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Research paper



Gen Y Green Purchasing Behavior in Relation to Energy Conservation and Environmental Preservation Products in Malaysia

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Abstract

The significant increase in the effect of global warming has given more attention to consumers to protect and preserve the environment. This is evident as we see the purchasing trends of consumers moving towards environmentally friendly products. In Malaysia consumers consist of three main generations with varied purchasing behaviors. The aim of this study is to investigate the variables affecting Gen Y consumer's green purchasing behavior. Phase 1 being qualitative in nature, involved five focus group interview sessions and a pilot study, while phase 2, being quantitative, involved the distribution and collection of questionnaires to Gen Y consumers of green products. The independent variables that affect green purchasing behavior are environmental concerns, attitudes towards the environment and environmental knowledge. Awareness of environmental problems was found not to be the variable that affects Gen Y green purchasing behavior. The implications of this study are that it supports energy conservation and environmental preservation businesses to better understand the green market environment, its opportunities and potential, enables businesses to better market their products, create products with competitive advantages and encourage the consumer's green purchasing intentions. Subsequently, this study assists the government or policy makers to promote green purchasing behavior among the Malaysia population.

Keywords:*green consumer behavior ;green purchasing; pro-environmental consumer behavior; sustainability*

1. Introduction

The term environmentalism is widely used for various environmental and ideological reasons. It is a word in common usage by stakeholders, business policy makers and even consumers. The concept of environmentalism, or perhaps better known as green growth, was endorsed as a new policy to focus on the long-term need to protect natural resources which are critical to economic development and human survival [1]. Initiated in 2005, the concept has evolved to look further into the environmental and energy related challenges, which are a driving factor to transform the energy ecosystems. A recent UNESCAP conference held in Bangkok in 2017 looked into four environmental and energy related challenges which included a reduction of environmental impacts. In line with the global initiative to reduce environmental impacts, recent studies also investigated topics associated with energy conservation and environmental preservation.[2]–[6].

The existence of environmentalism increases public participation in environmental planning and decision-making. Hence, environmentalism appears to be the key factor for business success today as sustainability is a new 'must-do' factor to survive and thrive [7], [8]. Although environmentalism is seen as a critical factor, businesses find it difficult to achieve it as each organization is unique and has different challenges [9], [10]. Unfortunately, there is no generic environmental approach or formula to suit all organizations. Hence, businesses are forced to develop their own strategies to invest in business sustainability [10].

1.1.Organization and Sustainability

Research into sustainability, [11]–[17] energy conservation [18]–[21] and environmental preservation [22], [23] are familiar topics for organizations, scholars and researchers. Many studies have indicated the importance of sustainability where greening the organization has become a key strategy for the existence of the business [7], [9], [10], [24], [25]. Greening an organization is seen to bring competitive advantage. Hence, organizations are encouraged to implement activities that will make them green. This includes efforts by organizations to obtain green certification [26], [27] known as EMS14001 [28], [29]. A survey conducted by the International Organization for Standardization (ISO) confirms an increase in annual growth of green certification globally. Table 1 indicates the highest percentage of green growth since 2010. In tandem with the global green growth, there has been an upward trend since 2014 which supports the statement that more organizations are going green, Evidently, organizations are embracing a green trend by securing green certification in order to be recognized and branded as a green organization [30].

As businesses around the globe are moving towards energy conservation and environmental preservation or sustainability, so is Malaysia joining the movement. Echoing the global quest for green growth, Malaysia officially began its green journey in the early 1970s with the introduction of environmental advocacy by initiating the Federation of Environmental Policy in the 3rd Malaysia Plan (3MP). Today, Malaysia has taken further steps in its 11th

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Malaysia Plan, 2016-2020 (11MP) by looking at stakeholders' desired behaviors and the opinions of consumers and industry. Its initiative and focus is the pursuit of green growth by: 1) strengthening the enabling environment for green growth, and 2) adopting a sustainable consumption and production concept by creating green markets. These sentiments have trickled down to the consumers through education and the promotion of green consumption.

Table 1: Annual growth of ISO14001 certification from 2010 to 2016 Source: https://www.iso.org/about-us.html

Year	2010	2011	2012	2013	2014	2015	2016
TOTAL	**8%**	**1%**	**7%**	**5%**	**8%**	**17%**	**17%**
Africa	9%	4%	20%	21%	1%	19%	17%
Central / South America	87%	1%	16%	21%	2%	0%	3%
North America	-14%	18%	15%	4%	-8%	6%	-3%
Europe	16%	-2%	11%	4%	3%	1%	1%
East Asia and Pacific	1%	3%	3%	4%	15%	14%	14%
Central and South Asia	-3%	8%	5%	32%	9%	7%	12%
Middle East	-9%	-4%	17%	21%	10%	21%	9%

As government agencies work on improving and enhancing the nation's green consumption, more and more businesses are moving from their traditional practices to green business practices [5]. Research indicates that the number of consumers preferring to purchase from companies that care about sustainability is growing [31], [32]. At the same time, people also believe that problems related to the environment are the side effects of marketplace factors such as technology and growing consumption linked to marketing activities which intend to satisfy consumers' needs and wants in relation to purchasing behavior [32]. Profit oriented companies are now revising their objectives to adapt green marketing initiatives into their business practices [33], [34]. However, some organizations believe that this transformation is only possible when consumers demonstrate an environmental consciousness which is then translated into an environmentally friendly purchasing commitment [35], more commonly known as green purchasing behavior (GPB).

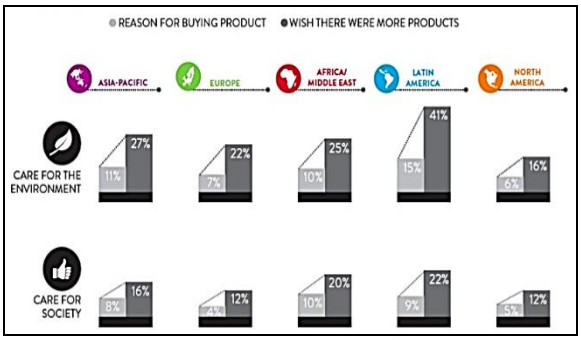


Fig 1: Opportunity to meet consumer demand for sustainable products Source:http://www.sustainablebrands.com/digital_learning/slideshow/behavior_change/current_state_consumer_expectations_purchase_drivers_arou

Figure 1 shows a study conducted by Sustainable brands, which clearly states that consumers prefer to make green purchases because they care about the environment and society. The same study also gives an indication that these consumers wish to see more green products available in the marketplace for them to purchase. Although studies point out that consumers are willing to pay extra to purchase a green product [36] there is still an obvious gap between the purchase intention and the actual purchase decision [35], [37]. It is still a challenge to understand what really drives consumers to purchase green products. The purchase of green products is more evident among Gen Y consumers compared to other generational cohorts such as Baby Boomers and Gen X [14], [30], [38]. Hence, the objectives of this study are:

1.1 To investigate the variables affecting Gen Y GPB in relation to energy conservation and environmental preservation products.

1.2 To analyze the relationship between environmental variables and Gen Y GPB in relation to energy conservation and environmental preservation products, and

1.3 To examine the extent to which Gen Y GPB affects a producer's manufacturing process and promotional strategies in regard to energy conservation and environmental preservation products.

This study was conducted to identify the determinants of GPB in relation to energy conservation and environmental preservation products, which are believed to contribute to the increase in the purchasing of green products. The organizations can benefit by understanding the requirements of their consumers and how these organizations can strategize their marketing activities to improve sales of green products. As stated in the 6th Thrust of the 11th Malaysia Plan, this study will meet the goal to pursue green growth for sustainability and resilience by adopting sustainable consumption and production concepts to create green markets.

2. Literature Review

For many years, researchers have studied the determinants of GPB. Different researchers have identified various variables that affect GPB under different circumstances. Studies have investigated variables such as green advertisements [39], [40], eco labeling [36], [40]–[42], eco branding [40], [43], [44], environmental attitudes [37], [42], green products [25], [41] and environmental knowledge [37], [42], [45] in relation to GPB. This indicates many industries seriously consider production and manufacturing processes to meet sustainable requirements [27], [28], [46]. These include companies that manufacture consumer technology products such as electrical appliances and packaging technology [47], [48]. However, the authors of previous studies have indicated that is a need to further explore other variables in relation to GPB. Hence, this study intends to look at other variables that influence GPB in the context of energy conservation and environmental preservation products in Malaysia.

2.1. Green Purchase Behavior (GPB)

Environmentally friendly purchasing commitment or GPB is defined as purchasing behavior in relation to a consumer's environmental consciousness. 'Green' here can be described as ecological consciousness, sustainability, environmental awareness, conservation, humanitarianism, new consumerism and corporate social responsibility [37], [49], [50]. Studies of GPB primarily investigated how consumers make informed choices in selecting green products, factors that drive consumers towards a certain purchasing habit and understanding the determinants of green purchases [48], [51], [52].

Many researchers have defined GPB as: 1) a set of behaviors that drive consumers towards a certain preference for products with environmental characteristics [53]; 2) displaying concerns about environmental attitudes and preferences [45]; 3) balancing time and monetary expenditure while satisfying current life needs and future needs of the generation [15] and 4) concern for future outcomes that benefit society as a whole i.e. a cleaner environment [54]. Although the definition of GPB appears to be interrelated and concerns ethical purchasing, [55] argues that it is difficult to find a unanimous definition of GPB. In addition, literature also indicates other problems in relation to GPB. Among them are the constant changes in consumer preferences [35], the lack of under-

standing on consumer's role of environmental and social issues [41] and industry's lack of will to green its product [56] .
Environmentally responsible purchasing behavior, green buying behavior and pro-environmental purchasing behavior are various terms used by researchers when referring to GPB. Studies indicate a trend in green purchases that favors a new segment of consumers known as the green consumers [57]. Green consumers are people who believe in purchasing products which are environmentally safe. They have concerns about the environment and consider the effect of their purchasing patterns on the natural environment around them [36], [58]. As argued above, many researchers see green consumers as being concerned with green issues and being ethical in their purchasing decisions where the environment is concerned. Although much research indicates that green consumers are willing to pay extra for green products [59], [60], this is not always translated into an actual green purchasing decision. Hence, it is critically important to study the variables that affect GPB in Malaysia. As consumers appear to be the driving force in the transformation of green businesses, the need to understand consumer purchasing behavior is essential.

2.2. Gen Y Consumers' Green Purchasing Patterns

Although studies of consumer behavior are an important factor, it is not an easy task because consumers vary in their behavior when it comes to their purchasing patterns. Research also indicates that Baby Boomers, Gen X and Gen Y have different purchasing behaviors and characteristics [30], [38], [61]–[64]. Considerable research has indicated that of the three main generations studied, Gen Y consumers appear to be the group that contributes the most to GPB [14], [30], [36], [38], [65]–[67].
In addition to problems in understanding the determinants of GPB, an even bigger challenge faced by companies is the purchasing behavior described as green purchasing intention. Studies are now developing a model to understand the green purchasing decision instead of just the green purchasing intention. An intention is not necessarily the same as actual behavior. Hence, it is important to focus on capturing the actual behavior and what motivates green consumers' purchasing behavior [51]. Although there is a growing trend in environmental or green consumerism in Malaysia, the purchasing behavior of consumers in Malaysia remains undetected [40], [59] and still far from clear [68].

2.3.Environmental Concern (EVC)

"Environmental concerns" is defined as "the extent to which people are aware of the issues related to the environment and support efforts to resolve them. EVC takes place when consumers express a willingness to contribute personally to their solutions" [69]. Researchers have found that consumers who are likely to exhibit environmentally conscious behavior and express a willingness to pay more for environmentally friendly products are also consumers with a high level of environmental concern [70][71]. [72] defined environmental concern as one's fundamental belief or personal value, which can be determined by the person's core value orientation. Environmental concern is seen to be a driver of GPB [73].
Although environmental concern is a motivator of green purchasing, studies indicate that it does not necessarily translate into actual purchasing behavior [35], [36], [45], [57]. A point still being debated [74]. A study by [75] states that very few people are anti-environment. In the same paper, he draws attention to the rather weak relationship between environmental concern and pro-environmental behavior. Given the two opposing views within the same research, this study believes that there is a need to investigate this variable. A variety of studies have been conducted in other countries regarding green products specifically; however, studies of environmental concerns are still very limited in Malaysia [76]. Hence, further study of environmental concerns needs to be conducted in Malaysia to see if there is a relationship between environmental concerns and GPB.

H1: There is a significant, positive relationship between environmental concern and Gen Y GPB in relation to energy conservation and environmental preservation products.

2.4. Attitude towards Environment (ATE)

[77] stated that social psychology includes the concept of "attitude", a judgment of good or bad reactions to certain objects, situations, and/or people. It can predict influence or change people's behavior. Attitude is also a complex construct that is derived from a combination of an individual's beliefs and values [78]. In general, the attitude towards the environment is defined as a set of cognitive behaviors or personal beliefs that lead to environmental protection. Attitude towards the environment is seen to be a significant variable that influences GPB [59], [72].
Many studies in the past have specifically focused on the attitude towards the environment and other environmentally related behaviors but from different perspectives [37], [42], [79]–[81]. Studies have indicated that attitude towards the environment is a variable that drives a consumer's purchasing behavior [82]. However, some researchers believe that awareness, as well as attitude, is required to support GPB. Yet, another study observed that a consumer's intention to purchase green products is not facilitated by his/her attitude towards the environment [35]. Therefore, in light of the contradictions in previous studies of the attitude towards the environment, this paper will study the relationship between the attitude towards the environment and GPB. Hence, the following hypothesis is proposed:
H2: There is a significant and positive relationship between the attitude towards the environment and Gen Y green purchasing behaviour in relation to energy conservation and environmental preservation products.

2.5. Environmental Knowledge (EVK)

Knowledge is a variable that enhances and influences a person's decision making process [83]. Based on the knowledge of a particular product, consumers develop favouritism, which will encourage them to purchase the product. The consumer's attitude towards a product which leads them to purchase it is also influenced by his/her knowledge of specific issues. For example, knowledge on the environment, pollution and sustainability will influence consumers to purchase green products [84]. In support of this statement, other researchers believe that when a consumer is familiar with an environmental problem and views saving the environment as an important issue, the consumer will most likely perform an environmentally responsible actions [85]–[89].
According to [90], knowledge has emerged as an essential variable in conducting research relating to consumer behaviour. However, there are contradictions in these findings. Knowledge is also known to lower the effect of fear arousal as it is negatively related to perceived risk [91]. This said, having knowledge tends to limit the influence of other variables on consumer's positive GPB. Therefore, the following hypothesis is proposed:
H3: There is a significant positive relationship between environmental knowledge and Gen Y green purchasing behaviour in relation to energy conservation and environmental preservation products.

2.6. Awareness of Environmental Problem (AEP)

Lack of awareness of environmental problems was identified as a significant problem in the early 1960s [92]. Environmental awareness can be defined as knowing the impact of human

behaviour on the environment [93]. The level of awareness of the environment has increased because many organizations have begun developing and launching greener products (with the support of consumers) to reduce the environmental impact
In a study conducted by [94], it was found that, compared with students from rural areas, students who lived in the city were more aware of the environmental problems surrounding them. In addition to the geographical factor, studies have indicated that awareness of environmental problems has an effect on children. The study found children to have feelings of sadness, anger and worry associated with environmental problems they can see around them [95]. The awareness of environmental problems is seen to affect consumer's buying behaviour due to the perceived relationship between environmental pollution and the awareness of environmental protection. Since these studies were targeted at children in developed countries, the relevance of these findings in the context of the Gen Y consumers in a developing country like Malaysia remains uncertain. Therefore, the following hypothesis is proposed:
H4: There is a significant positive relationship between awareness of environmental problems and Gen Y green purchasing behaviour in relation to energy conservation and environmental preservation products.

2.7. Theory of Planned Behavior

The Theory of Planned Behavior (TPB) by Azjen, 1991, was used in this study. TPB can help to provide an insight into determining the factors that can drive consumers to purchase green products. Using TPB, provides a clear understanding of consumer attitudes, subjective norms and perceived behavioral control determinants which show their intention to purchase green products [96], [97]. According to [97], attitudes shown in TPB refer to feelings of joy or discontent at performing certain behavior. Subjective norms are when consumers perform certain behavior that is influenced by their family members or friends who are considered important to them. On the other hand, perceived behavioral control is related to the perception of the internal and external constraints to perform a behavior.
TPB enables this research to understand the variables that influence attitude and concern for the environment by investigating EVC and ATE. TPB also refers to perceived behavioral control by measuring EVK as it is seen to be a control in consumer's GPB. The contribution of this study is to include AEP as an additional variable as it is subjected to changes in the environment and background of the respondents.

3. Conceptual Framework

This conceptual framework shows the relationship between the independent variables and dependent variable.

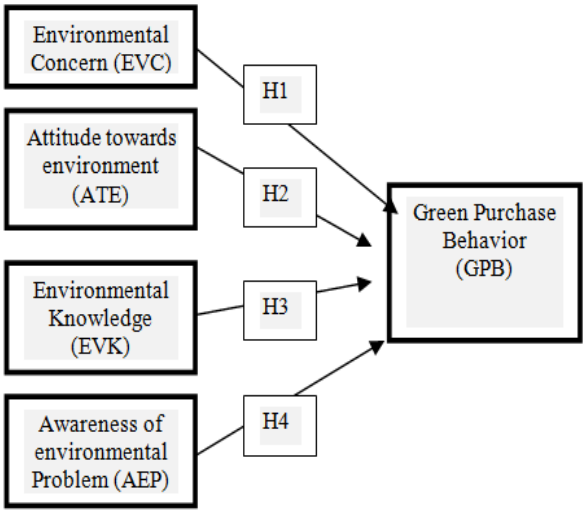


Fig.2: Gen Y green purchasing behavior

4. Methodology

4.1. Research Method

4.1.1. Respondents

The target population of this study was the Generation Y consumers who were born between 1977 to 1994 [38], [98]. These are consumers who were between 23 to 40 years of age at the time of the study. Respondents are Gen Y consumers who are inclined to use energy conservation and environmental preservation products. The respondents who were selected to participate in this study were deemed to possess a heightened sense of commitment towards embracing EVC, ATE, EVK and AEP best practice to enhance their GPB.

4.1.2. Instrument Development

Initially, the items were adapted from previous studies and all responses pertaining to dependent and independent variables were measured using a 5-point Likert scale. A focus group consisting of 10 Gen Y green product purchasers was set up. Its main task was to address the content validity of the instrument. Content validity is a subjective, yet systematic evaluation of how well the items of a variable represent that specific variable [99]. Given that this group of purchasers represents the unit of analysis, their input helped to refine this preliminary instrument derived from the literature and they also suggested adding new items to some variables based on the context of study in Malaysia. Next, a pilot study on 30 respondents from the target group was conducted to ensure that the questionnaire was clear, reliable and free from any major flaws. As a final step, prior to questionnaire distribution, the researcher approached selected academics who were keen researchers in this area of study and active industry professionals, to obtain their expert opinion on the relevance of the questions to the research objectives. For the purpose of data collection, a questionnaire containing a set of items to measure each of the variables of the study was developed.

4.1.3. The Distribution and Collection of Questionnaires

The collection of data took the form of a Mall intercept in the state of Selangor. According to the Malaysian Shopping Malls Associa-

tion and Tourism Malaysia, there are 28 malls in Selangor. The distribution and collection of questionnaires were based on the mall intercept method by [100], [101]. The mall intercept method was appropriate for this survey as the study was a consumer survey targeted at Gen Y who are known for their ability to spend [30], [102] at malls.

To ensure the representativeness of the population, the researchers conducted the survey by distributing an equal number of questionnaires at each location. The questionnaires were distributed to the target respondents who were not involved in the focus group discussion (or pilot study) to ensure a high degree of objectivity for the data collected. This study employed the conventional method of data collection. All standard research method processes and practices were observed including obtaining permission, use of third party individuals between the researcher and respondents to collect responses, seeking voluntary participation and ensuring research ethics were observed in the distribution and collection of the questionnaires. A team of interviewers were placed at all mall enterances to ask two qualifying questions namely: 1) Are you a consumer of energy conservation and environmental preservation products?; and 2) Are you aged between 20 and 43? If the potential respondents' answers were affirmative, the survey could proceed. Respondents were then asked if they were willing to participate in the questionnaire. An affirmative response indicated their voluntary participation. The respondents were then assured that the survey would take only about 10 minutes and were provided with a table and chair and a writing implement to facilitate the ease of completion of the questionnaire. Once completed, the questionnaires were collected by the interviewer and passed on to the researcher in due course. At the end of the data collection period, 319 usable responses were obtained.

4.1.4. Validity Analysis

The Kaiser Meyer Olkin (KMO) Measure of Sampling Adequacy for each variable was above 0.5 which indicated that there was no need to delete the items used to represent each variable before administering variable analysis. The Bartlett Test for Sphericity for each variable was significant at $p<0.05$ and indicated that there were sufficient correlations among the items representing each variable and therefore appropriate for variable analysis. Factor analysis was conducted to test the construct validity of the items used to measure the variables. Construct validity for each factor was conducted using the principal component analysis (PCA) approach.[103] proposed that items with loadings greater than 0.3 can be extracted, provided the sample size is a minimum of 50. According to [99] factor loadings in the range between 0.3 and 0.4 are considered statistically significant and meet the minimal level for interpretation of structure, while loadings of 0.5 or greater are practically significant and preferable. Loadings exceeding 0.7 are considered ideal and indicative of a well-defined structure. In summary, the factor solutions indicated that all items recorded loadings of greater than 0.60 using the Varimax rotation method. These factor loadings are practically significant and indicate a good correlation between the items and the variable grouping they belong to. The communality score for each item was higher than 0.5 In common research settings, having 30 to 50 items, communalities greater than 0.5 for most items are acceptable [99].

4.1.5. Reliability Analysis

[104] recommended that the Cronbach Alpha score of a variable that is greater than 0.70 indicated that the variable investigated has good reliability. The Cronbach Alpha scores for all the variables investigated were higher than 0.7 which indicated all the items used to measure their respective variables were reliable. The Cronbach Alpha scores for each of the variables investigated are set out in Table 2 and range between 0.710 and 0.886. Hence, no item measuring a variable was deleted during the reliability analysis.

Table 2: Reliability Test Results for All the Variables

Variable	Number of Items	Items Deleted	Cronbach's Alpha
Environmental Concern (EVC)	4	0	0.710
Attitude Towards the Environment (ATE)	7	0	0.837
Environmental Knowledge (EVK)	6	0	0.811
Awareness of Environmental Problems (AEP)	5	0	0.886
Green Purchase Behavior (GPB)	4	0	0.783

4.1.6. Multicollinearity Analysis

Data of multicollinearity analysis indicated that at $p < 0.05$ the tolerance values were above the minimum threshold for multicollinearity of 0.1 and below the maximum threshold of 10 for the Variance Inflation Factor (VIF). Given that the variables investigated were within the thresholds suggested by [99], the data was not seriously multi collinear for all four independent variables investigated. None of the variables indicated levels of multi collinearity that would seriously distort the regression variate.

4.1.7. Common Method Bias

It is essential to note that all studies are faced with unavoidable tradeoffs. It is very difficult to plan a study that is perfect and free from method bias. The researcher made every effort to minimize common method bias. The statistical remedies were undertaken through reliability, validity, multiple regression model fit and multicollinearity analysis. The procedural remedies undertaken were:

i) Conducting a FGD to ensure the items used to measure the variables were contextually, geographically, spatially and currently relevant
ii) Running a pilot study amongst some of the target respondents to ensure the respondents understood and knew exactly what the items meant
iii) Selecting respondents who had the necessary experience and exposure in relation to the variables and their respective items used in the study
iv) Avoiding ambiguous and double barrelled items
v) Using simple language, vocabulary and syntax that matched the respondents' capabilities
vi) Labelling all response options (scales) rather than just the end points
vii) Briefing the enumerator on the guidelines for the questionnaire distribution and collection and the need for data accuracy.
viii) Guaranteeing respondent anonymity by assuring the respondents that their feedback would be aggregated with that of other respondents and no one in the general population would see their individual responses

5. Analysis and Findings

The Analysis of Variance (ANOVA), as it appears in Table 3, provides information relating to the variation explained by the regression model compared to the unexplained variation. In Table 3 the regression sum of squares is 61.941 while the residual sum of squares is 133.994, producing a total sum of squares of 195.936. This total sum of squares represents the squared error that occurred when the mean of the GPB was used to estimate the GPB.

By using all four independent variables to estimate GPB, this error was reduced by 31.61%. This reduction is statistically significant at $p<0.05$, indicating the combination of the four independent variables significantly predict GPB.

Table 3: The Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	61.941	5	12.388	29.030	.000b
	Residual	133.994	314	.427		
	Total	195.936	319			

The Multiple Regression Analysis was performed to investigate the relationship between the identified independent variables (EVC, ATE, EVK and AEP) and the dependent variable (GPB). The result is depicted in Table 4 below.

The results in Table 4 show that R = 0.562, R^2 = 0.316, R^2 adj = 0.305, F (5, 315) = 29.030, $p<0.05$. The multiple correlation coefficients between the predictors (independent variables EVC, ATE, EVK and AEP) and the dependent variable (GPB) is 0.562 indicating the independent variables EVC, ATE, EVK and AEP considered in the regression model are moderately and positively correlated with the GPB and, therefore, made a moderate contribution to the GPB. The four independent variables investigated account for 31.6% of the variance in the GPB reflecting convergent validity of the independent variables on the GPB. 68.4% of the variations of GPB are due to other variables not investigated in this study. The adjusted R^2 is 0.305 indicating the result of this study is generalizable to other populations. Given that the adjusted R^2 is close to the R^2 value, it indicated that no overfitting of the model to the sample occurred (Hair et al., 2006, p.216). Clearly, the regression model fits the data very well. The R^2 value drops by only 0.011 in the adjusted R^2 that signifies the acceptable cross validity of this model. The F-test F(5,315) = 29.030 at $p<0.05$ indicates a significant association between the predictors (four independent variables investigated) and the dependent variable (GPB). In viewing the B (Beta) coefficients, the positive sign on all independent variables is an indication of a positive relationship between the independent variables and the dependent variable (GPB).

Table 4: Multiple Regression Analysis

Model	Un-Std		Std	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.770	0.298		2.582	0.010		
EVC	0.301	0.067	0.261	4.489	0.000	0.627	1.596
ATE	0.131	0.051	0.151	2.580	0.010	0.611	1.637
EVK	0.332	0.066	0.287	5.061	0.000	0.662	1.510
AEP	0.066	0.064	0.063	1.024	0.307	0.621	1.610
R	0.562						
R^2	0.316						
Adjusted R^2	0.305						
Std Error Estimate	0.65325						
F	29.030						
Sig.	0.000						

Among the four independent variables investigated, environmental knowledge (EVK) (β=0.287, t=5.061, p=0.000) recorded the highest standardized beta coefficient, which indicates that environmental knowledge is the most important variable in predicting Gen Y GPB. In descending order of importance follows environmental concern (EVC) (β=0.261, t=4.489, p=0.000) and attitude towards the environment (ATE) (β=0.151, t=2.580, p=0.010). By contrast, awareness of environmental problems (AEP) (β=0.063, t=1.024, p=0.307) is not significantly related to Gen Y GPB. This implies a better Gen Y GPB can be achieved or enhanced when the consumers have environmental knowledge, an environmental concern and attitude towards the environment but not with the awareness of environmental problems.

6. Discussion

Upon examination of the magnitude of the standardized beta coefficients of three significant variables, it was found that environmental knowledge was statistically the most significant. The Gen Y green purchasers felt that environmental knowledge, encompassing a broad range of understandings, contributed to their purchasing behavior. They believe they are very knowledgeable in terms of knowing what to do to protect the environment, the meaning of hybrid technology, their knowledge of renewable energy sources and recycling. This finding is consistent with the studies conducted by [85]–[87]

The next, most statistically significant variable is environmental concern. Respondents believed that the quality of the environment is deteriorating, that Malaysia's environment was a major concern and that they were emotionally involved in the environmental protection of the country. This finding is also described by [72], [73].

The third most significant variable was found to be their attitude toward the environment. This encompassed the view that environmental protection is effective and not a waste of money or resources. They also believe that environmental issues are part of their business operations, that environmental protection is meaningful and that it is wise for the country to spend considerable amounts of money to promote environmental protection and green living. Respondents also indicated that more work on environmental protection is needed and that it is important to raise environmental awareness amongst the Malaysian communities. Among the previous studies that reveal similar finding are [59], [72]

The only independent variable found not to be significant ($p<0.05$) was the awareness of environmental problems. Consequently, at this level of significance, if other samples of similar size, selected from the same population were investigated to identify variables that explain Gen Y GPB, it would be unlikely to be awareness of environmental problems. The finding that awareness of environmental problems was not significant implies that Gen Y purchasers feel that worsening environmental problems, the urgency to tackle Malaysia's environmental problems, the effects of environmental issues on public health, the threats to Malaysia's reputation and the seriousness of the country's environmental problems did not play major roles in Gen Y GPB. However, this finding runs contrary to the results revealed by [94], [95].

7. Future Research Recommendation

In future research of this field, a more comprehensive analysis and data collection is highly recommended. Therefore, future research should use a larger sample size and try to include other respondents such as Baby Boomers and Gen X. The study should also cover multiple urban locations in the five geographical regions to represent the national population. This will enable researchers to capture more reliable data and uncover a greater variety of collected data, thus achieving greater accuracy and more significant research results relating to GPB.

Cross-sectional studies can be defined as a "snapshot" or a study of a particular phenomenon at a particular time. On the other hand, longitudinal studies are studies of a particular phenomenon over

an extended period of time [105]. Cross-sectional analysis is able to capture the general behaviour representing the interests of targeted respondents, while longitudinal analysis can help to provide a better insight into the changes of purchasing behaviour patterns and trends of the respondents studied. Thus, longitudinal analysis is more suitable and appropriate for GPB and intentions studies as these two constantly change due to a variety of variables, over a period of time. This will further enhance the comprehensiveness of the result of study.

As for the conceptual framework of this study, there are only four variables included as independent variables. Based on the group research, there are various variables used to test consumer GPB by other researchers. For instance, environmental variables such as perceived consumer effectiveness (PCE), environment consciousness [36], [45], green prices [39], social influence [36] and government initiatives [36], [106]. It is strongly recommended that future research include other variables and sectors of GPB in order to gain a broader view and look at the picture from a wider perspective to further understand the consumer's GPB and intentions.

8. Research Limitation

Throughout the research process, there were several identified limitations of this study. These limitations were primarily due to respondents and cost and time constraints which were unavoidable. As a result, this study may not be as comprehensive as it could be due to the constraints encountered by the group.

In addition, most of the respondents were from the same generational cohort (Gen Y) which are consumers between 23 and 40 years of age during the time of study. Thus, this cannot be fully representative of the population of Malaysia. Therefore, the results of this study may not represent all definable targets.

The insignificant results of AEP may also have been caused by the wording used. The wording was quite confusing and lacked clear meaning. The variable could be changed into environmental awareness which has a positive meaning instead of awareness towards environmental problems that only focus on the problem and not on the broader scope. Thus, it is better to have environmental awareness in place rather than the awareness towards environmental problems.

Last, but not least, this study's setting was developed from an environmental perspective of GPB in relation to energy conservation and environmental preservation products. There are many other variables that may influence GPB besides environmental variables. However, this study is able to provide a foundation and guidelines for any future research.

10. Conclusion

The main focus of this study is the GPB of consumers who use energy conservation and environmental preservation products – specifically, Gen Y. The reason for choosing Gen Y is due to their potential purchasing power in the near future. Based on previous research, it was shown that the current Gen Y purchases green products such as organic foods and they have started to consider other categories as purchasing options. Based on the results collected for this study, Gen Y has positive intentions of purchasing green products such as energy saving electrical products and IT appliances, and a positive intent to continue GPB. Hence, these findings will act as a guide for producers to incorporate energy conservation and environmental preservation elements into the manufacturing process of their products. Furthermore, as this study indicates that consumers are highly aware of green products, marketers can also benefit from this study by incorporating promotional strategies highlighting energy conservation and environmental preservation elements. Overall, the research project has met its objectives to test the relationship between environmental concerns, the attitude towards environmental problems, environmental knowledge, and to generate awareness of environmental problems as part of Gen Y consumer GPB in relation to energy conservation and environmental preservation products in Malaysia. The implications of this study are that it supports energy conservation and environmental preservation businesses to better understand the green market environment, its opportunities and potential, enables businesses to better market their products, create products with competitive advantages and encourage the consumer's green purchasing intentions. Subsequently, this study assists the government or policy makers to promote green purchasing behaviour among the Malaysia population.

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