, a common method bias assessment was conducted using full collinearity VIF and Harman's single-factor test, confirming that bias did not substantially affect the results. This rigorous analysis ensures the reliability, validity, and robustness of the PLS-SEM results.

5. Findings

5.1 Respondent Characteristics

The demographic of the 280 valid respondents is presented in Table 2. The demographic profile was also predominantly of young adult (75.0% aged 18-35) age, which aligns with previous descriptions of active consumers of the supermarket in urban Nigerian markets. The ratio of female to male respondents was slightly higher (54.3% and 45.7%). The level of education was quite good, with 71.8% having at least a bachelor's degree, which is similar to the supermarket consumer in Lagos State and facilitates significant self-reporting of the green marketing characteristics. The earnings distribution was indicative of the Lagos State lower-middle-income majority, with 34.6% of people making between ₦50,000 and ₦150,000 a month.

Table 2. Demographic characteristics of respondents (n=280)

Demographic Variable	Category	Frequency	Percentage (%)
Age	18-25	112	40.0
	26-35	98	35.0
	36-45	49	17.5
	46-55	17	6.1
	Over 55	4	1.4
Gender	Male	128	45.7
	Female	152	54.3
Marital Status	Married	103	36.8
	Single	177	63.2

Table 2. Demographic characteristics of respondents (n=280) (Continue)

Demographic Variable	Category	Frequency	Percentage (%)
Level of Education	Secondary School Certificate	41	14.6
	OND/NCE	38	13.6
	HND/Bachelor's Degree	158	56.4
	Postgraduate Degree	43	15.4
	Secondary School Certificate	41	14.6
Monthly Income (NGN)	Below ₦50,000	52	18.6
	₦50,000- ₦150,000	97	34.6
	₦150,000- ₦300,000	84	30.0
	Above ₦300,000	47	16.8

5.2 PLS Model Scheme for Green Marketing Variables, Consumer Purchasing Behavior, and Environmental Awareness

The PLS-SEM model was conceptualized to examine the impact of eco-labeling, green packaging, and environmental advertising (exogenous latent variables) on consumer purchasing behavior (endogenous latent variable). Green awareness was also included as a moderating variable with interactions with all the exogenous variables. Reflective indicators were used in the model, as they are defined as the reflection of latent variables. The loadings were all above the recommended threshold of 0.70, hence showing adequate reliability (Hair et al., 2019).

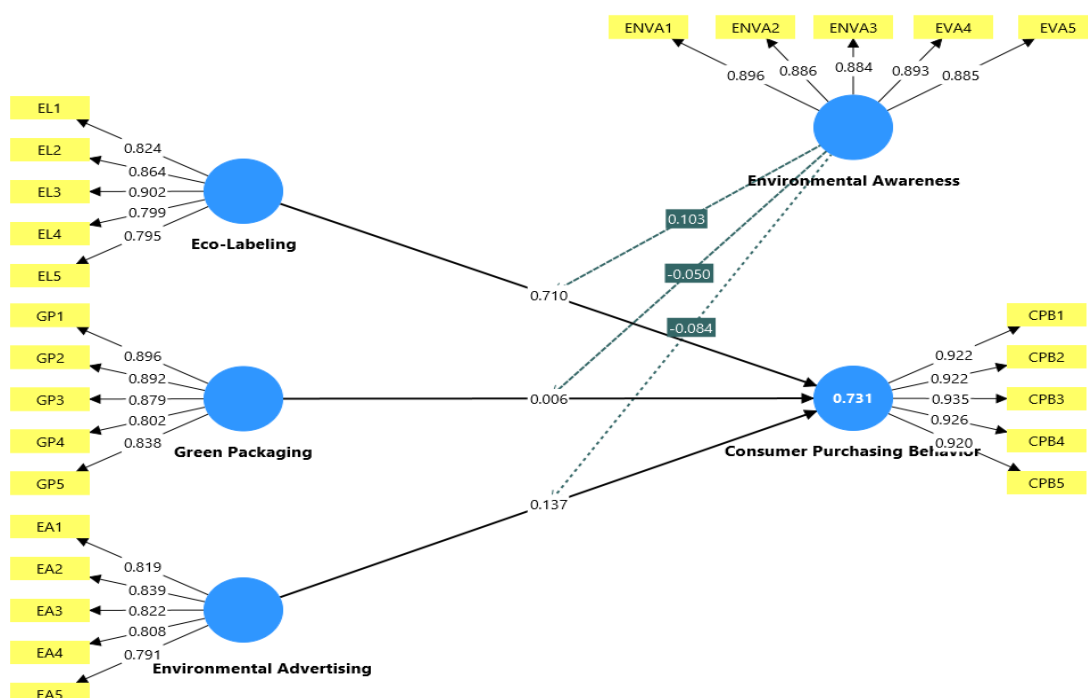


Figure 2. T-Statistics for the Hypothesis

The T-statistics (Figure 2) present the strength of the relationships and the importance of the paths. The path coefficients show the influence of each of the green marketing strategies on consumer purchasing, and the moderating influence of environmental awareness shows how environmental awareness increases or decreases the influence of green marketing

strategies on consumer purchasing behavior. This shows that green labeling, green packaging, and environmental advertising are significant factors that impact consumer purchasing behavior, and environmental awareness is a significant moderating factor in the impact of green marketing strategies. The scheme of the structural model, with standardized path coefficients and indicator loadings, is in Figure 2.

5.3 Convergent Validity

The convergent statistics and reliability are in Table 3. All the indicator loadings were between 0.798 and 0.908, all t-statistics were greater than 1.96, and all p-values were less than 0.05, which confirmed the statistical significance of all item-construct relationships. The AVE scores (environmental advertising) were 0.671 to 0.784 (consumer purchasing behavior), which were above the mark of 0.50. CR values were between 0.860 and 0.916, Cronbach alpha values were between 0.753 and 0.868, and all values were above the 0.70 reliability level. The outcomes validate an acceptable level of convergent and internal consistency reliability among all constructs.

Table 3. Validity and reliability of the measurement model

Variable	Loading Factors	Std. Error	T-statistic	p-Value	AVE	CR	Cronbach's Alpha
El	0.851	0.027	31.522	0.000	0.719	0.884	0.812
	0.876	0.021	41.714	0.0004			
	0.837	0.033	25.364	0.000			
GP	0.823	0.036	22.861	0.000	0.693	0.870	0.776
	0.865	0.025	34.600	0.000			
	0.815	0.041	19.878	0.000			
EA	0.798	0.044	18.136	0.000	0.671	0.860	0.753
	0.844	0.029	29.103	0.000			
	0.821	0.037	22.189	0.000			
CPB	0.891	0.019	46.895	0.000	0.784	0.916	0.868
	0.908	0.015	60.533	0.000			
	0.869	0.022	39.500	0.000			
EnvA	0.862	0.356	2.421	0.016	0.748	0.899	0.832
	0.901	0.371	2.428	0.015			
	0.852	0.318	2.679	0.007			
Moderating Effect	1.087	0.068	15.985	0.000	—	—	—

Note. EL = eco-labeling; GP = green packaging; EA = environmental advertising; CPB = consumer purchasing behavior; EnvA = environmental awareness; AVE = average variance extracted; CR = composite reliability.

5.4 Discriminant Validity

The Fornell-Larcker discriminant validity is given in Table 4. The diagonal elements are the square root of each construct's AVE (asterisked). The diagonal AVE square root values are larger than the respective off-diagonal inter-construct correlation coefficients across all rows and columns, which confirms that all constructs have discriminant validity.

It was found that the environmental advertising and the green packaging had the highest inter-construct correlation ($r = 0.514$), which is considerably lower than the AVE square roots of the two constructs (0.819 and 0.832, respectively), which validates that the constructs are empirically different. To provide a fuller assessment of discriminant validity, the Heterotrait-Monotrait Ratio (HTMT) values are presented in the upper triangle of the same table, alongside the Fornell-Larcker criterion in the lower triangle and diagonal.

Table 4. Discriminant validity of variables (fornell-larcker criterion, lower triangle; HTMT, upper triangle)

Construct	EL	GP	EA	CPB	EnvA
EL	0.848*	0.532	0.498	0.561	0.158
GP	0.492	0.832*	0.544	0.507	0.134
EA	0.458	0.514	0.819*	0.533	0.177
CPB	0.531	0.467	0.503	0.885*	0.122
EnvA	0.118	0.094	0.137	0.082	0.865*

Note. EL = eco-labeling; GP = green packaging; EA = environmental advertising; CPB = consumer purchasing behavior; EnvA = environmental awareness. Diagonal entries (bolded, asterisked) are square roots of AVE (Fornell-Larcker criterion). Values below the diagonal are inter-construct correlations; values above the diagonal are HTMT ratios. All HTMT values are below the recommended threshold of 0.85.

The results in Table 4 confirm discriminant validity through both criteria: every diagonal AVE square root exceeds its corresponding row/column correlations (Fornell-Larcker), and every HTMT ratio, ranging from 0.122 (CPB-EnvA) to 0.561 (EL-CPB), remains below the 0.85 threshold. The highest HTMT value (0.561) was recorded between eco-labeling and consumer purchasing behavior, still comfortably below the threshold, while the lowest (0.122) was observed between consumer purchasing behavior and environmental awareness. The convergence of both criteria confirms that discriminant validity problems were absent from the measurement model.

5.5 Inner Model Evaluation

The inner model evaluation statistics are presented in Table 5. The total variance in consumer purchasing behavior ($R^2 = 0.318$) explained by the three green marketing strategies was moderate, as is typical of models of this nature in consumer behavior research, and thus the three strategies have moderate predictive power. The effect size analysis (f^2) showed that eco-labeling was the largest influence on consumer purchasing behavior ($f^2 = 0.218$, medium-to-large); next was environmental advertising ($f^2 = 0.113$, small-to-medium), and finally green packaging ($f^2 = 0.094$, small).

The Q^2 value of the model of 0.187 is what proved that the model was predictively relevant above zero on consumer purchasing behavior, which means that the model is better than the naïve mean model. Table 5 also reports the variance inflation factors (VIF) for each construct and the overall model fit assessment, in place of separate tables.

As shown in Table 5, all VIF values ranged from 1.312 to 1.533, well below the recommended threshold of 5.0 and the more conservative 3.3 threshold used to detect common method bias, indicating negligible multicollinearity among the constructs. The model fit indices further confirm adequate fit: the SRMR values for the saturated (0.064) and estimated (0.069) models were both below the 0.08 threshold, and the NFI values (0.914 and 0.906, respectively) exceeded the minimum 0.90 threshold. The d_{ULS} and d_G values were within acceptable limits, indicating minimal discrepancies between the empirical and model-

implied correlation matrices, and the RMS Theta value of 0.097 was below the recommended threshold of 0.12. Overall, the combined R^2 , f^2 , Q^2 , VIF, and fit statistics confirm that the proposed structural model adequately represented the observed data without collinearity or specification concerns.

Table 5. Structural model assessment: R^2 , f^2 , Q^2 , VIF, and model fit indices

Variable	R^2	f^2	Q^2	VIF
Consumer Purchasing Behavior	0.318	-	0.187	1.523
Eco-labeling (EL)	-	0.218	-	1.430
Green Packaging (GP)	-	0.094	-	1.533
Environmental Advertising (EA)	-	0.113	-	1.470
Environmental Awareness (EnvA)	-	-	-	1.312
Panel B: Model Fit Assessment				
Model Fit Measure	Saturated Model	Estimated Model		
SRMR	0.064	0.069		
NFI	0.914	0.906		
d_ULS	1.623	1.741		
d_G	0.744	0.782		
Chi-Square	1687.34	1712.88		
RMS Theta	0.097	—		

Note. - = not applicable. EL = eco-labeling; GP = green packaging; EA = environmental advertising; CPB = consumer purchasing behavior; EnvA = environmental awareness. R^2 = coefficient of determination; f^2 = Cohen's effect size; Q^2 = predictive relevance; VIF = variance inflation factor. SRMR = Standardised Root Mean Square Residual; NFI = Normed Fit Index; d_ULS = Squared Euclidean Distance; d_G = Geodesic Distance; RMS Theta = Root Mean Square Residual Covariance of the Outer Model. All VIF values were well below the recommended threshold of 5.0 (and the more conservative 3.3 threshold for common method bias).

5.6 Hypotheses Testing

Table 6 present the hypothesis testing results indicate that eco-labeling ($\beta = 0.312$, $t = 5.379$, $p < 0.001$), green packaging ($\beta = 0.198$, $t = 3.246$, $p = 0.001$), and environmental advertising ($\beta = 0.231$, $t = 4.200$, $p < 0.001$) all have significant positive effects on consumer purchasing behavior, supporting H1-H3. Regarding moderation, environmental awareness significantly strengthened the relationship between eco-labeling and CPB ($\beta = 0.143$, $t = 2.234$, $p = 0.026$) and between environmental advertising and CPB ($\beta = 0.119$, $t = 1.983$, $p = 0.047$), supporting H4 and H6, while it did not significantly moderate the effect of green packaging on CPB ($\beta = 0.087$, $t = 1.225$, $p = 0.221$), resulting in the rejection of H5. These findings suggest that the impact of green marketing strategies is contingent on consumers' environmental awareness, particularly for knowledge-intensive signals like eco-labels and advertising, whereas simpler cues such as packaging are less influenced by awareness.

Table 6. Hypotheses testing results of SEM-PLS, significance, and decision

Hypothesis	Path Coefficient (β)	Std. Dev.	T-statistic	P-value	95% CI	f^2	Decision
H1: EL $\rightarrow$ CPB	0.312	0.058	5.379	0.000*	0.197 - 0.430	0.12	Accepted
H2: GP $\rightarrow$ CPB	0.198	0.061	3.246	0.001*	0.080 - 0.316	0.05	Accepted

Table 6. Hypotheses testing results of SEM-PLS, significance, and decision (Continue)

Hypothesis	Path Coefficient (β)	Std. Dev.	T-statistic	P-value	95% CI	f ²	Decision
H3: EA → CPB	0.231	0.055	4.200	0.000*	0.123 - 0.343	0.07	Accepted
H4: EnvA × EL → CPB	0.143	0.064	2.234	0.026*	0.018 - 0.268	0.02	Accepted
H5: EnvA × GP → CPB	0.087	0.071	1.225	0.221	-0.051 - 0.225	0.01	Rejected
H6: EnvA × EA → CPB	0.119	0.060	1.983	0.047*	0.002 - 0.236	0.015	Accepted

Note. EL = eco-labeling; GP = green packaging; EA = environmental advertising; CPB = consumer purchasing behavior; EnvA = environmental awareness; (*) significant at $p < 0.05$. Highlighted row (H5) indicates the only non-significant result.

Figure 3 shows that the combined moderation plot illustrates how environmental awareness (EnvA) influences the effect of three green marketing strategies on consumer purchasing behavior (CPB). Eco-labeling and environmental advertising show steeper slopes for consumers with high environmental awareness, indicating that these strategies are more effective when consumers are knowledgeable and concerned about environmental issues. In contrast, green packaging exhibits a flatter slope, suggesting that the influence of packaging on purchasing behavior is less affected by environmental awareness. This visualization confirms the PLS-SEM results: environmental awareness significantly moderates the effect of eco-labeling and environmental advertising on CPB (H4 and H6 supported), while its moderating effect on green packaging is non-significant (H5 rejected). The plot provides a clear, visual representation of how high-awareness consumers respond more strongly to knowledge-intensive marketing signals, highlighting the conditional nature of green marketing effectiveness.

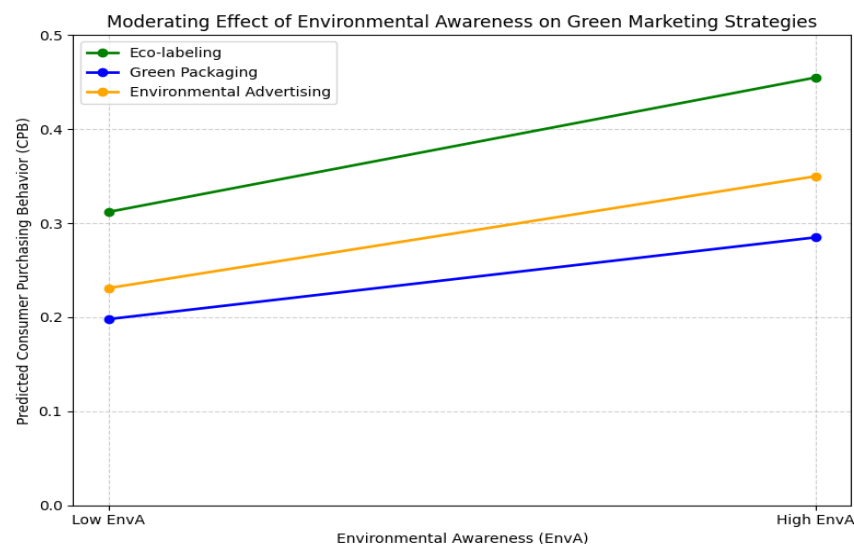


Figure 3. Moderation interaction plot

6. Discussion

6.1 Effect of Eco-labeling on Consumer Purchasing Behavior

The results indicate that eco-labeling has a significant positive effect on consumer purchasing behavior in Lagos State supermarkets, supporting Hypothesis 1 (H1). This finding suggests that eco-labels play an important role in influencing consumers' decisions by providing credible information about the environmental attributes of products and reducing uncertainty associated with green claims. In a market where consumers may find it difficult to verify the authenticity of environmental practices, eco-labels serve as a trust mechanism that enhances confidence and encourages sustainable purchasing decisions. The result is consistent with Zhan et al. (2025) and Kolović et al. (2023), who found that the credibility and authenticity of eco-labels significantly influence consumer behavior, particularly in emerging markets. Similarly, Riskos et al. (2021) emphasized that label credibility and consumer trust are key factors connecting eco-labeling with purchase behavior. Therefore, while eco-labeling appears to be an effective green marketing strategy, its impact depends on factors such as consumer awareness, trust in certification systems, and effective communication of sustainability information.

6.2 Effect of Green Packaging on Consumer Purchasing Behavior

The results indicate that green packaging has a significant positive effect on consumer purchasing behavior in Lagos State supermarkets, thereby supporting Hypothesis 2 (H2). This finding suggests that sustainable packaging attributes influence consumers' purchase decisions by serving as visible indicators of environmental responsibility. The visibility of packaging waste, including plastic pollution, littered streets, and blocked drainage systems, makes sustainable packaging a noticeable cue that attracts consumer attention (Nguyen et al., 2025). However, although green packaging contributes positively to consumer purchase decisions, its effect size is smaller than that of eco-labeling and environmental advertising, suggesting that it primarily functions as a baseline indicator of environmental responsibility rather than a strong product differentiator. This implies that while consumers recognize and respond to sustainable packaging, packaging alone may provide limited sustainability information compared with more detailed green marketing tools such as eco-labels and environmental advertising (Zhan et al., 2025; Kolović et al., 2023). Supporting this view, Rana et al. (2026) found that visual packaging cues alone do not strongly leverage consumer knowledge unless combined with additional informative signals or educational initiatives. The finding is consistent with Duarte et al. (2024), who found that sustainable packaging attributes such as recyclability and biodegradability positively shape purchase intentions, further supporting the acceptance of H2.

6.3 Effect of Environmental Advertising on Consumer Purchasing Behavior

A significant positive relationship was found between environmental advertising and consumer purchasing behavior in Lagos State supermarkets, providing support for Hypothesis 3 (H3). This finding suggests that sustainability-focused advertisements influence consumers by increasing awareness, communicating environmental benefits, and shaping positive attitudes toward environmentally responsible products. The result aligns with Nyilasy et al. (2014) and George et al. (2023), who reported that digital green advertising significantly influences sustainable purchase intentions. In Lagos State, factors such as high social media penetration, increased attention to environmental issues, and a young, engaged consumer

population create favorable conditions for sustainability-focused advertisements to effectively influence purchasing decisions. Furthermore, the acceptance of Hypothesis Six (H6) indicates that environmental awareness strengthens the relationship between environmental advertising and consumer purchasing behavior, suggesting that consumers with higher environmental knowledge are more receptive to sustainability messages. This finding is consistent with Owen et al. (2026), who found that environmentally informed consumers demonstrate greater responsiveness to green marketing campaigns. Additionally, Cynthia et al. (2023) noted that green marketing communication strengthens pro-environmental purchasing behavior, further reinforcing the acceptance of H3. Therefore, environmental advertising is more effective when combined with informative sustainability messages and consumer education initiatives that enhance environmental understanding.

6.4 Moderating Effect of Environmental Awareness on Eco-labeling

The results indicate that environmental awareness significantly moderates the relationship between eco-labeling and consumer purchasing behavior, thereby supporting Hypothesis 4 (H4). This finding suggests that consumers with higher levels of environmental knowledge are more likely to recognize the value of eco-labels and respond positively to products carrying environmental certifications. Environmental awareness therefore enhances consumers' ability to interpret sustainability information, making eco-labels more effective in influencing purchasing decisions. The finding aligns with Mahmoud et al. (2022), who demonstrated that environmentally conscious consumers exhibit stronger responsiveness to eco-labels. Similarly, Ragione and Risitano (2025) emphasized that higher environmental consciousness leads to more positive behavioral responses toward eco-certifications. These results indicate that improving consumer environmental awareness can strengthen the effectiveness of eco-labeling as a green marketing strategy. Therefore, supermarkets should not only adopt credible eco-certifications but also implement educational initiatives that improve environmental literacy and enable consumers to make more informed sustainable purchasing decisions. This finding is further supported by Kumar and Basu (2023), who found that eco-labels are more likely to stimulate green purchase intentions among emerging market consumers with greater environmental knowledge, reinforcing the acceptance of H4.

6.5 Moderating Effect of Environmental Awareness on Green Packaging

The findings indicate that environmental awareness does not significantly moderate the relationship between green packaging and consumer purchasing behavior. Therefore, Hypothesis 5 (H5) is not supported. This finding suggests that although green packaging has a positive direct influence on purchasing decisions, the strength of this relationship does not significantly differ between consumers with higher and lower levels of environmental awareness. Green packaging appears to function as a simple and observable environmental cue that consumers can easily recognize without requiring extensive environmental knowledge. This finding contrasts with Rana et al. (2026) and Li (2025), who observed stronger responses to sustainable packaging among environmentally aware consumers. The result implies that packaging cues alone may provide limited sustainability information, and their influence may become stronger when combined with other informative green marketing strategies such as eco-labels, environmental advertising, and consumer education initiatives. This aligns with Hemachandra et al. (2024), who found that packaging-related sustainability cues are processed similarly across consumer segments regardless of environmental knowledge, thereby supporting the rejection of H5.

6.6 Moderating Effect of Environmental Awareness on Environmental Advertising

The findings indicate that environmental awareness significantly moderates the relationship between environmental advertising and consumer purchasing behavior, suggesting that the effectiveness of environmental advertising varies according to consumers' level of environmental awareness. Accordingly, Hypothesis 6 (H6) is supported. This finding suggests that consumers with higher levels of environmental awareness are more likely to respond positively to advertisements emphasizing product sustainability because they possess greater knowledge and concern about environmental issues. Consequently, environmental awareness strengthens the effectiveness of green advertising messages by enabling consumers to better understand and evaluate sustainability claims. The finding is consistent with Panopoulos et al. (2022), who reported that environmentally conscious consumers are more influenced by environmental advertising, and Tanaka et al. (2024), who emphasized that advertisements targeted toward informed consumers generate higher engagement and purchase intentions. These results indicate that environmental advertising produces stronger outcomes when combined with efforts to improve consumer environmental knowledge. By aligning advertising content with the environmental concerns and awareness levels of consumers, supermarkets can enhance the effectiveness of sustainability messages and encourage more environmentally responsible purchasing behavior. This finding is further supported by Huang et al. (2024), who found that consumers with high environmental awareness were significantly more responsive to environmental advertising across product categories, reinforcing the acceptance of H6.

6.7 Managerial Implications

The findings provide important implications for supermarket managers and sustainability practitioners in Lagos State. Supermarkets should prioritize eco-labeling as the core green marketing strategy because it exerted the strongest positive influence on consumer purchasing behavior. Investment in internationally recognized eco-certifications, supported by clear in-store communication, can strengthen consumer trust and sustainable purchasing. Furthermore, supermarkets should enhance consumers' environmental awareness through sustainability education, QR-code-enabled product information, and targeted awareness campaigns, as environmental awareness significantly strengthened the effects of eco-labeling and environmental advertising. Environmental advertising should therefore emphasize credible, transparent, and locally relevant sustainability messages, particularly across digital platforms, to maximize its effectiveness. Although green packaging positively influenced consumer purchasing behavior, its effect was not strengthened by environmental awareness; therefore, it should complement, rather than replace, eco-labeling and environmental advertising within an integrated green marketing strategy.

6.8 Theoretical Implications

This study contributes to green marketing literature by providing empirical support for the Theory of Planned Behavior (TPB) and partial support for Signaling Theory in the Nigerian retail context. Consistent with TPB, the significant effects of eco-labeling, green packaging, and environmental advertising on consumer purchasing behavior indicate that green marketing strategies function as external stimuli that foster favourable evaluations of environmentally responsible products and translate into sustainable purchasing behavior. The findings also provide partial support for Signaling Theory by demonstrating that environmental awareness significantly strengthened the effects of eco-labeling and

environmental advertising, suggesting that consumers respond more positively to credible and information-rich sustainability signals when they possess greater environmental knowledge. However, the non-significant moderating effect of environmental awareness on green packaging indicates that simple visual cues may influence purchasing behavior regardless of consumers' environmental awareness, thereby refining Signaling Theory by showing that the effectiveness of green marketing signals depends on their informational complexity rather than being uniform across all signal types.

6.9 Limitations

There are a number of limitations in this study. In the first, the sample was limited to consumers of Lagos State supermarkets, and extrapolation to other states in Nigeria, to informal retail markets, and to sub-Saharan Africa in general was not possible. Second, the cross-sectional nature does not allow drawing causal conclusions on the temporal dynamics of green marketing exposure and behavioral response. Third, self-reported buying behavior is prone to the social desirability bias, especially when it comes to sustainability issues. Fourth, the PLS-SEM methodology of the research, though suitable to explore and test a model confirmatively, is not able to offer the same model fit assessment as CB-SEM. Longitudinal designs, objective purchase records, multi-country African samples, and CB-SEM validation are some of the ways in which future research could overcome these limitations.

7. Conclusion

This study explored the impact of eco-labeling, green packaging, and environmental advertising on consumer purchasing behavior in supermarkets in Lagos State, Nigeria, with environmental awareness serving as a moderating factor. The findings indicate that all three green marketing strategies positively influence consumer purchasing behavior, with eco-labeling having the strongest effect. Environmental awareness was found to significantly moderate the relationship between eco-labeling and consumer behavior, as well as the relationship between environmental advertising and consumer behavior. However, the moderating effect of green packaging was not significant.

8. Recommendation

In line with the findings of the study, it was recommended that, supermarkets in Lagos State should establish combined green marketing strategies that will focus on investment in eco-certification of their largest volume products supported by consumer environmental education programs that will create the awareness substrate needed to maximize the returns of eco-labeling and advertising. Supermarkets in Lagos State should create social media environmental advertising campaigns for the high-penetration Instagram, TikTok, and WhatsApp platforms of Lagos State, featuring believable, locally resonant environmental narratives instead of generic global sustainability messages. The study suggests to future researchers' longitudinal designs to trace the dynamic association between environmental awareness and green marketing responsiveness over time, multi-country West African research to contextualize the Lagos results, and experiments to determine causal processes between particular green marketing cues and the buying behavior in controlled retail contexts.

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Appendix

Variable	Questionnaire Items
Eco-labeling (EL)	1. I trust eco-label certifications on products, believing they accurately reflect the environmental quality of the product. 2. I find the information on eco-labels clear and understandable, making it easy to make informed purchase decisions. 3. Eco-labels influence my purchase decisions by making me prefer products with verified environmental claims. 4. I actively seek products with eco-labels over conventional products when shopping in supermarkets. 5. Eco-labels increase my willingness to pay a premium for sustainable products, even if they cost more than standard alternatives.
Green Packaging (GP)	1. Products I purchase use biodegradable packaging materials, which reduces their impact on the environment. 2. I choose products whose packaging is recyclable to minimize waste and support sustainability. 3. Packaging avoids excess materials, reflecting a conscious effort by producers to reduce environmental harm. 4. I prefer products with environmentally friendly packaging even when other features are similar. 5. Green packaging influences my purchasing decisions by motivating me to support brands that adopt sustainable practices.
Environmental Advertising (EA)	1. Environmental claims in advertisements are believable and influence my perception of a product's sustainability. 2. I notice green advertisements frequently, which raises my awareness of environmentally friendly options. 3. Green advertising motivates me to act sustainably, such as choosing eco-friendly products over conventional ones. 4. Environmental advertising influences my eco-friendly product choices by providing credible information on sustainability benefits. 5. I trust companies that advertise environmental benefits, perceiving them as committed to responsible practices.
Consumer Purchasing Behavior (CPB)	1. I prioritize eco-friendly products when shopping, even if other products are cheaper or more convenient. 2. I frequently purchase green products as part of my regular shopping habits. 3. I am willing to pay a premium for environmentally friendly products because I value sustainability. 4. I choose products that minimize environmental harm whenever possible, considering their ecological impact. 5. I consider sustainability as an important factor when making purchase decisions in supermarkets.

Variable	Questionnaire Items
Environmental Awareness (EnvA) [Moderator]	1. I am knowledgeable about environmental issues and understand their impact on society and ecosystems. 2. I am concerned about ecological degradation caused by human activities and seek ways to reduce my own impact. 3. I am aware of sustainable practices that reduce environmental harm and attempt to apply them in daily life. 4. I actively seek information about the environmental impact of products to make better purchase choices. 5. I consider the environmental consequences of my consumption choices when deciding what to buy.