

CONSUMER BEHAVIOR | RESEARCH ARTICLE

Towards a Greener Future: Factors Impacting Eco-Friendly Shopping Bag Adoption in Retail Sector

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Abstract: Green consumer behavior relates to product usage that considers environmental impact, such as utilizing eco-friendly shopping bags instead of plastic bags. Internal and external factors, including awareness, expectations, and eco-friendly product marketing influence this behavior. This study analyzes the factors influencing green consumer behavior regarding eco-friendly shopping bag usage. Data were collected from 115 modern retail customers using convenience sampling. The analysis employed descriptive and structural equation modelling techniques. Results indicate that eco-friendly shopping bags as a means to protect future generations from plastic waste's negative impacts while reducing current environmental plastic waste. The study found that waste sorting and product reuse can overcome the problem of environmental plastic waste. Environmental protection awareness and products marketing significantly influence green consumer behavior. Public awareness of environmentally friendly products can be enhanced through green marketing, which includes disseminating knowledge and information about green consumer behavior. This study suggests that improving public awareness requires promoting environmental protection through eco-friendly product marketing. Additionally, incorporating environmental behavior knowledge into marketing activities can increase green consumer behavior among shopping bag users.

Keywords: environmental attitude, environmental concern, environmental knowledge, green consumer behavior, plastic waste

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PUBLIC INTEREST STATEMENT

Factors influencing green consumer behavior are various. The result of this study only emphasizes a small part of the many factors driving people's environmentally friendly behavior. Moreover, this study only focused specific on the plastic bag usage in modern retail which is currently regulated by the government. In fact, the use of plastic shopping bags is still widely used in other conditions and transactions. Implementation of the environmentally friendly behavior requires all parties, whether the government, entrepreneurs or environmentally friendly product companies, or the community itself to have their respective roles in encouraging behavioral changes in an environmentally friendly direction.



1. Introduction

The increase in plastic use in daily life occurs because people consume more products in line with the increase in the overall population. This results in an increase in plastic waste, which can impact environmental pollution because plastics are difficult to decompose in the environment. Indonesia produced 22.97 million tons of waste in 2023, of which plastic waste accounts for 18.72% of the total (Ministry of Environment and Forestry, 2023). One type of plastic waste commonly found in plastic bags is made from High-Density Polyethylene (HDPE), which is often used for daily shopping needs and provided in the retail market. The characteristics of HDPE plastic that make it commonly used are its lightweight, cheap cost, and strong durability (Ahamed et al., 2021). In order to overcome the problem of increasing plastic bag waste, the government, community, and business actors, such as modern retailers, have an important role in reducing and limiting the use of single-use plastic bags. This will lead to an effort to form environmentally friendly behavior among all levels of society.

As one of the cities that produces plastic waste, South Tangerang City produced 369,177 tons of waste in 2023, of which 15.27% is plastic waste (Ministry of Environment & Forestry, 2023). This number has the potential to increase because plastic bags are still widely used by people, especially for daily shopping needs. Although the use of plastic is common in everyday life, it has negative environmental impacts in various aspects (Zambrano-Monserrate & Ruano, 2019). Due to its materials being made from hazardous materials, it potentially causes harm to the community's health. In addition, waste not sorted from its source causes plastic bag waste to be transported directly to the final processing site (TPA) or even thrown directly into the environment. At the end of its life cycle, plastic bags require an adequate collection and separation process to be managed efficiently (United Nations Environment Program, 2020). A study by Ilyas et al. (2018) stated that plastic waste is difficult to decompose and potentially exposes a pollution issue. The use of plastic bags is contradictory because of its worrying environmental impact in the long term. Plastic waste in the environment can be eaten by animals, causing their death. Regarding water regulation, plastic waste can block water flows and cause flooding (Hanun et al., 2019). Specific to HDPE plastic waste, it will expose soil, water, and marine pollution, potentially disrupting the ecosystem (Afzal et al., 2012).

In order to minimize pollution due to the utilization of single-use plastic bags, common alternatives provided for the consumer are paper bags and reusable cloth/fabric bags (often called "goodie bags"). However, even environmentally friendly shopping bags such as paper bags and goodie bags also negatively impact the environment over their life cycle. While single-use plastic bags have the worst potential impact on solid waste in the environment, it does not mean they are the absolute worst choice, so the order of the "best" shopping bags that can be used cannot be determined based on one aspect alone United Nations Environment Programme (UNEP) (2020). The use of any shopping bag, including environmentally friendly options, will have some economic impact due to factors like CO² emissions, water use, and fossil fuel consumption. As UNEP (2020) states, there are no specific "best" alternative shopping bag since all types have their own environmental and economic impacts.

South Tangerang City Government has a regulation regarding the transition from the use of single-use plastic bags to environmentally friendly shopping bags such as reusable polypropylene (PP) and paper bags, which is contained in South Tangerang Mayor Regulation No. 83 Year 2022 concerning Reducing Plastic Waste. Regulations governing the use of plastic bags in South Tangerang City are important so that efforts to reduce plastic bag waste can be carried out on a larger scale and have a positive impact on the environment. The success of implementing this relatively new regulation is related to

people's behavior in using environmentally friendly shopping bags. Policy related to the minimization of plastic bag usage aims to protect the environment by encouraging consumer behavior (Khan et al., 2020). According to An and Yilmaz (2017), legal coercion and social pressure can encourage individual changes in using environmentally friendly goods, especially the use of alternative shopping bags compared to single-use plastic bags. Apart from that, this also needs to be supported by the way people choose the shopping bags they use. Therefore, people's preferences in choosing other alternatives to single-use plastic bags or purchasing paid plastic bags can influence environmentally friendly consumer behavior or people's environmentally friendly behavior towards plastic bags. Previous studies related to the green consumer behavior of plastic bags have been conducted in several countries, as well as other regions in Indonesia. However, research related to South Tangerang City as one of the cities that has their own regulation on plastic bag usage is still relatively minimal. This study will fill the gap in research conducted at South Tangerang City.

Green consumer behavior theory is related to behavior where individuals use or consume goods with concern for the environment and aim to reduce the negative impact of these activities on the environment (Li et al., 2020). As the study refers to the norm activation theory and pro-environmental behavior as the basis theory to analyze the community's behavior, daily activities by the community that may affect the environment should be considered, such as using single-use plastic bags. In the study of Rabiun and Jaeger-Erben (2024), the urgency to implement a production and consumption system that uses a decarbonize and de-fossilize is globally recognized. The implementation should be complemented by the resource use, which is embedded with the community's daily activity.

Therefore, in connection with environmentally friendly or green consumer behavior, understanding the use of environmentally friendly shopping bags is important as a basis for providing environmentally friendly shopping bags to the public. Single-use plastic bags are still one of people's choices due to their ease of use, while environmentally friendly products are not yet fully accepted by everyday consumers, and there are still obstacles to their use (Hasan et al., 2018). The choice of alternatives to single-use plastic bags is influenced by the behavior of consumers who care about the environment, with factors that encourage environmentally friendly behavior being the driving force in choosing alternative uses such as eco-friendly bags. Environmentally conscious consumer behavior is behavior in which consumers use products by considering their impact on the environment. Through policies related to plastic bags that support environmental sustainability, individual environmentally friendly behavior can be influenced by pro-environmental political actions in implementing policies launched by the government (Utami, 2020). As for the research gap, there are few studies related to eco-friendly bag usage in South Tangerang City, especially after the government regulation stipulated. Based on the background and description of the problem, this study aims to analyze the driving factor of the green consumer behavior to use environmentally friendly shopping bags in South Tangerang City, Banten Province, Indonesia.

2. Literature Review

2.1 Green Consumer Behavior

Individual behavior in implementing green consumer behavior is a focused topic and concept by several researchers (Nguyen et al., 2023; Ogiemwongi, 2021; Kumar et al., 2021; Solekah et al., 2024). The theoretical concept of green consumer behavior in reducing plastic use refers to Pro-Environmental Behavior. Pro-environmental behavior refers to any activities and practices by consumers undertaken to reduce their

environmental impact (Solekah et al., 2024). One sub-topic of green consumer behavior is how the community as consumers utilizes eco-friendly products for their daily needs. A study by Liobikienė and Poškus (2019) reveals that consumers' experience influences green consumer behavior in utilizing environmental products. Each consumer has their own trust in the products, which is determined and evaluated by the perceived effect of the products on the environment. Consumer's sense of responsibility is more likely to influence their intention to buy and use sustainable products (Duarte et al., 2024).

Moreover, the green consumer behavior in this study also refers to the Norm Activation Theory. Norm Activation Theory posits that personal pro-environmental behavior depends on its impact on oneself, others, and the biosphere (Garling et al., 2003). The green consumer behavior in this study refers to the studies of Kaufmann et al. (2012) and Li et al. (2020), which have been modified to suit the needs of this research. There are four indicators, namely (1) Altruism indicator, related to individual pro-environmental behavior as a sense of responsibility for the impact of activities on other individuals; (2) Environmental awareness indicator, showing individual awareness regarding the impact of activities on the environment; (3) Environmental concern and attitude indicator, showing how individual concern influences their attitude towards the environment; and (4) Product information safety indicator, showing that product information can encourage environmentally friendly consumption (Kaufmann et al., 2012; Li et al., 2020).

Additionally, the factor indicators to be analyzed refer to the study of Nguyen et al. (2023), which has been modified to suit this study. There are five indicators: awareness of environmental protection, health awareness, sense of responsibility, expectations when using non-disposable bags, and environmentally friendly marketing or green marketing (Nguyen et al., 2023).

2.2 Eco-friendly Shopping Bag

Reducing the usage of plastic bags will lead to resources and environmental protection (Ari & Yilmaz, 2017). Alternative options that can be used to reduce plastic bag usage in daily activities are reusable Polypropylene (PP) bags and paper bags. Moreover, in coordination with the modern market, the government can implement a tax on plastic bag usage. According to the Singapore Environment Council (SEC) (2018), eco-friendly bags generally require energy and generate higher lifecycle emissions than plastic bags. However, in the long term, plastic bags emitted into the environment will cause a worse environmental impact. The eco-friendly bag has a characteristic where its global warming potential will approach that of plastic bags if it is reused (SEC, 2018). A study by Pratiwi et al. (2024) emphasized that the key advantages of paper bag usage are its compostable characteristics and relatively low environmental damage from burning. The key advantage of reusable PP bags is that they help reduce the amount of plastic waste, as they are reusable.

2.3 Relationship between Environmental Protection Awareness and Green Consumer Behavior

Environmental protection awareness, or awareness of protecting the environment regarding the use of single-use plastic bags, positively influences people's green consumer behavior, encouraging them to use alternatives to single-use plastic bags. Environmental awareness has directly and indirectly affected green consumption in terms of the willingness for green consumption (Liang et al., 2024). This suggests that environmental awareness indirectly shapes attitudes, subjective norms, and perceived behavioral control related to implementing green consumption. Moreover, Ogiemwonyi et al. (2020) reveal that environmental awareness affects consumer behavior derived from knowledge

and recognition of environmental problems. A study by Ari and Yilmaz (2017) shows that increasing awareness of protecting the environment aligns with increasing individual intensity in using reusable shopping bags or “goodie bags” instead of plastic bags. When individuals use shopping bags or other alternatives to plastic bags, their awareness of the environment increases, and their tendency to use environmentally friendly products also increases (Nguyen et al., 2023).

H1: Environmental protection awareness positively influences green consumer behavior.

2.4 Relationship between Health Protection Awareness and Green Consumer Behavior

Health protection awareness, or awareness of maintaining health, positively influences society's green consumer behavior. Consuming and utilizing goods that promote health and environmental benefits can lead to a transformation of human behavior (Ogiemwonyi, 2022). According to Xu et al. (2020), awareness of maintaining health is considered in everyday life. Research conducted by Nguyen et al. (2020) shows that an individual's attitude toward purchasing an environmentally friendly product is positively influenced by their awareness of maintaining health. Like environmental awareness, health awareness also affects purchasing intention and shapes attitudes, subjective norms, and perceived behavioral control (Liang et al., 2024).

H2: Health protection awareness positively influences green consumer behavior.

2.5 Relationship between Sense of Responsibility and Green Consumer Behavior

A sense of responsibility positively influences society's green consumer behavior. The literature review for the study by Le et al. (2023) emphasizes that related to the Norm Activation Model, normative behavior by individuals is shaped by their sense of responsibility. In contrast, self-identity related to social and ecological representation is reflected in self-awareness and a sense of responsibility. According to the literature review by Nguyen et al. (2023), individuals with a sense of responsibility towards the environment will buy and use environmentally friendly products and influence those around them to do the same. Similar to the study by Punzo et al. (2019), the experience of a sense of responsibility towards the environment will lead to implementing pro-environmental behavior. Additionally, Xu et al. (2020) stated that the existence of moral responsibility related to protecting the environment provides positive encouragement for individuals to act to protect the environment.

H3: Sense of responsibility positively influences green consumer behavior.

2.6 Relationship between Expectations when Using Non-single-use Plastic and Green Consumer Behavior

Expectations when using non-single-use plastic, or individual expectations when using alternative products to single-use plastic bags, positively affect people's green consumer behavior. According to the literature review for a study by Nhu et al. (2019), expectations are related to consumer trust, defined as an individual's expectation of a product. The literature review for a study by Mezger et al. (2020) emphasizes that consumer willingness to depend on a product is based on expectations regarding its environmental performance. In order to build consumer trust, the environmental benefits and environmental protection of green products should be communicated to encourage green purchase implementation (Nguyen et al., 2023). Individuals can have expectations based on their trust regarding what will happen in the future when implementing green

consumer behavior by using environmentally friendly products. Individual expectations regarding the use of a product can increase individual knowledge about the product and positively influence environmentally friendly behavior, providing satisfaction in using the product (Kim & Lennon, 2008; Krishnamurthy & Kumar, 2015).

H4: Expectation when using non-single-use plastic positively influences green consumer behavior.

2.7 Relationship between Green Marketing and Green Consumer Behavior

Green marketing, or the marketing of environmentally friendly products, positively affects people's green consumer behavior. To drive positive consumer behavior, green marketing materials are essential in successful green marketing strategies (Grazzini et al., 2018). According to Iqbal et al. (2023), green marketing techniques such as advertising, environmentally friendly packaging, and products made from environmentally friendly materials positively influence the intention to purchase and use environmentally friendly products. Several specific green marketing mechanisms that significantly affect green consumer behavior were also discussed in the study by Chang et al. (2019), such as cash discount incentives and marketing of environmental protection alternatives.

H5: Green marketing positively influences green consumer behavior.

3. Conceptual Framework

Based on the empirical studies reviewed, it is hypothesized that environmental protection awareness, health protection awareness, sense of responsibility, consumer expectations, and green marketing will affect green consumer behavior. The conceptual framework illustrating the relationship between these variables influencing green consumer behavior is shown in the Figure 1.

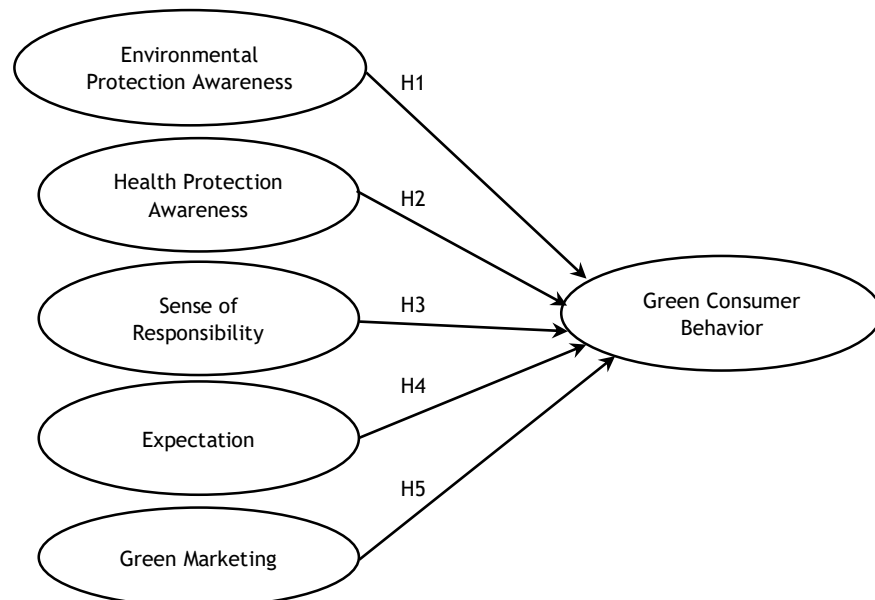


Figure 1. Conceptual framework of the factors influencing green consumer behavior

This study's hypotheses are listed below:

- H1: Environmental protection awareness positively influences green consumer behavior
- H2: Health protection awareness positively influences green consumer behavior
- H3: Sense of responsibility positively influences green consumer behavior
- H4: Expectations when using non-single-use plastic positively influence green consumer behavior
- H5: Green marketing positively influences green consumer behavior

4. Methods

4.1 Research Design

The study employed a cross-sectional study, where the data were collected from different individuals simultaneously, using a quantitative analysis method to estimate complex relationships among multiple dependent and independent variables relevant to the topic. The study was conducted in South Tangerang City, Banten Province, Indonesia. This location was chosen purposively because South Tangerang City has a plastic waste problem, particularly from single-use plastic bags. Moreover, the South Tangerang City Government recently released a new policy on minimizing plastic bag usage.

4.2 Sampling

The study used primary data from interviews with respondents using a questionnaire distributed online to 115 people. The sampling method used for this study is non-probability sampling with a convenience sampling technique, where the respondents are limited to the residents of South Tangerang City who shop for daily necessities in modern retail stores. The number of respondents sampled refers to Hair et al. (2019), where the ideal number of respondents is between 100 and 200. The required number of respondents for this study was calculated using a 5:1 sample-to-variable ratio, as Hair et al. (2019) recommended, which resulted in 115 respondents meeting the requirements.

$$((\text{number of indicators} + \text{number of latent variables})) \times 5 = (23 + 1) \times 5 = 115$$

4.3 Measurement

Table 1 shows the indicators of green consumer behavior used for analysis in this study. Two variables are assessed: perceived green consumer behavior and factors influencing green consumer behavior implementation.

Table 1. Indicators of perceived green consumer behavior and factors influencing green consumer behavior

Variables	Operational Definition	Indicators	Scale
Green consumer behavior (Kauffman et al., 2012)	The implementing the green consumer behavior, including: 1) Altruism (GCB 1) 2) Environmental awareness (GCB 2) 3) Environmental concern and attitude (GCB 3)	1) Do not/reduce/stop using single-use plastic bags to protect future generations from the bad effects of plastic bag waste (GCB 1) 2) Do not/reduce/stop using single-use plastic bags because their use can increase the amount of plastic waste in the environment (GCB 2)	Likert scale: Strongly disagree (1) to strongly agree (4)

Table 1. Indicators of perceived green consumer behavior and factors influencing green consumer behavior (Continue)

Variables	Operational Definition	Indicators	Scale
Perceived green consumer behavior (Kauffman et al., 2012)	4) Product information that safety to use (GCB 4)	3) Separate organic and non-organic waste and recycle it (GCB 3) 4) Use products that can be used repeatedly because they are safe for health (GCB 4)	Likert scale: Strongly disagree (1) to strongly agree (4)
Factors influencing green consumer behavior (Nguyen et al., 2023)	Factors that influencing the green consumer behavior of shopping bags consumer, including: 1) Environmental protection awareness (EPA) 2) Health protection awareness (HPA) 3) Sense of responsibility (SOR) 4) Expectation (EXP) 5) Green marketing (GMK)	1) Poor air quality due to burning of plastic waste (EPA 1) 2) Marine ecosystem damage (EPA 2) 3) Water pollution (EPA 3) 4) Flood due to plastic waste (EPA 4) 5) Impact on animal survival (EPA 5) 6) Digestive and respiratory diseases (HPO 1) 7) Problems with reproduction (HPO 2) 8) Problems with child development (HPO 3) 9) Carry out waste separation and collection (SOR 1) 10) Recycle plastic (SOR 2) 11) Limit the use of single-use bags (SOR 3) 12) Use environmentally friendly products (SOR 4) 13) Clean air (EXP 1) 14) Clean water source (EXP 2) 15) Changes in the entire ecosystem for the better (EXP 3) 16) Animals and plants are protected (EXP 4) 17) Regulations and laws related to environmental protection (EXP 5) 18) Encourage consumers to protect the environment (GMK 1) 19) A product that is comfortable to use (GMK 2) 20) An affordable price (GMK 3) 21) Good quality of goods (GMK 4) 22) Safe for humans and animals (GMK 5) 23) Environmentally friendly product life cycle (GMK 6)	Likert scale: Strongly disagree (1) to strongly agree (4)

4.4 Data Collection

This study used primary data, which are processed quantitatively and qualitatively. The primary data collection for this study was conducted using an online questionnaire distributed to qualified potential respondents in South Tangerang City. Data was collected using Google Forms. To ensure the representation of each sub-district in South Tangerang City, the distribution of the data used for analysis is based on a percentage of the population in each sub-district.

4.5 Data Analysis

This study of factors related to green consumer behavior applied descriptive analysis as the primary data analysis technique. The method used is a 4-point Likert scale, with response options ranging from “strongly disagree” to “strongly agree.” Hypothesis testing is conducted using structural equation modeling (SEM). SEM is suitable for studying a system's behavioral process. The advantage of SEM is that it can reject individual models based on the level of similarity between the observed and model-implied covariance matrices using the chi-square test.

5. Findings

5.1 Respondents Characteristics

As shown in Table 2, respondents of this study primarily lived in Pondok Aren and Pamulang Sub-District, which is a sub-district with most populations in South Tangerang City based on the Bureau of Statistics of South Tangerang City (2022). Female respondents dominated this study (59%). Females commonly buy a daily need more than males. Private sector employees dominate (40%) as South Tangerang City is an urban area adjacent to Jakarta, the capital city. Most of the respondents' shopping frequency per month is 1 to 4 times. Based on the overall data on respondents' monthly shopping frequency, it was concluded that the average frequency of people in South Tangerang City shopping in one month is 3 times.

Table 2. Respondent socio-demographic characteristics

Variables	Percentage (%)
Sex	
Female	59
Male	41
Domicile	
Pondok Aren	29
Pamulang	28
Ciputat	13
Serpong	11
Setu	10
Ciputat Timur	6
Serpong Utara	3
Education	
Elementary School	1
Junior High School	0
Senior High School	13
Diploma	6
Bachelor	75
Master	6
PhD	0

Table 2. Respondent socio-demographic characteristics (Continue)

Variables	Percentage (%)
Occupation	
Private sector employee	40
Self-employed	20
Government employee	1
Teacher	1
Student	13
Housewife	7
Other	18
Household Expenditure	
IDR 300,000 - 1,000,000	17
IDR 1,000,001 - 1,500,000	5
IDR1,500,001 - 10,000,000	63
>IDR 10,000,000	15
Shopping Frequency in a Month	
1 - 4 times	87
5 - 8 times	9
9 - 12 times	2
13 - 16 times	2

5.2 Green Consumer Behavior

The indicators of green consumer behavior in this study refer to the studies of Kauffman et al. (2012) and Li et al. (2020), which include altruism, environmental awareness, environmental concern and attitude, and product information safety. Table 3 presents the analysis of these indicators of green consumer behavior.

Table 3. Results of green consumer behavior analysis

Indicators	1*	2*	3*	4*	Total***	Category
Altruism	5	7	40	63	115	
Sub-total**	5	14	120	252	391	Strongly Agree
Environmental awareness	6	8	32	69	115	
Sub-total**	6	16	96	276	394	Strongly Agree
Environmental concerns and attitude	2	25	47	41	115	
Sub-total**	2	50	141	164	357	Agree
Product information that safety to use	0	7	52	56	115	
Sub-total**	0	14	156	224	394	Strongly Agree

Note: *Likert Scale weight; **The result of multiplying the weight of the Likert scale score by the number of respondents who voted; ***In correlation with (**), strongly agree category refer to >373.5 in result and agree category refer to >287.5 - 373.75 in result.

Table 3 shows that altruism, environmental awareness, and product information safe to use are strongly agreed by the respondents those indicators associated with green consumer behavior. Indicators related to environmental concern and attitude have a total weight of 357, and respondents agree that environmental concern and attitude statements are associated with green consumer behavior.

5.3 Driving Factors of Green Consumer Behavior

The Likert scale results representing the values of each variable on perceived green consumer behavior were processed using structural equation modelling (SEM) to obtain the SEM diagram path. The results of the first SEM processing can be seen in the Figure 2.

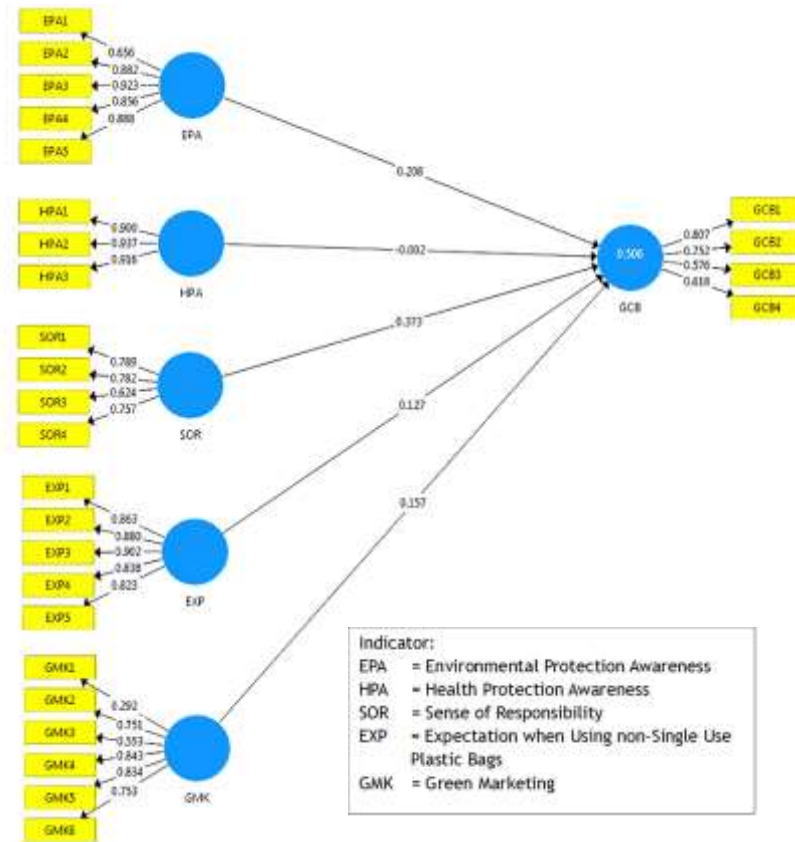


Figure 2. Diagram of first processing SEM results

Figure 2 shows the initial SEM processing results, including the loading factor values for each variable and indicator. The loading factor obtained determines whether the indicators used meet the SEM requirements. Furthermore, these results can be analyzed to obtain results. The first analysis to obtain the result of the SEM is validity analysis with convergent validity. This analysis requires that the loading factor value be more than 0.70 to meet the SEM requirement. Figure 2 shows that the indicators EPA1, SOR3, GMK1, GMK3, GCB3, and GCB4 have a loading factor value of less than 0.70, so these indicators are considered not to meet the SEM requirements and can be removed from the model. Hair et al. (2021) emphasized that the removal of the indicator for the following SEM processing will only be considered if the convergent validity value is increased and meets the threshold of the rule of thumb, which is indicator loadings of more than 0.708, Cronbach's alpha more than 0.7, and AVE more than 0.5.

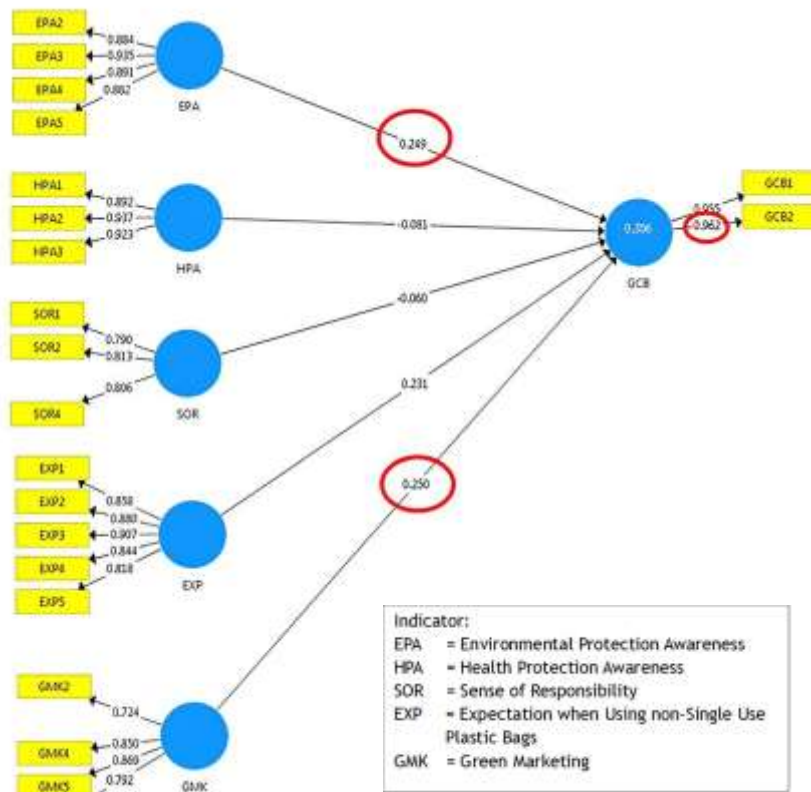


Figure 3. Diagram of second processing SEM results

A second SEM processing should be conducted to ensure that the indicators left meet the SEM requirements. The second process used a convergent validity result, as shown in Figure 3. This shows that all other indicators of EPA, HPA, SOR, EXP, GMK, and GCB have a loading factor value of more than 0.70, so all indicators meet the SEM requirement.

The subsequent analysis to strengthen the results of SEM-PLS is a reliability test using Cronbach's Alpha. In this analysis, Cronbach's Alpha value for each variable has the condition that it is more than 0.70. The results of the reliability test can be seen in Table 4.

Table 4. Cronbach's alpha value of green consumer behavior

Variable	Cronbach's Alpha (>0.7)
Environmental Protection Awareness (EPA)	0.920
Expectations when using non-single-use plastic bags (EXP)	0.913
Green Consumer Behavior (GCB)	0.911
Green Marketing (GMK)	0.826
Health Protection Awareness (HPA)	0.907
Sense of Responsibility (SOR)	0.744

The reliability testing results in Table 4 show that all variables have a Cronbach's Alpha value that exceeds 0.70. This shows that all these variables are considered reliable test variables in this research. All the variables considered reliable will be further analyzed using discriminant validity testing. Validity testing can be done by looking at the AVE value of each variable. Discriminant validity meets the requirements and is considered good if the AVE exceeds 0.50. The AVE value for each variable from this research can be seen in Table 5. Table 5 shows that all variables have an AVE value exceeding 0.50. These

results show that all variables meet the requirements for discriminant validity and have been determined to be valid variables.

Table 5. AVE of the green consumer behavior variables

Variables	Average Variance Extracted (AVE) (>0.5)
Environmental protection awareness (EPA)	0.807
Expectation when using non-single-use plastic bags (EXP)	0.743
Green consumer behavior (GCB)	0.918
Green marketing (GMK)	0.658
Health Protection Awareness (HPA)	0.842
Sense of responsibility (SOR)	0.645

In order to analyze the hypothesis of this study, hypothesis testing was conducted using the p-values. Moreover, the hypothesis will be supported by the result of the beta coefficient values. Hypothesis testing regarding the relationship between independent latent variables and dependent latent variables and their indicators can be seen in Table 6. Hypothesis testing in this study uses p-values with the condition exceeding 0.05, which are considered to support the hypothesis of this study.

Table 6. P-values and beta values of factors influencing green consumer behavior

Variables	Beta coefficient values	P-values
Environmental Protection Awareness (EPA)	0.249	0.025*
Expectations when using non-single-use plastic bags (EXP)	0.231	0.140
Green marketing (GMK)	0.250	0.042*
Health Protection Awareness (HPA)	-0.081	0.347
Sense of responsibility (SOR)	-0.050	0.582

Note: * significant at $p < 0.05$

Table 6 shows the p-value for the relationship between the latent variable of environmental protection awareness and green consumer behavior is 0.025, less than 0.05. These results support H1, which means that environmental protection awareness significantly influences green consumer behavior. Beta values of the environmental protection awareness (0.249) indicate that environmental protection positively affects green consumer behavior. The p-value for the relationship between the latent variable of health protection awareness and green consumer behavior is 0.347, which is less than 0.05. The results of the p-values do not support H2, which means that health protection awareness does not influence green consumer behavior. It is also supported by the beta values of health protection awareness (-0.081), which indicates that health protection awareness has a negative effect on green consumer behavior. The p-value for the relationship between the latent variable sense of responsibility and green consumer behavior is 0.582, which is less than 0.05. These results do not support the H3, meaning that a sense of responsibility does not influence green consumer behavior. This result is supported by the beta values of sense of responsibility (-0.050), which indicates that sense of responsibility has a negative effect on green consumer behavior.

The p-value for the relationship between the latent variable expectation when using non-single-use plastic bags and green consumer behavior is 0.140, less than 0.05. Despite having a positive beta value (0.231), based on the p-value results, it does not support the H4, which means that expectations when using non-single-use plastic bags do not influence green consumer behavior. Last, the p-value for the relationship between the latent variable green marketing and green consumer behavior is 0.042, less than 0.05. These results support the H5, meaning green marketing influences consumer behavior. This result is supported by the beta values of green marketing (0.250), which indicates that green marketing has a positive significant effect on green consumer behavior. The green marketing shows the largest and most positive beta value among other variables.

6. Discussion

6.1 Green Consumer Behavior

The analysis of indicators shows that respondents in this study strongly agree that avoiding, reducing, or stopping the use of single-use plastic bags can protect future generations from the negative impacts of plastic waste (altruism) and reduce plastic waste in the environment (environmental awareness). This aligns with the Norm Activation Theory, where altruistic behavior depends on the awareness of others (Garling et al., 2003). In addition, respondents also agreed that using environmentally friendly products is safe for one's health. This finding matches studies by Li et al. (2020) and Steg et al. (2014), showing that individuals concerned about the environment's future or with high altruism are more likely to use environmentally friendly products for the greater good. Altruism is influenced by two factors: psychological altruism, which shows the motivation of individual concern for the welfare of others, and biosphere altruism, which shows individual concern for the survival of living creatures other than humans around them (Vlerick, 2021).

The respondents' positive attitude and concern about environmental impact strongly affect green consumer behavior, as evidenced by studies from Ramadhanti et al. (2024), which reveal that environmental attitude significantly affects the consumers' green purchase intention. Likewise, a study by Alberto and Riza (2023) emphasizes that environmental concern has a positive relationship with consumer attitude. Those sensitive to environmental issues will most likely participate actively in green programs. However, environmental attitude and concern have scored lowest among other indicator related to green consumer behavior implementation. This may indicate the key factors driving consumers in the study area to implement green behavior, as attitudes reflect purchasing intentions, social responsibility, and personal health concerns (Liang et al., 2024).

Apart from attitude and concern for the environment, this study also shows that individual trust in environmentally friendly products influences their usage. According to Sharma (2021), belief in environmentally friendly products can encourage individual willingness and loyalty as eco-conscious customers. Marketing strategies that increase consumer confidence in green products may effectively boost awareness of a product's environmental impact. Other research studies show that concern for the environment drives purchase intention toward products that are more environmentally friendly and safer to consume (Alberto & Riza, 2023; Zulfa et al., 2023).

Regarding product information, respondents strongly agreed that using products safe for repeated use better ensures health. Solekah et al. (2024) revealed that consumer knowledge of environmentally friendly products impacts eco-friendly attitudes. Similarly, Ahmad and Juhdi (2010) found that trust in reusable products can influence

individual green behavior. Fadliyah et al. (2021) also noted a significant relationship between trust in product advertising and consumer behavior. The availability of information about environmentally friendly options significantly encourages eco-friendly actions (Ismail & Panni, 2008).

Respondents demonstrated positive environmental awareness, understanding that single-use plastics can increase difficult-to-decompose waste in the environment. Xu et al. (2022) found that higher public awareness of environmental problems like plastic waste correlates with more positive perceptions of regulations on these items. This awareness could encourage switching to eco-friendly shopping bags, as Li et al. (2020) found that environmental awareness can motivate the adoption of greener products. However, Solekah et al. (2024) contradictorily found that plastic bag awareness does not directly impact consumers' willingness to use alternative shopping bag materials.

6.2 Effect of Environmental Protection Awareness on Green Consumer Behavior

This study found environmental awareness to be a significant factor affecting consumers' willingness to implement green consumer behavior in eco-friendly shopping bags. This result aligns with existing research, like Liang et al.'s (2024) finding that environmental awareness affects the consumers' intention to purchase green products. Environmental awareness will increase consumers' motivation to purchase green products (Ogiemwonyi, 2024). This is also supported by the study of Nguyen et al. (2023), where individuals will implement environmentally friendly behavior if awareness of protecting the environment increases, where individuals are aware of the impact of single-use plastic bag waste on the environment so that individuals will tend to reduce the use of single-use plastic bags.

In addition, according to Arı and Yılmaz (2017), individuals who are aware of the impact of single-use plastic bag waste on the environment will try to reduce plastic bag use. This awareness will shape consumers; intention toward sustainable consumption (Brandão & da Costa, 2021). Moreover, Joshi and Rahman (2015) emphasized that environmental consciousness is the psychological factor of green purchasing behavior. Consumers lacking environmental consciousness will have less intention to buy green products. As found by Xu et al. (2020), environmental awareness or consciousness has an indirect effect on purchase intention via perceived behavioral control; it is noted that the direct link analysis reveals that environmental consciousness has an insignificant effect on green product purchase intentions.

6.3 Effect of Health Protection Awareness on Green Consumer Behavior

Surprisingly, the relationship between health protection awareness and green consumer behavior resulted in insignificance where health protection awareness does not affect the implementation of green consumer behavior. This study's result is different from other studies. The difference in the result may be due to the indirect and long-term effects of plastic bag waste on the environment and human physical health. However, a literature review of a study by Nguyen et al. (2023) reveals that several studies ignore the impact of health awareness on consumer behaviors. While specific to the intention of purchasing green products, a study by Aseri and Ansari (2023) showed that health consciousness has no significant relationship with green purchase intention. Moreover, Liang et al. (2024) revealed that attitude reflects consumers' concern for personal health. As revealed in the result of green consumer behavior, this study found that in South Tangerang City, environmental attitude and concern on green consumer behavior has the lowest score.

6.4 Effect of Sense of Responsibility on Green Consumer Behavior

Compared to other studies, a sense of responsibility was also found insignificant for green consumer behavior. Alam et al. (2023) emphasized that responsibility does not directly impact green consumer behaviors. It suggests that the environmental attitude should be raised to incline green consumer behavior to a sense of responsibility. This aligns with this study's findings on low environmental attitudes and concerns. Responsibility may require consumers to incorporate environmental and natural values into their self-concepts (Wang et al., 2021). The divergent result here may stem from Indonesia's relatively new plastic bag ban, so responsibility and green attitudes are still in the formation stage. Moreover, according to the Bureau of Statistics of Indonesia (2022), the percentage of waste sorting and recycling rates by the community in Indonesia remains low (19.49% & 0.39%).

6.5 Effect of Expectations when Using Non-single-use Plastic Bags on Green Consumer Behavior

Consumers' expectations for non-single-use plastic bags also proved insignificant for green consumer behaviors, supporting some existing research. Nguyen et al. (2023) found that expectations do not influence customer behaviors, specifically on plastic products. However, it is noted that consumers' expectations are generated by their trust in the products. In a study by Gano-an (2018), consumers expect a non-harmful environmental impact by using an eco-friendly product, and the usage is expected to be inclined. Moreover, according to Chang and Chou (2018), consumers will likely engage with sustainable products where there is no environmental disruption as their expectation. Related to the result, green product information is expected to increase the intention of consumers to implement green consumer behavior indirectly by gaining expectations of non-single-use plastic bags or eco-friendly bags.

6.6 Effect of Green Marketing on Green Consumer Behavior

Green marketing has been proven to significantly influence the implementation of green consumer behavior. This analysis's results align with those of Sharma (2021) and Ansar (2013), who show that advertising or marketing environmentally friendly products will influence people's shopping interest in environmentally friendly products. A study by Fadliyah et al. (2021) emphasizes that the fact that advertising is quite informative and convincing can explain why there is a significant relationship between consumer trust in the truth of advertising and consumer behavior towards branded products. Apart from that, the price of environmentally friendly products also influences interest in shopping for environmentally friendly products. A study by Zarei and Mirzaei (2022) stated that purchase behavior is based on the evaluation of the costs and benefits of the consumer. The driving factor of environmental protection awareness is individuals' awareness of caring for the environment, which is also related to the green marketing of environmentally friendly products. Consumers will have an interest in consuming environmentally friendly products even at high prices (Ansar, 2013).

6.7 Theoretical Implication

This study contributes to filling the existing research gap on green consumer behavior implementation in using eco-friendly bags, especially in South Tangerang City Indonesia. This study proved that environmental protection awareness and green marketing have a significant influence on green consumer behavior, aligned with the study by Nguyen et al. (2021), Ogiemwonyi et al. (2023), and Liang et al. (2024). Moreover, this study also strengthens the previous study, where the expectation of consumers has an insignificant

influence on green consumer behavior. It is important to note that consumers' trust is associated with their expectations.

However, this study has a different result from other studies, where health protection awareness and a sense of responsibility have insignificant influence on green consumer behavior in South Tangerang City. This result emerged because people still prioritize price in using shopping bags and their practicality. This result provides new evidence of differences in factors influencing consumers' behavior at different study locations. Moreover, as Indonesia is a developing country, this study contributes to analyzing green consumer behavior in developing countries.

6.8 Managerial Implication

This study proves that environmental protection awareness and green marketing influence green consumer behavior in using eco-friendly bags in South Tangerang City, Indonesia. Green marketers and policymakers can use this result to broadly design effective programs and strategies to encourage and increase the utilization of eco-friendly bags in South Tangerang City. It is vital to both green marketers and policymakers to convey to the public the importance of green consumer behavior in daily activities. Gaining public awareness can be accompanied by information and knowledge and inviting the community to implement more environmentally friendly behavior. Environmental protection awareness and green marketing can be implemented in parallel by advertising, price, or incentives. Ogiemwongi et al. (2023) suggest that promoting environmental information as a practical tool will enhance green consumer behavior and potentially reduce the environmental impact. Moreover, the policymakers can encourage green businesses and other retailers to commit to cooperating, reducing environmental impact, and creating a sustainable community consumer. This study contributes to having a better initial understanding of green consumer behavior in South Tangerang City, considering that the regulation on plastic bag waste is relatively new. It is essential to have a monitoring program on the existing regulation to better understand the changes in citizenship behavior on green consumer behavior, specifically on the usage of eco-friendly bags as an alternative to single-use plastic bags.

This study shows that health protection awareness, a sense of responsibility, and expectations when using non-single-use plastic bags do not significantly affect green consumer behavior in using eco-friendly shopping bags. However, as previous studies (Mezger et al., 2020; Nguyen et al., 2020; Punzo et al., 2019) emphasized that consumers' health protection awareness, sense of responsibility, and expectations when using non-single-use plastic bags are other factors that form consumers' green consumer behaviors. Therefore, in the future, governments also recommended considering health awareness, a sense of responsibility, and consumers' expectations in relation to eco-friendly bag usage to improve the green consumption behavior of the consumers in South Tangerang City.

6.9 Limitations

This study has several limitations in examining green consumer behavior. It only samples consumers in retail moderns, considering the existing regulation is limited to the retail modern market. Moreover, this study did not consider a specific respondent from a vulnerable community. The ease of using shopping bags certainly impacts vulnerable communities.

7. Conclusions

Eco-friendly behaviors can protect future generations from plastic bag impacts and reduce environmental plastic waste. They believe sorting waste and reusing products demonstrates an environmentally caring attitude, which, according to the community, can mitigate environmental plastic waste, especially in their city.

This study found that consumer awareness of environmental protection and green marketing impact on green consumer behavior. Aligned with pro-environmental behavior theory, heightened environmental awareness driven by green marketing strengthens green consumption behaviors. This can encourage people to use eco-friendly shopping bags to comply with South Tangerang Mayor Regulation No. 83 of 2022 concerning plastic waste reduction.

8. Recommendation

Due to limitations, this study recommends exploring correlations between demographics and green consumer behaviors. Incorporating vulnerable consumer samples could provide richer insights to help marketers and policymakers. Additionally, more research on green consumer behaviors is needed as South Tangerang's plastic bag regulations are still new. Expanding the subject pool beyond modern retail consumers into traditional markets could yield a better and broader understanding of green consumer behavior in using eco-friendly bags for all consumers in South Tangerang City.

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