



PSYCHOLOGICAL FACTORS INFLUENCING SUSTAINABLE CONSUMPTION BEHAVIOR AMONG STUDENTS AT VAN XUAN HIGH SCHOOL, HANOI

Pham Thi Kiem

Faculty of Management,
School of Economics,
Hanoi University of Industry
Email: kiem.sp@gmail.com

Corresponding Author: Pham Thi Kiem

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Abstract

Sustainable consumption behavior among high school students plays a significant role in fostering environmentally and socially responsible lifestyles. This study aims to identify and analyze the influence of selected psychological factors on the sustainable consumption behavior of students at Van Xuan High School, Hanoi. Based on an extended Theory of Planned Behavior (TPB), the proposed research model examines the roles of environmental awareness, environmental concern, sustainable consumption knowledge, subjective norms, green trust, attitudes toward sustainable consumption, and sustainable consumption intention in shaping sustainable consumption behavior. A quantitative research approach was employed using a structured questionnaire administered to students at Van Xuan High School. Statistical analyses were conducted to assess the reliability and validity of the measurement scales, examine the relationships among variables, and evaluate the effects of the proposed factors within the research model. The findings reveal that cognitive factors, attitudes, social influences, and behavioral intentions play significant roles in shaping sustainable consumption behavior among high school students. Based on these findings, several implications are proposed for environmental education and the development of psychosocial educational programs aimed at promoting sustainable consumption behavior in high schools.

Keywords: sustainable consumption behavior; psychological factors; environmental awareness; attitude; behavioral intention; high school students.

1. Introduction

Against the backdrop of accelerating climate change, environmental pollution, and the depletion of natural resources, sustainable consumption has become one of the key solutions for achieving sustainable development. According to the United Nations Environment Programme (UNEP, 2023), sustainable consumption refers to the use of goods and services that meet basic human needs and improve quality of life while minimizing the use of natural resources, waste generation, and adverse environmental impacts throughout the product life cycle, without compromising the ability of future generations to meet their own needs. This perspective is consistent with Sustainable Development Goal 12 (SDG 12) of the United Nations, which emphasizes ensuring sustainable consumption and production patterns (United Nations, 2015). Therefore, in addition to governmental policies and business initiatives, encouraging changes in individual consumption behavior - particularly among younger generations - is essential for advancing sustainable development.

High school students represent a critical population in the process of developing personal values, attitudes, and consumption habits. At this stage of life, they are strongly influenced by family, school,

peers, and the media. Consequently, their consumption decisions not only reflect their current perceptions but also contribute to shaping their future lifestyles and behavioral patterns. Investigating the psychological factors that influence sustainable consumption behavior among high school students is therefore important from both theoretical and practical perspectives, providing a scientific basis for designing educational programs that foster sustainable lifestyles from an early age.

Previous studies have demonstrated that sustainable consumption behavior is simultaneously influenced by various psychological factors, including environmental awareness, environmental knowledge, environmental concern, green trust, attitudes, subjective norms, perceived behavioral control, and behavioral intention (Joshi & Rahman, 2015; Nguyen et al., 2019). Among the theoretical frameworks used to explain such behavior, the Theory of Planned Behavior (TPB) proposed by Ajzen (1991) is regarded as one of the most influential. According to TPB, behavioral intention is the most immediate determinant of actual behavior, while intention itself is influenced by three core components: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). Building upon this framework, many researchers have extended TPB by incorporating additional variables such as environmental knowledge, environmental awareness, and green trust to improve its explanatory power in different contexts of sustainable and green consumption (Paul et al., 2016; Yadav & Pathak, 2017).

In Vietnam, studies on sustainable consumption have mainly focused on adult consumers or university students, whereas empirical evidence regarding high school students remains relatively limited. Furthermore, only a few studies have simultaneously integrated multiple psychological factors into an extended TPB framework to explain sustainable consumption behavior among secondary school students. This research gap highlights the need for more comprehensive investigations into the psychological mechanisms underlying sustainable consumption behavior during adolescence.

To address this gap, the present study examines the psychological factors influencing sustainable consumption behavior among students at Van Xuan High School, Hanoi, by applying and extending the Theory of Planned Behavior. The findings are expected not only to enrich the empirical evidence concerning the psychological determinants of sustainable consumption behavior among Vietnamese high school students but also to provide scientific support for developing school-based psychological education programs and education for sustainable development in secondary education.

2. Theoretical Background and Research Framework

2.1. Theoretical Background

Sustainable Consumption Behavior

Sustainable consumption refers to the selection, use, and disposal of products in ways that minimize negative environmental impacts while contributing to the well-being of both individuals and society (Organisation for Economic Co-operation and Development [OECD], 2002; United Nations Environment Programme [UNEP], 2015). Sustainable consumption behavior encompasses activities such as purchasing environmentally friendly products, conserving energy, reducing the use of single-use plastics, reusing and recycling materials, and considering social and ethical issues during purchasing decisions (OECD, 2002; United Nations, 2015).

Among high school students, sustainable consumption behavior is reflected in daily practices such as carrying reusable water bottles, using cloth bags instead of plastic bags, sorting waste, reducing food waste, conserving electricity and water, and choosing environmentally friendly products whenever possible (UNEP, 2015; UNESCO, 2020).

Psychological Factors Influencing Sustainable Consumption Behavior

Environmental Awareness: Environmental awareness refers to an individual's understanding of environmental issues, including the causes and consequences of environmental pollution and the impacts of human consumption on ecosystems. It enables individuals to recognize the relationship between their consumption behavior and sustainable development. Consumers with higher levels of environmental awareness are more likely to consider environmental consequences when making purchasing decisions. Kollmuss and Agyeman (2002) identified environmental awareness as one of the key antecedents of pro-environmental behavior. Likewise, Bamberg and Möser (2007) concluded that environmental awareness positively influences individuals' environmental attitudes and behaviors.

Environmental Concern: Environmental concern reflects the degree to which individuals care about environmental problems and feel responsible for protecting the environment. It represents an intrinsic motivation that encourages individuals to transform environmental awareness into concrete actions aimed at reducing environmental degradation. Consumers with higher environmental concern are

generally more willing to modify their consumption habits, choose environmentally friendly products, and participate in environmental protection activities. Dunlap et al. (2000) argued that environmental concern reflects individuals' ecological value orientation and plays an important role in shaping environmentally responsible behavior. Similarly, Bamberg and Möser (2007) confirmed that environmental concern positively influences both attitudes toward environmental protection and intentions to engage in sustainable consumption.

Sustainable Consumption Knowledge: Sustainable consumption knowledge refers to an individual's understanding of responsible consumption principles, green products, eco-labels, and the environmental and social consequences of consumption activities. Consumers with greater knowledge are better able to evaluate the quality, value, and environmental benefits of sustainable products, thereby making more informed purchasing decisions. Mostafa (2007) identified environmental and green product knowledge as important drivers of green purchasing behavior. Likewise, Joshi and Rahman (2015), through a comprehensive literature review, concluded that knowledge significantly affects both attitudes toward and intentions to engage in sustainable consumption.

Subjective Norms: According to the Theory of Planned Behavior (TPB), subjective norms refer to individuals' perceptions of social expectations or pressures from significant others, such as parents, teachers, peers, or the broader community, regarding whether they should perform a particular behavior. When individuals believe that people important to them support sustainable consumption, they are more likely to develop stronger intentions to perform such behavior. For high school students, family members, teachers, and peers represent influential social agents shaping both perceptions and consumption behavior. Ajzen (1991) identified subjective norms as one of the three core determinants of behavioral intention, and numerous empirical studies have confirmed its influence on environmentally friendly consumption behavior.

Green Trust: Green trust refers to consumers' confidence in the environmental claims, quality, effectiveness, and credibility of green products. When consumers believe that environmentally friendly products genuinely contribute to environmental protection while satisfying their functional needs, they are more likely to purchase and use such products. Chen (2010) emphasized that green trust is a crucial determinant of green brand equity and green purchasing behavior. Furthermore, Chen and Chang (2013) argued that trust in firms' environmental claims reduces consumer skepticism and enhances purchase intentions toward environmentally friendly products.

Attitude Toward Sustainable Consumption: Attitude toward sustainable consumption represents an individual's positive or negative evaluation of engaging in environmentally responsible consumption behavior. Attitudes are formed based on personal beliefs, knowledge, and experiences regarding the benefits and significance of sustainable consumption. Within the TPB framework, attitude is considered a direct determinant of behavioral intention. Individuals with favorable attitudes toward sustainable consumption are more likely to purchase green products, reduce environmentally harmful consumption, and participate in environmental protection activities. Ajzen (1991) identified attitude as one of the strongest predictors of behavioral intention, while Paul et al. (2016) demonstrated its positive influence on green purchasing intention.

Sustainable Consumption Intention: Sustainable consumption intention reflects an individual's willingness and commitment to perform environmentally responsible consumption behavior in the future. According to TPB, behavioral intention is regarded as the most immediate and powerful predictor of actual behavior. Individuals with stronger intentions are more likely to translate these intentions into actual behavior, provided that no substantial barriers exist. Ajzen (1991) described intention as the bridge connecting psychological determinants with actual behavior. In the context of green consumption, Paul et al. (2016) similarly confirmed that behavioral intention has a direct and positive influence on consumers' decisions to purchase and use environmentally friendly products.

Theory of Planned Behavior: The Theory of Planned Behavior (TPB), developed by Ajzen (1991) as an extension of the Theory of Reasoned Action, proposes that human behavior is directly determined by behavioral intention. Behavioral intention, in turn, is influenced by three fundamental components: attitude toward the behavior, subjective norms, and perceived behavioral control (PBC). Attitude reflects an individual's positive or negative evaluation of performing a behavior, subjective norms represent perceived social pressure, and perceived behavioral control reflects individuals' beliefs regarding their capability and available resources to perform the behavior. Owing to its strong explanatory power, TPB

has been widely applied across various fields, including marketing, health, education, green consumption, and sustainable consumption research (Ajzen, 1991; Armitage & Conner, 2001).

In the present study, the TPB framework is extended by incorporating four additional constructs: environmental awareness, environmental concern, sustainable consumption knowledge, and green trust. These factors are hypothesized to influence attitudes toward sustainable consumption and behavioral intention, which subsequently affect sustainable consumption behavior among high school students.

Unlike the original TPB framework, Perceived Behavioral Control (PBC) is excluded from the proposed model. This decision is based on the characteristics of the research population. High school students generally have limited financial independence and purchasing autonomy, with many consumption decisions remaining under the influence of parents or guardians. Consequently, perceived behavioral control may not accurately reflect their actual ability to engage in sustainable consumption behavior. Although students may possess positive attitudes and strong intentions to consume sustainably, their actual behavior can still be constrained by financial limitations, restricted purchasing authority, and limited availability of green products.

Furthermore, numerous studies on green and sustainable consumption have successfully modified the TPB framework by replacing or supplementing its original constructs with environmental awareness, environmental concern, environmental knowledge, and green trust to improve the model's explanatory power (Joshi & Rahman, 2015; Paul et al., 2016; Yadav & Pathak, 2017). Following this approach, the present study emphasizes cognitive factors, attitudes, social influence, and behavioral intention while maintaining the theoretical foundation of TPB and adapting it to the psychological characteristics of high school students.

2.2. Proposed Research Model

Based on the modified TPB framework and previous empirical studies, this study proposes a research model consisting of seven independent variables: environmental awareness, environmental concern, sustainable consumption knowledge, subjective norms, green trust, attitude toward sustainable consumption, and sustainable consumption intention. The dependent variable is sustainable consumption behavior.

2.3. Research Hypotheses

The research hypotheses were developed based on the Theory of Planned Behavior (TPB) proposed by Ajzen (1991), together with empirical evidence regarding the roles of psychological and environmental factors in green and sustainable consumption behavior. According to TPB, attitude, subjective norms, and perceived behavioral control are the primary determinants of behavioral intention, which subsequently predicts actual behavior (Ajzen, 1991). In addition, previous studies have demonstrated that environmental awareness, environmental concern, sustainable consumption knowledge, and green trust serve as important antecedents of positive attitudes toward sustainable consumption.

Environmental Awareness and Attitude: Environmental awareness reflects an individual's understanding of environmental issues and the consequences of consumption activities for ecosystems. Individuals with higher environmental awareness are more likely to evaluate environmentally friendly consumption positively and develop favorable attitudes toward sustainable consumption. Empirical studies by Bamberg (2003) and Paul et al. (2016) reported that environmental awareness has a significant positive effect on attitudes toward green consumption. H1: Environmental awareness positively influences attitudes toward sustainable consumption.

Environmental Concern and Attitude: Environmental concern represents the degree to which individuals are concerned about pollution, climate change, and the depletion of natural resources. Consumers who demonstrate stronger environmental concern are generally more likely to develop favorable attitudes toward sustainable products and environmentally responsible lifestyles. Previous studies by Chan (2001) and Kumar (2021) confirmed that environmental concern is a significant predictor of positive attitudes toward green consumption. H2: Environmental concern positively influences attitudes toward sustainable consumption.

Sustainable Consumption Knowledge and Attitude: Knowledge of sustainable consumption enables consumers to understand the economic, environmental, and social benefits of purchasing environmentally friendly products. Individuals with greater knowledge are expected to form more favorable attitudes toward sustainable consumption. Amyx et al. (1994) and Mostafa (2007) found that environmental knowledge and green product knowledge significantly affect consumers' attitudes toward

environmentally responsible consumption H3: Sustainable consumption knowledge positively influences attitudes toward sustainable consumption.

Green Trust and Attitude: Green trust reflects consumers' confidence that environmentally friendly products genuinely deliver environmental benefits and fulfill quality expectations. Stronger trust in green products encourages consumers to develop more positive attitudes toward sustainable consumption. Chen (2010) demonstrated that green trust is an important determinant of both attitudes toward and intentions to purchase green products. H4: Green trust positively influences attitudes toward sustainable consumption.

Subjective Norms and Sustainable Consumption Intention: According to Ajzen's (1991) Theory of Planned Behavior, subjective norms refer to the perceived social pressure exerted by important others, such as parents, teachers, and friends. When consumers perceive that these significant others support sustainable consumption, they are more likely to develop stronger intentions to engage in such behavior. Previous studies, including Han et al. (2010) and Paul et al. (2016), consistently reported a positive relationship between subjective norms and behavioral intention. H5: Subjective norms positively influence sustainable consumption intention.

Attitude and Sustainable Consumption Intention: Within the TPB framework, attitude is considered one of the strongest direct predictors of behavioral intention. Individuals who hold favorable attitudes toward sustainable consumption are more willing to purchase and use environmentally friendly products in the future. This relationship has been consistently supported by Ajzen (1991), Yadav and Pathak (2017), and numerous studies on green consumption. H6: Attitude toward sustainable consumption positively influences sustainable consumption intention.

Sustainable Consumption Intention and Sustainable Consumption Behavior: According to TPB, behavioral intention is the most immediate predictor of actual behavior. Individuals with stronger intentions to engage in sustainable consumption are more likely to translate those intentions into real actions. This relationship has been consistently confirmed by Ajzen (1991), Armitage and Conner (2001), and Yadav and Pathak (2017). H7: Sustainable consumption intention positively influences sustainable consumption behavior.

3. Research Methodology

3.1. Research Design

This study employed a quantitative research approach to test the proposed conceptual model and research hypotheses. The research was conducted in two stages.

The preliminary stage involved a comprehensive literature review and expert consultation to develop and refine the measurement scales appropriate for the cognitive characteristics and language proficiency of high school students. Five experts participated in this stage, including two lecturers in psychology, two lecturers in business administration, and one high school teacher. They evaluated the questionnaire in terms of content validity, semantic clarity, and comprehensibility. Based on their feedback, the questionnaire was revised and subsequently pilot-tested with 30 students to identify any remaining issues before the official survey was conducted.

The main study employed a structured questionnaire survey to collect quantitative data, which served as the basis for statistical analyses and hypothesis testing.

3.2. Research Population and Sampling

The research focused on psychological factors influencing sustainable consumption behavior among students at Van Xuan High School, Hanoi. The survey respondents consisted of 387 students enrolled at the school.

A convenience sampling method combined with stratified sampling by grade level was employed to ensure reasonable representation across Grades 10, 11, and 12. According to Hair et al. (2019), the minimum sample size for exploratory factor analysis should be between five and ten times the number of observed variables. Therefore, the sample size used in this study was considered adequate for subsequent multivariate analyses.

3.3. Research Instrument

Data were collected using a structured questionnaire consisting of two sections.

The first section gathered respondents' demographic information, including gender, grade level, average household income, and monthly personal expenditure.

The second section contained measurement items for the constructs included in the proposed research model. All measurement scales were adapted from previous studies on sustainable consumption behavior and modified to suit the context of Vietnamese high school students.

All observed variables were measured using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

3.4. Measurement Scales

The research model consists of eight latent constructs measured by 33 observed variables. The measurement items were adapted from previous studies on sustainable consumption behavior and modified to fit the characteristics of Vietnamese high school students.

Environmental Awareness (EA): Environmental awareness refers to students' understanding of environmental issues and the environmental consequences of consumption activities. This construct was measured using four observed variables: EA1: I believe that environmental pollution is a serious problem. EA2: I believe that human consumption activities directly affect the environment. EA3: I understand that every individual has a responsibility to protect the environment. EA4: I regularly pay attention to information about environmental issues.

Environmental Concern (EC): Environmental concern reflects students' level of concern and sense of responsibility toward environmental protection. It was measured using four observed variables: EC1: I am concerned about environmental pollution. EC2: I want to contribute to environmental protection through my own actions. EC3: I am willing to change my consumption habits to protect the environment. EC4: I am interested in environmental protection activities organized by my school.

Sustainable Consumption Knowledge (KN): Sustainable consumption knowledge reflects students' understanding of sustainable consumption concepts and environmentally friendly products. This construct was measured using four observed variables: KN1: I understand the concept of sustainable consumption. KN2: I know how to choose environmentally friendly products. KN3: I understand the meaning of eco-labels on products. KN4: I know that reusing and recycling help protect the environment. **Subjective Norms (SN):** Subjective norms refer to students' perceptions of social expectations from significant others regarding sustainable consumption. This construct was measured using four observed variables: SN1: My family encourages me to consume environmentally friendly products. SN2: My teachers encourage students to practice sustainable consumption. SN3: My friends support the use of environmentally friendly products. SN4: My purchasing decisions are influenced by people around me.

Green Trust (GT): Green trust reflects students' confidence in the environmental benefits and credibility of green products. It was measured using four observed variables: GT1: I believe that green products are safer for human health. GT2: I believe that green products are less harmful to the environment. GT3: I trust the environmental information provided on green product labels. GT4: I believe that using green products provides long-term benefits.

Attitude Toward Sustainable Consumption (AT)

Attitude refers to students' overall evaluation of sustainable consumption behavior. It was measured using four observed variables: AT1: Sustainable consumption is necessary. AT2: I enjoy using environmentally friendly products. AT3: I believe that sustainable consumption provides many benefits. AT4: I have a positive attitude toward environmentally friendly consumption behavior.

Sustainable Consumption Intention (BI)

Behavioral intention reflects students' willingness to engage in sustainable consumption in the future. This construct was measured using four observed variables: BI1: I intend to prioritize environmentally friendly products in the future. BI2: I intend to reduce my use of single-use plastic products. BI3: I intend to continue practicing environmentally responsible consumption. BI4: I intend to encourage others to practice sustainable consumption.

Sustainable Consumption Behavior (SCB)

Sustainable consumption behavior represents students' actual environmentally responsible consumption practices. It was measured using five observed variables: SCB1: I usually bring my own water bottle or reusable cup to school. SCB2: I try to minimize the use of plastic bags when shopping. SCB3: I save electricity and water in my daily life. SCB4: I choose environmentally friendly products whenever possible. SCB5: I sort or reuse waste whenever I can.

3.5. Data Analysis

The collected data were coded, screened, cleaned, and analyzed using IBM SPSS Statistics 26.0 and AMOS 24.0. The analytical procedure consisted of six stages. First, the dataset was examined for completeness,

missing values, and outliers, followed by descriptive statistical analysis of respondents' demographic characteristics. Second, the reliability of the measurement scales was assessed using Cronbach's alpha coefficients and corrected item - total correlations. Third, Exploratory Factor Analysis (EFA) was conducted using the Principal Component Analysis extraction method with Promax rotation to evaluate the underlying factor structure and eliminate inappropriate measurement items. Fourth, Confirmatory Factor Analysis (CFA) was performed in AMOS 24.0 to evaluate the measurement model, including model fit, composite reliability (CR), average variance extracted (AVE), convergent validity, and discriminant validity. Fifth, the proposed structural relationships and research hypotheses were tested using Covariance-Based Structural Equation Modeling (CB-SEM). Finally, a bootstrapping procedure with 5,000 resamples was conducted to estimate standard errors, confidence intervals, and the stability of the estimated path coefficients. Statistical significance was determined at the 5% significance level ($p < 0.05$).

Common Method Bias

Because all data were collected using self-reported questionnaires administered at a single point in time, the study also assessed Common Method Bias (CMB) using Harman's single-factor test. According to Podsakoff et al. (2003), common method bias is unlikely to be a serious concern if the first unrotated factor does not account for the majority of the total variance. The results indicated that the first factor explained 31.84% of the total variance, which is well below the recommended threshold of 50%. Therefore, there was no substantial evidence of common method bias affecting the study results.

4. Results

4.1. Sample Characteristics

A total of 387 questionnaires were collected. After excluding 15 invalid responses due to incomplete answers or evidence of straight-line responding, 372 valid questionnaires remained for analysis, yielding a valid response rate of 96.1%.

Table 1. Demographic Characteristics of the Respondents (n = 372)

Characteristics	Frequency Percentage (%)	
Gender		
Male	171	46.0
Female	201	54.0
Grade Level		
Grade 10	126	33.9
Grade 11	123	33.1
Grade 12	123	33.1
Monthly Personal Expenditure		
Below VND 500,000	91	24.5
VND 500,000 - 1,000,000	172	46.2
Above VND 1,000,000	109	29.3

The sample was relatively well balanced in terms of gender and grade level, thereby providing reasonable representation of students across the three grades.

4.2. Reliability Analysis

The internal consistency of the measurement scales was evaluated using Cronbach's alpha.

Table 2. Reliability Analysis Results

Construct	Number of Items	Cronbach's Alpha
Environmental Awareness (EA)	4	0.867
Environmental Concern (EC)	4	0.882
Sustainable Consumption Knowledge (KN)	4	0.846
Subjective Norms (SN)	4	0.873
Green Trust (GT)	4	0.889
Attitude (AT)	4	0.905
Behavioral Intention (BI)	4	0.914

Construct	Number of Items	Cronbach's Alpha
Sustainable Consumption Behavior (SCB)	5	0.918

All constructs exhibited Cronbach's alpha coefficients greater than 0.80, indicating excellent internal consistency. Furthermore, all corrected item-total correlations exceeded 0.40, and therefore no measurement items were removed from the analysis.

4.3. Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) was conducted using Principal Component Analysis with Promax rotation.

Table 3. Results of Exploratory Factor Analysis

Indicator	Value
KMO	0.931
Bartlett's Test of Sphericity $\chi^2 = 6528.431$	
Degrees of Freedom	528
Significance	< 0.001
Minimum Eigenvalue	1.184
Total Variance Explained	72.63%

The Kaiser-Meyer-Olkin (KMO) value of 0.931 indicates excellent sampling adequacy for factor analysis. Bartlett's Test of Sphericity was statistically significant ($p < 0.001$), confirming that the observed variables were sufficiently correlated to justify factor analysis. The EFA extracted eight factors, exactly matching the proposed theoretical framework. All measurement items demonstrated factor loadings greater than 0.65, and no problematic cross-loadings were observed.

4.4. Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was performed to evaluate the measurement model.

Table 4. Goodness-of-Fit Indices for the Measurement Model

Fit Index	Value
χ^2/df	1.86
GFI	0.913
TLI	0.957
CFI	0.964
RMSEA	0.048
SRMR	0.043

All model fit indices satisfied the recommended thresholds suggested by Hair et al. (2019), indicating that the measurement model exhibited a satisfactory fit to the observed data. The Composite Reliability (CR) values ranged from 0.86 to 0.93, exceeding the recommended threshold of 0.70, while the Average Variance Extracted (AVE) values ranged from 0.60 to 0.77, all above the recommended minimum of 0.50. These results confirm satisfactory convergent validity. In addition, the square root of the AVE for each construct exceeded its correlations with all other constructs, demonstrating adequate discriminant validity.

4.5. Structural Equation Modeling (SEM)

Following the validation of the measurement model, the structural model was estimated using Covariance-Based Structural Equation Modeling (CB-SEM).

Table 5. Model Fit Indices for the Structural Model

Fit Index	Value
χ^2/df	1.94
GFI	0.907
CFI	0.960
TLI	0.954
RMSEA	0.050

All goodness-of-fit indices met the recommended criteria, indicating that the proposed structural model provided a satisfactory representation of the observed data.

4.6. Hypothesis Testing

Table 6. Results of Hypothesis Testing

Hypothesis Path	B	S.E.	C.R.	p	Decision
H1 EA → AT	0.231	0.051	4.52	<0.001	Supported
H2 EC → AT	0.294	0.049	5.98	<0.001	Supported
H3 KN → AT	0.188	0.046	4.09	<0.001	Supported
H4 GT → AT	0.256	0.048	5.33	<0.001	Supported
H5 SN → BI	0.271	0.050	5.41	<0.001	Supported
H6 AT → BI	0.547	0.055	9.95	<0.001	Supported
H7 BI → SCB	0.684	0.043	15.91	<0.001	Supported

The results indicate that all seven hypotheses were supported at the 1% significance level. Among the antecedents of attitude toward sustainable consumption, environmental concern exerted the strongest influence ($B = 0.294$), followed by green trust ($B = 0.256$), environmental awareness ($B = 0.231$), and sustainable consumption knowledge ($B = 0.188$). Regarding behavioral intention, attitude toward sustainable consumption had a substantially stronger influence ($B = 0.547$) than subjective norms ($B = 0.271$). Finally, behavioral intention emerged as the strongest direct predictor of sustainable consumption behavior ($B = 0.684$), supporting the fundamental proposition of the Theory of Planned Behavior.

4.7. Explanatory Power of the Model

Table 7. Coefficients of Determination

Endogenous Variable	R ²
Attitude (AT)	0.612
Behavioral Intention (BI)	0.587
Sustainable Consumption Behavior (SCB)	0.468

The four psychological antecedents jointly explained 61.2% of the variance in attitudes toward sustainable consumption. Attitude and subjective norms together explained 58.7% of the variance in sustainable consumption intention. Behavioral intention accounted for 46.8% of the variance in sustainable consumption behavior. These coefficients indicate that the proposed model possesses relatively strong explanatory power for behavioral research in the social sciences.

4.8. Group Differences Analysis

Gender

An independent-samples *t*-test was conducted to examine differences in sustainable consumption behavior between male and female students. The results revealed a statistically significant difference ($t = -3.42$, $p = 0.001$). Female students reported a higher level of sustainable consumption behavior (Mean = 3.81) than male students (Mean = 3.54). This finding suggests that gender significantly influences sustainable consumption behavior, with female students being more likely to engage in environmentally responsible consumption practices.

Grade Level

A one-way analysis of variance (ANOVA) was performed to investigate whether sustainable consumption behavior differed across Grade 10, Grade 11, and Grade 12 students. The results indicated no statistically significant differences among the three grade levels ($F = 1.73$, $p = 0.179$). Therefore, grade level did not significantly influence sustainable consumption behavior in this study.

Monthly Personal Expenditure

The ANOVA results showed that monthly personal expenditure significantly affected students' tendency to purchase environmentally friendly products. Students whose monthly expenditure exceeded VND 1,000,000 reported a higher tendency to choose green products than those with lower expenditure levels ($F = 4.86$, $p = 0.008$). Furthermore, Tukey's post hoc test indicated that the significant difference existed between students spending less than VND 500,000 per month and those spending more than VND 1,000,000 per month.

5. Discussion

The findings demonstrate that the extended Theory of Planned Behavior (TPB) provides a satisfactory explanation of sustainable consumption behavior among students at Van Xuan High School. Overall, the empirical evidence supports the proposed research model and confirms the importance of integrating psychological factors into the TPB framework.

Among the antecedents of attitude, environmental concern exerted the strongest positive effect. This finding suggests that students who are genuinely concerned about environmental issues are more likely to develop favorable evaluations of environmentally responsible consumption. The result is consistent with previous studies emphasizing environmental concern as one of the most influential determinants of pro-environmental attitudes and behaviors (Bamberg & Möser, 2007; Kumar, 2021).

The study also found that green trust, environmental awareness, and sustainable consumption knowledge significantly enhanced students' attitudes toward sustainable consumption. These findings indicate that students who understand environmental issues, possess adequate knowledge of sustainable consumption, and trust the environmental claims of green products are more likely to develop positive attitudes toward environmentally responsible consumption. The results are consistent with previous research by Chen (2010), Mostafa (2007), and Paul et al. (2016).

Consistent with the Theory of Planned Behavior, attitude toward sustainable consumption was identified as the strongest predictor of behavioral intention, with a substantially larger standardized coefficient than subjective norms. This finding supports Ajzen's (1991) proposition that individuals' evaluations of a behavior play a more influential role in shaping intention than perceived social pressure. It also suggests that strengthening positive attitudes may be more effective than relying solely on external social influence when encouraging sustainable consumption among adolescents.

Although weaker than attitude, subjective norms also had a significant positive influence on behavioral intention. This result highlights the important role of parents, teachers, and peers in encouraging environmentally responsible behavior among high school students. Since adolescents are strongly influenced by their surrounding social environment, educational institutions and families can contribute substantially to fostering sustainable lifestyles.

The strongest relationship identified in the study was between behavioral intention and sustainable consumption behavior. The standardized path coefficient ($B = 0.684$) confirms the central proposition of the Theory of Planned Behavior that behavioral intention is the most immediate predictor of actual behavior. Students with stronger intentions to practice sustainable consumption were considerably more likely to translate these intentions into real consumption behavior. This finding is consistent with previous empirical studies conducted by Ajzen (1991), Armitage and Conner (2001), and Yadav and Pathak (2017). Overall, the results obtained from the reliability analysis, exploratory factor analysis, confirmatory factor analysis, and structural equation modeling were highly consistent. The satisfactory model fit indices, together with strong reliability and validity evidence, indicate that the proposed research model provides a robust explanation of sustainable consumption behavior among Vietnamese high school students.

6. Conclusion and Practical Implications

This study developed and empirically tested an extended Theory of Planned Behavior model to explain sustainable consumption behavior among students at Van Xuan High School, Hanoi. The findings demonstrate that the proposed model exhibits satisfactory reliability and validity, and all seven research hypotheses were supported.

Among the antecedents of attitude toward sustainable consumption, environmental concern was identified as the strongest predictor, followed by green trust, environmental awareness, and sustainable consumption knowledge. Both attitude and subjective norms positively influenced sustainable consumption intention, with attitude exerting a considerably stronger effect. Consistent with the Theory of Planned Behavior, behavioral intention emerged as the strongest direct predictor of sustainable consumption behavior.

The study also revealed significant demographic differences. Female students demonstrated higher levels of sustainable consumption behavior than male students, whereas no statistically significant differences were observed across grade levels. Students with higher monthly personal expenditure showed a greater tendency to purchase environmentally friendly products than those with lower expenditure levels.

These findings provide additional empirical support for applying the extended Theory of Planned Behavior to explain sustainable consumption behavior among Vietnamese high school students. Furthermore, the study contributes to the growing body of literature on sustainable consumption by highlighting the importance of incorporating cognitive and psychological factors into behavioral models.

Practical Implications

Several practical implications can be drawn from the findings.

First, schools should integrate sustainable consumption education into both formal curricula and extracurricular activities. Practical learning experiences, such as waste sorting, recycling campaigns, environmental clubs, and the development of "green schools," can strengthen students' environmental awareness, attitudes, and behavioral intentions.

Second, families should encourage environmentally responsible consumption habits and serve as role models by practicing sustainable lifestyles. Given the significant influence of subjective norms identified in this study, parental guidance plays a crucial role in shaping adolescents' consumption behavior.

Third, businesses should enhance transparency regarding environmental information, obtain credible eco-certifications, and implement responsible marketing strategies to strengthen young consumers' trust in environmentally friendly products.

Finally, government agencies and social organizations should intensify environmental communication through digital platforms, public campaigns, and school-based educational programs. These initiatives can contribute to improving environmental awareness, fostering positive attitudes, strengthening behavioral intentions, and ultimately promoting sustainable consumption behavior among younger generations.

Limitations and Future Research

Despite its contributions, this study has several limitations. First, the survey was conducted at only one high school in Hanoi, which limits the generalizability of the findings to other educational settings or regions. Second, the study relied on self-reported questionnaire data, which may be subject to social desirability bias and common response bias. Third, the proposed model focused primarily on psychological determinants and did not include other potentially influential factors such as personal values, social media exposure, financial conditions, product availability, or government policies. Future studies are therefore encouraged to employ larger and more geographically diverse samples, incorporate additional explanatory variables, and adopt mixed-methods approaches that combine quantitative and qualitative techniques. Such efforts would provide a more comprehensive understanding of sustainable consumption behavior among adolescents and further enhance the explanatory power of the research model.

Conflict of Interest Statement

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