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Consumer Preference For Eco-Friendly Products: A Market Experiment Approach

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Abstract: This study examines consumer preferences for environmentally friendly products using a market experiment approach. Grounded in consumer preference theory, green consumer behavior, and the Theory of Planned Behavior, the research aims to identify key determinants influencing actual consumer choices. A quantitative experimental design was employed, involving 240 respondents, in which product attributes such as price, quality, eco-label, packaging, and environmental value were systematically manipulated. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results reveal that all variables significantly influence consumer preferences, with perceived quality and price emerging as the most dominant factors. Environmental value, eco-label, and packaging also have positive effects, although with relatively lower impact. These findings indicate that consumer decisions are primarily driven by utilitarian considerations, while environmental awareness functions as a supporting factor. The study also highlights the persistence of the attitude–behavior gap, where pro-environmental attitudes do not always translate into actual purchasing behavior. This research contributes theoretically by integrating economic and behavioral perspectives to understand sustainable consumption, and methodologically by applying a market-experiment approach to capture real choice behavior. Practically, the findings suggest that firms should prioritize product quality and competitive pricing while strengthening credible environmental communication to enhance consumer adoption of green products.

Keywords: Consumer Preferences, Environmentally Friendly Products, Green Consumer Behavior, Market Experiment, Sustainable Consumption.

INTRODUCTION

Environmental sustainability issues have become a strategic priority in the modern global economy, amid increasing pressures from resource scarcity, climate change, and environmental degradation. The transformation towards a sustainable economy requires not only changes in the production side, but also in people's consumption patterns. In this context, consumer behavior plays a key role in driving the success of the market for environmentally friendly products, i.e., products designed to minimize environmental impacts throughout their life cycle.

These changes in consumption patterns are inseparable from the dynamics of consumer preferences, which form the foundation of microeconomics for explaining demand behavior. Consumer preference theory describes how individuals make choices among alternative goods and services under resource constraints, such as prices and income. Preferences are represented by the relationship among choices, utilities, and budget constraints, where individuals are assumed to have complete and transitive preferences and to seek to maximize the utility of their consumption. (Le & Yu, 2024; Moscati, 2019). Within this framework, the revealed preference approach allows the inference of preferences from observed choice behavior, thus providing a strong empirical foundation for demand analysis and the measurement of well-being. (Le & Yu, 2024; Moscati, 2019).

Although consumer preference theory provides a solid analytical framework, it has not fully explained the complexity of eco-friendly consumption behaviors, which are also influenced by psychological, social, and normative factors. Therefore, the green consumer behavior literature develops by integrating economic perspectives with behavioral approaches. Green consumption values, pro-environmental attitudes, social norms, and product value perceptions have been shown to play an important role in shaping purchasing decisions for environmentally friendly products. (Kayani et al., 2023; Paço et al., 2019; Temizkan, 2022).

One of the dominant theoretical frameworks for explaining such behavior is the Theory of Planned Behavior (TPB), which posits that individual behavior is influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control. (Ilagan et al., 2024; Liu et al., 2017). In the context of green consumption, attitudes reflect an evaluation of the product's environmental benefits, subjective norms concern social pressures or moral values, and behavioral control reflects an individual's ability to access the product, particularly in terms of price and availability. Thus, TPB complements the theory of consumer preferences by incorporating psychological and social dimensions that are not fully accounted for in traditional utility models.

The integration between economic and behavioral perspectives is important in understanding consumer preferences for environmentally friendly products. From an economic perspective, consumption decisions are based on utility maximization, taking into account product attributes such as price and quality. (Le & Yu, 2024). Meanwhile, from a behavioral perspective, the SDGs explain how values, attitudes, and social norms affect actual intentions and behaviors. (Ilagan et al., 2024; Liu et al., 2017). These two frameworks complement each other: consumer preference theory explains how decisions are made based on economic rationality, while SDGs explain why psychological and social factors influence those decisions. This synthesis provides a more comprehensive understanding of the formation of consumer preferences in the context of sustainability.

In the context of eco-friendly products, utilitarian attributes such as price and quality remain key determinants of purchasing decisions, while symbolic attributes, such as eco-friendly packaging and labels, serve as information signals that enhance consumer perceptions of value and trust. (Nekmahmud & Fekete-Farkas, 2020; Tan et al., 2022). Eco-labels, as credence attributes, help reduce information asymmetry between producers and consumers. However, their effectiveness depends on the credibility of certification bodies and on the risk of greenwashing. (Nygaard, 2023; Testa et al., 2013). In addition, green consumer behavior is heterogeneous and influenced by demographic factors and cultural contexts, which underscores the importance of research approaches capable of capturing this complexity. (Kowalska et al., 2021).

Although the literature on green consumer behavior has grown rapidly, a research tension remains unresolved. First, most studies still use a survey-based approach that focuses on perception and purchase intent, making it vulnerable to social desirability bias and less able to capture actual consumer behavior. Second, experimental studies on consumer preferences for eco-friendly products remain limited, especially in developing countries with distinct market

characteristics, such as high price sensitivity and varying levels of environmental literacy. This gap underscores the need for a more robust methodological approach to better, more accurately, and in context understand consumption behavior.

The market experiment approach offers a solution to overcome these limitations by allowing the manipulation of product attributes in a controlled environment that resembles real market conditions. This approach aligns with the principle of revealed preference, which infers preferences from consumers' actual choices and enables the identification of causal relationships between product attributes and purchasing decisions. (Newell & Holian, 2017; Terán et al., 2024). In addition, the use of agent-based simulations in market experiments enables a deeper understanding of the dynamics of interaction among market participants and the consumer learning process. (Lincoln et al., 2012; Santos & Saraiva, 2021).

Based on this description, the purpose of this study is to analyze consumer preferences for environmentally friendly products using a market experiment, integrating perspectives from consumer preference theory and the Theory of Planned Behavior. Specifically, this study examines the influence of environmental values, price perceptions, quality perceptions, eco-packaging, and eco-labels on consumer preferences in conditions that resemble real markets.

METHOD

This study uses a quantitative approach with a market experiment design to analyze consumer preferences for environmentally friendly products. This approach was chosen because it allows the identification of causal relationships between product attributes and consumer decisions by manipulating variables in a controlled environment that still resembles real market conditions. In contrast to the conventional survey approach, which measures only intentions or perceptions, market experiments allow direct observation of actual choice behavior, which is more consistent with the principle of revealed preference in consumer preference theory. Within this framework, individual preferences are not measured through attitude statements but inferred from the choices consumers make when faced with various product alternatives under budget constraints. (Le & Yu, 2024; Moscati, 2019). This approach offers advantages in improving the internal validity of research and reducing the social biases that often arise in perception-based studies.

The experimental design is an inter-subject design, in which each respondent is exposed to only one product selection scenario with a specific combination of attributes. This design allows isolating the influence of each attribute on consumer preferences and avoiding the learning effect that can occur when respondents are given the same treatment repeatedly. Theoretically, this approach aligns with the concept of utility in microeconomics, which holds that individuals make choices based on evaluating combinations of product attributes that provide the highest level of satisfaction. (Dimand, 2023; Le & Yu, 2024). In addition, this approach accounts for the fact that consumer preferences are dynamic and can change depending on context, information, and consumption experience. (Le & Yu, 2024).

The population in this study consists of consumers who have purchased daily-use products, particularly household products related to sustainability, such as those with environmentally friendly packaging and materials. The sampling technique used was purposive sampling with the following criteria: (1) having bought daily consumption products, (2) having a basic understanding of environmentally friendly products, and (3) being at least 17 years old. The sample size was set at 240 respondents, considered adequate to capture variation in consumer preferences and support the structural model analysis. The selection of this sample size also took into account the need to capture the heterogeneity of green consumer behavior, influenced by social, cultural, and economic factors (Kowalska et al., 2021).

The experiment was designed as a market simulation that manipulated the four main attributes of an eco-friendly product: price, product quality, eco-friendly packaging, and eco-friendly labels. Each attribute has two levels of variation: low and high price; standard and

premium quality; eco-friendly and conventional packaging; and the presence or absence of eco-labels. The combination of these attributes yields multiple product scenarios, which are randomly distributed to respondents. In each scenario, respondents were asked to choose the one product they preferred the most from the available alternatives. Price variation is used to test consumer sensitivity to costs associated with the substitution and income effects in demand theory. Meanwhile, quality attributes reflect the product's functional benefits, which are a key determinant of purchasing decisions. (Tan et al., 2022). Packaging and eco-labels serve as informational signals that help consumers evaluate products, especially under information asymmetry, where eco-labels are considered credence attributes that require trust in information sources. (Nygaard, 2023). To improve conceptual clarity, the operational definitions of variables are presented in the following table.

Table 1. Variable Operational Definition

Variable	Operational Definition	Indicators	Measurement Scale	Sources
Environmental Value	The degree to which individuals demonstrate concern and moral responsibility toward environmental sustainability in their consumption decisions.	Environmental concern, moral responsibility, commitment to sustainability	Likert Scale (1 = strongly disagree to 5 = strongly agree)	(Kayani et al., 2023; Paço et al., 2019; Temizkan, 2022)
Price Perception	Consumers' evaluation of the fairness and affordability of environmentally friendly products relative to their perceived benefits.	Price fairness, affordability, value for money	Likert Scale (1–5)	(Nekmahmud & Fekete-Farkas, 2020)
Perceived Quality	Consumers' assessment of the functional performance and reliability of environmentally friendly products.	Product reliability, durability, performance	Likert Scale (1–5)	(Tan et al., 2022)
Eco-Friendly Packaging	Consumers' perception of the use of environmentally sustainable materials and designs in product packaging.	Recyclability, use of eco-friendly materials, and environmentally responsible design	Likert Scale (1–5)	(Paço et al., 2019)
Eco-Label	Consumers' perception of the presence and credibility of environmental certification labels as signals of product sustainability.	Label clarity, credibility certification, and trust in the eco-label	Likert Scale (1–5)	(Nygaard, 2023; Testa et al., 2013)
Consumer Preference	The tendency of consumers to choose environmentally friendly products over conventional alternatives is reflected in both actual choices and evaluative ratings.	(1) Product choice in experimental scenarios (dummy: 1 = chosen, 0 = not chosen); (2) Degree of liking toward the selected product	Choice-based and Likert Scale (1–5)	(Le & Yu, 2024; Moscati, 2019)

Source: Adapted from Kayani et al. (2023); Nekmahmud and Fekete-Farkas (2020); Tan et al. (2022); Paço et al. (2019); Nygaard (2023); Le and Yu (2024); Moscati (2019).

Data collection is carried out through two main stages. The first stage is the implementation of a market experiment simulation, in which respondents are presented with a product selection scenario featuring different combinations of attributes. The second stage involves completing a structured questionnaire to measure respondents' perceptions of the research variables. The integration of behavioral and perceptual data enables a more comprehensive analysis of the relationships among values, attitudes, and consumer behavior. (Paço et al., 2019).

Data analysis was carried out using Partial Least Squares Structural Equation Modeling (PLS-SEM). This method was chosen because it can analyze complex models, does not require the assumption of data normality, and is suitable for medium sample sizes, as in this study. The analysis was carried out in two stages, namely the evaluation of the measurement model (outer model) to test the validity and reliability of the construct through the value of the loading factor, Composite Reliability, and Average Variance Extracted (AVE), and the evaluation of the structural model (inner model) to test the causal relationship between variables through the path coefficient) and the value of the determination coefficient (R^2) (Henseler et al., 2015).

To ensure the validity of the research results, several control measures were implemented, including randomization of experimental conditions, control of external variables, and standardization of experimental procedures across all respondents. This principle aligns with a market-experiment approach that emphasizes control, replication, and transparency in research design to produce robust, replicable findings. (Newell & Holian, 2017; Terán et al., 2024).

RESULTS AND DISCUSSION

This study involved 240 respondents who are consumers of daily consumption products in urban areas and their surroundings. Respondent characteristics are presented to provide an overview of the respondents' demographic profile, which is the basis for analyzing consumer preferences for environmentally friendly products. The characteristics of the respondents can be seen in the table below:

Table 2. Characteristics of Respondents by gender

Gender	Number (People)	Percentage (%)
Male	108	45,0
Women	132	55,0
Total	**240**	**100**

Source: SmartPls 4 Data Processing Results 2025

Table 2 above shows that the majority of respondents were female (55.0%), reflecting women's role as the main decision-makers in household product purchases and daily consumption.

Table 3. Characteristics of Respondents by Age

Age	Number (People)	Percentage (%)
18-25 Years	78	32,5
26-35 Years	92	38,3
36-445 Years	46	19,2
>45 Years	24	10,0
Total	**240**	**100**

Source: SmartPls 4 Data Processing Results 2025

Table 3 above shows that respondents are dominated by the productive age group (18–35 years) at 70.8%, which is the most active and adaptive consumer segment towards innovative products and environmental sustainability issues.

Table 4. Characteristics of respondents based on Education Level

Education Level	Number (People)	Percentage (%)
High School/Vocational School	62	25,5
Diploma (D3)	44	18,3
Bachelor (S1)	102	42,5
Postgraduate (S2/S3)	32	13,4
Total	**240**	**100**

Source: SmartPls 4 Data Processing Results 2025

Table 4 above shows that the majority of respondents hold a bachelor's degree (42.5%), indicating that they have a relatively adequate cognitive capacity to understand the attributes of eco-friendly products, such as labels, quality, and packaging.

Overall, the characteristics of the respondents in this study indicate that the sample is dominated by individuals of productive age, with middle to high levels of education, and is fairly balanced in terms of gender. This composition is considered representative for analyzing consumer preferences for environmentally friendly products. The characteristics of the respondents also support the external validity of the study, as the productive, highly educated age groups are the most responsive to sustainability and the innovation of environmentally friendly products.

The evaluation of the measurement model aims to ensure that each indicator used in this study is valid and reliable in representing latent constructs. Convergent validity is assessed through loading factor values and Average Variance Extracted (AVE).

Table 5. Outer Loading

Construct	Indicators	Loading Range	AVE	Composite Reliability	Cronbach Alpha
Environmental Value	X1.1–X1.4	0.747–0.858	0.662	0.868	0.837
Price Perception	X2.1–X2.4	0.726–0.826	0.630	0.832	0.816
Quality Perception	X3.1–X3.4	0.788–0.846	0.683	0.866	0.848
Packaging	X4.1–X4.4	0.804–0.883	0.693	0.930	0.856
Eco-Friendly Labels	X5.1–X5.4	0.831-0.868	0.710	0.883	0.865
Consumer Preferences	Y.1–Y.4	0.648-0.755	0.500	0.669	0.666

Source: SmartPls 4 Data Processing Results 2025

The results of the measurement model evaluation showed that most indicators had outer loadings above 0.70, indicating a strong ability to represent their latent constructs. These findings confirm that the research instrument has good convergent validity, so that each construct can be measured accurately.

However, one indicator in the consumer preference variable has an outer loading of 0.648, slightly below the recommended threshold. In the context of Partial Least Squares Structural Equation Modeling (PLS-SEM), indicators with an outer loading value between 0.60 and 0.70 can still be maintained as long as the construct meets other convergent validity criteria, such as Average Variance Extracted (AVE) values that exceed 0.50 and Composite Reliability, which is above 0.70. Therefore, the indicator is retained because it contributes to the conceptual representation of consumer preferences and does not diminish the overall quality of the measurement model.

In addition, the reliability test results showed that the entire construct had Cronbach's Alpha and Composite Reliability values above 0.70, indicating good internal consistency. Although the consumer preference variable shows a lower Cronbach's Alpha than other constructs, its Composite Reliability still meets the required criteria. In the PLS-SEM approach, Composite Reliability is considered a more representative measure than Cronbach's Alpha because it does not assume that each indicator contributes equally (tau-equivalence). Thus, all constructs in this study can be declared reliable and valid for further analysis.

Table 6. Discrimination Validity Test (HTMT)

	Packaging (X4)	Eco-Label (X5)	Environmental Value (X1)	Price Perception (X2)	Quality Perception (x3)	Consumer Preferences (Y)
Packaging (X4)						
Eco-Label (X5)	0.141					
Environmental Value (X1)	0.119	0.165				
Price Perception (X2)	0.076	0.068	0.070			
Quality Perception (X3)	0.063	0.059	0.123	0.114		
Consumer Preferences (Y)	0.270	0.377	0.342	0.372	0.375	

Source: SmartPls 4 Data Processing Results 2025

Furthermore, the discriminant validity test using the HTMT criteria showed that all values were below the 0.90 threshold. This indicates that each construct has clear conceptual differences and that there is no overlap between variables. Overall, these results indicate that the measurement model meets all validity and reliability criteria, allowing structural model testing to proceed.

Evaluation of Structural Models (Inner Model)

Table 7. R-Square Value

	R-square	R-square adjusted
Consumer Preferences (Y)	0.358	0.344

Source: SmartPls 4 Data Processing Results 2025

An R^2 of 0.358 indicates that 35.8% of the variation in consumer preferences is explained by environmental value, price perception, quality perception, packaging, and environmentally friendly labels. This value falls into the moderate category, indicating that the model has fairly good predictive ability.

Path Coefficient Test

Table 8. Bootstrapping Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EV -> CP	0.255	0.260	0.045	5.657	0.000
PP -> CP	0.318	0.321	0.051	6.231	0.000
QP -> CP	0.321	0.324	0.048	6.767	0.000
P -> CP	0.141	0.148	0.050	2.806	0.005
EL -> CP	0.227	0.227	0.055	4.100	0.000

Source: SmartPls 4 Data Processing Results 2025

Table 8 above shows that bootstrapping results with 5000 subsamples indicate that all paths of independent intervariable relationships with consumer preferences are positive and significant (p-value < 0.05). These findings confirm that each attribute of an eco-friendly product has a role in shaping consumer preferences.

Relative to other factors, quality perception and price perception have the largest influence coefficients, followed by environmental value, eco-label, and packaging. This shows that, in addition to environmental idealism, rational considerations of quality and price remain the main determinants of consumer decision-making.

Table 9. Effect Size (f2)

Variable	F2	Categories
Environmental Value (X1)	0.098	Small
Price Perception (X2)	0.157	Medium
Quality Perception (X3)	0.160	Medium
Packaging (X4)	0.030	Small
Eco-Label (X5)	0.077	Small

Source: SmartPls 4 Data Processing Results 2025

Table 9 above shows that the f² values indicate that quality perception and price perception have a moderate contribution to consumer preferences. In contrast, environmental value, eco-label, and packaging have a small contribution. These findings indicate that while environmental awareness is important, consumers' purchasing decisions remain dominated by utilitarian and economic factors.

Predictive Relevance (Q²)

A Q² value of 0.305 (>0) indicates that the model has good predictive relevance in predicting consumer preference for environmentally friendly products (Stone, 1974). Thus, the model not only explains the relationships between variables but also has predictive power for new observational data.

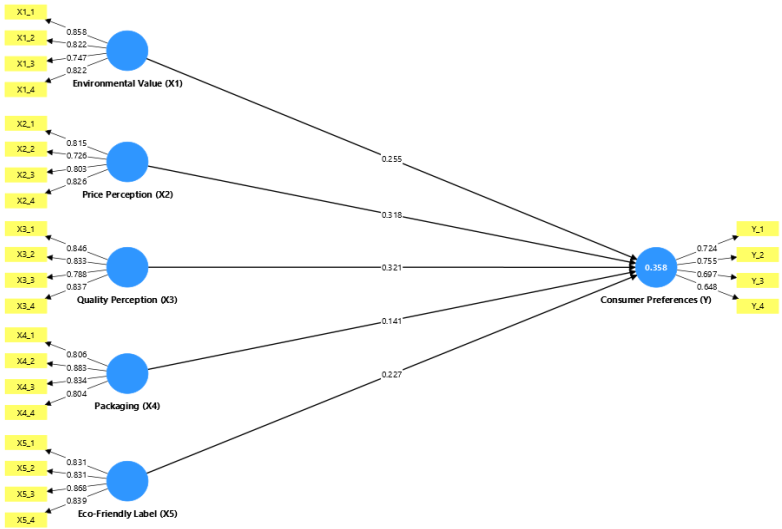

Figure 1. Algorithm Model

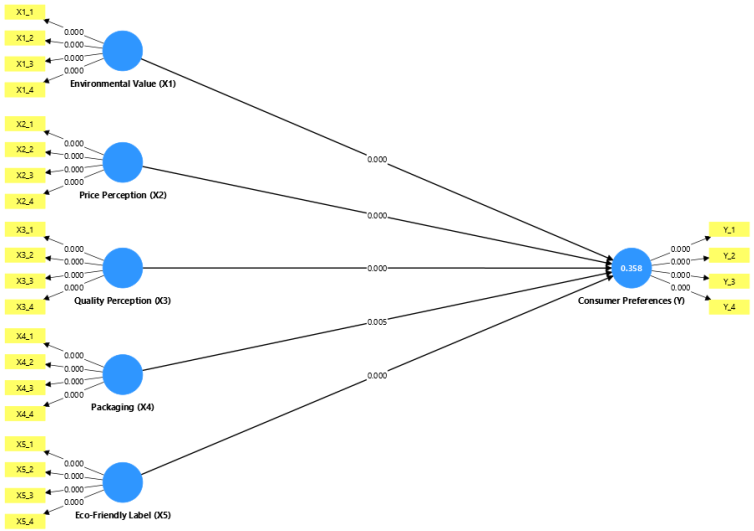

Figure 2. Bootstrapping Model

The results of this study provide a deeper understanding of the dynamics of consumer preferences for environmentally friendly products through a market experiment approach. The study's findings show that consumer preferences are influenced not only by environmental awareness but also by utilitarian considerations of quality and price. This interpretation confirms that environmentally friendly consumption decisions result from the interaction between economic rationality and normative factors, thereby enriching the understanding of sustainable consumption behavior.

Furthermore, from the perspective of consumer preference theory, these findings reinforce the assumption that individuals make decisions by maximizing utility subject to a budget constraint. (Le & Yu, 2024; Moscati, 2019). Nevertheless, this study shows that consumer preferences have evolved from a neoclassical model that focuses solely on economic attributes to a more multidimensional model. Non-economic attributes, such as environmental value, eco-labels, and eco-friendly packaging, also affect the utility that consumers feel. Thus, this research makes a theoretical contribution by expanding the concept of utility to include moral and social dimensions in the context of sustainable consumption.

Further, the dominance of perceptions of quality and price suggests that utilitarian factors remain the main determinants of consumer preferences. These findings align with demand theory, which emphasizes that consumption decisions are shaped by the trade-off between benefits and costs, with consumers typically choosing products that offer the best value for the money. (Nekmahmud & Fekete-Farkas, 2020; Tan et al., 2022). In the context of eco-friendly products, this indicates that sustainability cannot stand alone as a determining factor, but must be supported by superior product quality and competitive prices. Therefore, the successful market penetration of green products depends heavily on manufacturers' ability to integrate sustainability with real functional value for consumers.

On the other hand, from the perspective of the Theory of Planned Behavior (TPB), the positive influence of environmental values on consumer preferences emphasizes the importance of attitudes and moral norms in shaping environmentally friendly consumption behavior. (Ilagan et al., 2024; Kayani et al., 2023; Liu et al., 2017; Paço et al., 2019). However, the relatively lower influence of pro-environmental values and attitudes compared to utilitarian factors suggests that they do not always translate into real purchasing behavior. This phenomenon reflects the attitude–behavior gap, in which positive intentions towards the environment are constrained by practical considerations such as price, quality, and product availability. (Mastria & Cesarei, 2023). Thus, this study confirms that integrating economic and

behavioral perspectives is necessary to explain consumer preferences for environmentally friendly products comprehensively.

In addition, the role of eco-labels in this study underscores the importance of information-signaling mechanisms in reducing information asymmetry between producers and consumers. As a credibility attribute, eco-labels increase consumer confidence in a product's environmental claims, thereby strengthening preferences for eco-friendly products. (Nygaard, 2023). However, its lower influence relative to quality and price suggests that label effectiveness depends heavily on its credibility and relevance to the product's functional benefits. This confirms that the environmental communication strategy must be supported by tangible product performance to have a greater impact on purchasing decisions.

Furthermore, eco-friendly packaging also shows an important role as a symbolic communication element that reinforces the product's sustainability image. (Paço et al., 2019). Although its contribution is not dominant, eco-friendly packaging remains important for building value perception and product differentiation. These findings suggest that symbolic attributes serve as complementary factors that reinforce purchasing decisions, but cannot replace the role of utilitarian attributes in determining consumer preferences.

Furthermore, this research makes a significant theoretical contribution by integrating consumer preference theory and the Theory of Planned Behavior. This integration results in a more comprehensive conceptual framework for explaining environmentally friendly consumption behavior. If consumer preference theory explains decisions through utility maximization, then TPB complements this framework by incorporating psychological and social factors that shape intentions and behaviors. Thus, consumer utility is not only economic but also encompasses moral and social values relevant to sustainability.

In addition, the novelty of this research lies in its use of a market experiment approach, which enables observation of actual consumer behavior. This approach provides empirical evidence for the concept of revealed preference, which holds that consumer preferences are inferred from actual choices rather than from attitude statements. (Le & Yu, 2024; Moscati, 2007). In addition, market experiments allow the identification of causal relationships among variables and the analysis of heterogeneity in consumer behavior, which is important for understanding the market dynamics of eco-friendly products. (Newell & Holian, 2017; Terán et al., 2024). Another novelty is the provision of empirical evidence from developing countries, which remains relatively limited in the literature on consumer preferences for environmentally friendly products.

Overall, this study's results show that consumer preferences for environmentally friendly products result from an interaction among utilitarian, normative, and informational factors. Utilitarian factors such as quality and price have a dominant influence, while normative factors, such as environmental value, and informational factors, such as eco-labels and packaging, play a supporting role. This hierarchical structure provides a new understanding of the mechanisms underlying the formation of consumer preferences in the context of sustainability.

Finally, the implications of this study's findings confirm that the marketing strategy for eco-friendly products must integrate sustainability with real economic value for consumers. Manufacturers need to ensure that eco-friendly products not only meet sustainability standards, but also offer high quality and competitive prices. In addition, increasing the credibility of eco-labels and the transparency of product information are important steps in building consumer trust. Thus, a holistic, value-based approach is key to driving the widespread adoption of eco-friendly products in society.

CONCLUSION

This study aims to analyze consumer preferences for environmentally friendly products through a market experiment, integrating perspectives from consumer preference theory, green consumer behavior, and the Theory of Planned Behavior (TPB). The results showed that all the

variables tested, namely environmental value, price perception, quality perception, eco-friendly packaging, and eco-friendly labels, had a positive and significant influence on consumer preferences. These findings confirm that green consumption decisions are influenced by a combination of economic and non-economic factors in a market context that resembles real conditions.

Furthermore, the main findings of this study show that consumer preferences for environmentally friendly products are multidimensional, with utilitarian factors, particularly perceptions of quality and price, dominant. This indicates that, despite increasing environmental awareness, purchasing decisions remain driven by rational considerations of a product's functional benefits and affordability. On the other hand, environmental value, eco-labels, and eco-friendly packaging serve as supporting factors that strengthen preferences but are not the main determinants. In addition, this study confirms the existence of an attitude-behavior gap, in which concern for the environment does not always translate into actual purchasing decisions.

Furthermore, from a theoretical perspective, this research makes an important contribution by integrating utility-based consumer preference theory with the behavioral perspective on the SDGs. This integration expands the understanding of consumer preference formation by showing that utility is determined not solely by economic attributes but also by the moral and social values associated with sustainability. Thus, this study offers a more comprehensive conceptual framework for explaining sustainable consumption behavior and confirms the hierarchical structure of the influence of product attributes, with utilitarian factors playing a dominant role and normative and informational factors functioning as support.

In addition to the theoretical contribution, this research also makes a significant methodological contribution. In particular, the use of a market experiment approach allows measurement of consumer preferences from revealed behavior, yielding more valid findings than survey-based approaches, which are prone to perceptual and social desirability biases. Therefore, this study strengthens the empirical evidence on the causal relationship between product attributes and consumer preferences under conditions that resemble those of the real market.

Furthermore, from a practical perspective, the findings of this study provide important implications for business actors and policymakers. For business actors, the marketing strategy for environmentally friendly products should emphasize product quality and competitive pricing as the main factors in attracting consumer interest. In addition, the use of eco-labels and eco-friendly packaging must be supported by credible, transparent information to increase consumer trust. Meanwhile, for policymakers, strengthening the environmental certification system and consumer education programs is a strategic step to encourage wider adoption of environmentally friendly products in the community.

Overall, this study enriches the literature on sustainable consumption behavior by providing a more comprehensive understanding of the determinants of consumer preferences for environmentally friendly products. By integrating economic and behavioral perspectives and adopting a market-experimenting approach, the study provides a strong empirical basis for developing marketing strategies and public policies that support the transition to a more sustainable economy.

REFERENCE

Dimand, R. W. (2023). *Irving Fisher, Ragnar Frisch and the Elusive Quest for Measurable Utility*. https://doi.org/10.31235/osf.io/vmzua

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Ilagan, S. M. C., Ong, A. K. S., German, J. D., Gumasing, Ma. J. J., & Pabalan, K. M. P. (2024). Holistic Antecedent Analysis of Behavioral Intention Among Green Consumers in the Philippines: A Sustainability Theory of the Planned Behavior Approach. *Sustainability*, *16*(10), 3894. https://doi.org/10.3390/su16103894

Kayani, U. N., Haque, A., Kulsum, U., Mohona, N. T., & Hasan, F. (2023). Modeling the Antecedents of Green Consumption Values to Promote the Green Attitude. *Sustainability*, *15*(17), 13111. https://doi.org/10.3390/su151713111

Kowalska, A., Ratajczyk, M., Manning, L., Bieniek, M., & Mącik, R. (2021). "Young and Green": A Study of Consumers' Perceptions and Reported Purchasing Behavior Towards Organic Food in Poland and the United Kingdom. *Sustainability*, *13*(23), 13022. https://doi.org/10.3390/su132313022

Le, T. H., & Yu, K. (2024). Preference Changes and Index Number Theory. *Journal of Economic Surveys*, *39*(4), 1361–1394. https://doi.org/10.1111/joes.12658

Lincoln, R., Galloway, S., Stephen, B., & Burt, G. (2012). Comparing Policy Gradient and Value Function-Based Reinforcement Learning Methods in Simulated Electrical Power Trade. *IEEE Transactions on Power Systems*, *27*(1), 373–380. https://doi.org/10.1109/tpwrs.2011.2166091

Liu, Y., Segev, S., & Villar, M. E. (2017). Comparing Two Mechanisms for Green Consumption: Cognitive-Affect Behavior vs. the Theory of Reasoned Action. *Journal of Consumer Marketing*, *34*(5), 442–454. https://doi.org/10.1108/jcm-01-2016-1688

Mastria, S., & Cesarei, A. D. (2023). Going Green: A Review on the Role of Motivation in Sustainable Behavior. *Sustainability*, *15*(21), 15429. https://doi.org/10.3390/su152115429

Moscati, I. (2007). Early Experiments in Consumer Demand Theory: 1930-1970. *History of Political Economy*, *39*(3), 359–401. https://doi.org/10.1215/00182702-2007-015

Moscati, I. (2019). *Not a Behaviorist: Samuelson's Contributions to Utility Theory in the Harvard Years, 1936–1940*. 243–278. https://doi.org/10.1057/978-1-137-56812-0_11

Nekmahmud, M., & Fekete-Farkas, M. (2020). Why Not Green Marketing? Determinants of Consumers' Intention to Green Purchase Decision in a New Developing Nation. *Sustainability*, *12*(19), 7880. https://doi.org/10.3390/su12197880

Newell, G. D., & Holian, M. J. (2017). An Agent-Based Model of Entrepreneurship. *Journal of Entrepreneurship and Public Policy*, *6*(2), 259–270. https://doi.org/10.1108/jepp-01-2015-0003

Nygaard, A. (2023). Is Sustainable Certification's Ability to Combat Greenwashing Trustworthy? *Frontiers in Sustainability*, *4*. https://doi.org/10.3389/frsus.2023.1188069

Paço, A., Shiel, C., & Alves, H. (2019). A New Model for Testing Green Consumer Behavior. *Journal of Cleaner Production*, *207*, 998–1006. https://doi.org/10.1016/j.jclepro.2018.10.105

Santos, A. F. d., & Saraiva, J. T. (2021). Agent-Based Models in Power Systems. *U Porto Journal of Engineering*, *7*(3), 101–113. https://doi.org/10.24840/2183-6493_007.003_0009

Tan, Z., Sadiq, B., Bashir, T., Mahmood, H., & Rasool, Y. (2022). Investigating the Impact of Green Marketing Components on Purchase Intention: The Mediating Role of Brand Image and Brand Trust. *Sustainability*, *14*(10), 5939. https://doi.org/10.3390/su14105939

Temizkan, V. (2022). Investigating the Effect of Consumers' Environmental Values on Green Buying Behavior. *Business and Economics Research Journal*. https://doi.org/10.20409/berj.2022.386

Terán, O., Leger, P., & López, M. (2024). Factors That Drive Market Share and the Oligopolistic Character of Cross-Border B2C E-Commerce: An Agent-Based

Scenario-Analysis Approach. *Simulation*, *101*(4), 429–452. https://doi.org/10.1177/00375497241296542

Testa, F., Iraldo, F., Vaccari, A., & Ferrari, E. (2013). Why Eco-labels Can Be Effective Marketing Tools: Evidence From a Study on Italian Consumers. *Business Strategy and the Environment*, *24*(4), 252–265. https://doi.org/10.1002/bse.1821