

The Influence of Environmental Knowledge and Concern on Green Purchase Intention the Role of Attitude as a Mediating Variable

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Abstract

Inadequate information related to green purchase intention among consumers has become a main impediment to both local and international marketers in developing a sound business and marketing strategies of green products. Thus, it is imperative to understand consumer behavior towards green products especially in Malaysia, where the trend is still new. Acknowledging this limitation, this paper thus aimed to investigate the influence of environmental knowledge and concern on green purchase intention among consumers, and simultaneously examining the effect of attitude as a mediator. The Theory of Reasoned Action was used to gauge consumer's green purchase intention. The current study investigates on green products in general with no focus on specific types of green product. Data collection through questionnaires was obtained from 384 Sabahan consumers, and this was done by way of convenience sampling approach. The findings of this study signify that environmental knowledge and environmental concern significantly influenced green purchase intention among consumers. More important, attitude is found to have a partial mediation effect on the relationship between environmental concern and green purchase intention. On the other hand, environmental knowledge does not predict attitude, thus attitude is found to have no mediating effect on the relationship between environmental knowledge and green purchase intention.

Key words: Green purchase intention, environmental knowledge, environmental concern, attitude, Theory of Reasoned Action, Sabahan consumers

1. Introduction

Globally, there is an incremental trend in green consumerism and green marketing. Although this trend might be common in the west countries, Asian countries have just started to receive its appearance (Asia's Media and Marketing Newspaper, 2008). Rex and Baumann (2006) stated that the aim of green marketing is to include environmental issues in the marketing efforts. In reality, green marketing is the current big thing which could help business to survive in a fast changing world (Smith, 2009).

According to Polonsky and Rosenberger (2001), 'going green' could present a firm with a three in one opportunity and creating a complete competitive advantage consists of low cost strategy, differentiation strategy and focusing strategy. Whilst, in consumers point of view, 'going green' describes their actions such as increased use of renewal energy, planting grass and flowers in their home, or bringing their owns bags to the grocery store (Siegenthaler, 2010).

As the green business is now becoming a new trend, it becomes the priority to the Malaysian Government. In the recent years, the Malaysian Government has been seriously involved in many green projects, namely in green technology, promoting green business and encouraging a green consumerism among Malaysians. Consequently, these steps managed to steer the country to improve its ranking in the environment ratings (GreenTech Malaysia, 2010). The environment rating is important as it provides a benchmark for a country of how close its afford to establish environmental policy goals. Based on the World Environmental Performance Index, Malaysia was ranked at number 27 out of 163 countries in 2008 but has significantly declined to number 54 in 2010 (Yale University, 2011). Malaysia has to regain and improve its ranking if the country wants to achieve its goal to be a fully developed country in the year of 2020. Therefore, intensive programs were taken by the Malaysian Government to achieve a green country status which include the implementation of a 15 years greening strategy in the 10th, 11th and 12th Malaysia Plan (Malaysia Ministry of Energy, Green Technology and Water, 2009).

To understand consumer perception, the attitude and behaviour towards green product is crucial and this has been widely researched in the western context. It is noted that there are extensive studies pertaining green purchase intention conducted by western scholars such as Chan and Lau (2000); Laroche, Bergeron and Barbara-Forleo (2001); Follows and Jobber (1999); Stone, Montgomery and Nkonge (2008); Schlegelmilch,Bohlen and Diamantopoulos (1996); Conraud-Koellner and Rivas-Tovar (2009); Pickett-Backer and Ozaki (2008); However, the similar studies is lacking in Malaysia.

According to Chen and Chai (2010), the problems of green marketing in Malaysia is due to the absence of information on green purchase intention and green behavior of Malaysian consumers, making it difficult for local and international marketers as well as other relevant agencies to develop their business and marketing strategies. They suggested that researchers in Malaysia should consider doing a research in the area of green purchase intention and a cross section of Malaysian population in the future. Therefore, this current study is motivated by Chen and Chai (2010) suggestions and thus a conceptual framework on green purchase intention and green behavior developed by Chan and Lau (2000) was adapted in this study. The framework is adopted due to the fact that it was one of the first to examine green purchase intention as dependent variable (Conraud-Koellner and Rivas-Tovar, 2009). The framework measured consumer green purchase intention using individual's environmental knowledge and environmental concern. However, Chan and Lau (2000) did not include consumer's attitude in their framework. Schlegelmilch et. al, (1996) believed that attitude is the most consistent predictor of environmental purchasing behaviour. Thus, this current study will integrate attitude in the framework, examining the effect of attitude as the mediating variable. This current study conceptualized that by observing the effect of attitude as a mediating variable, it may increase the level of understanding on the green purchase intention and green behaviour. Finally, all the above gaps contribute to the problem statements of: to what extent do consumers green purchase intention

influenced by environmental knowledge and concern, and does attitude mediate the relationships between environmental knowledge, concern and green purchase intention.

The main objectives of the current study are: (1) to investigate the relationship between environmental knowledge and environmental concern on green purchase intention; and (2) to investigate whether attitude mediates the relationship between environmental knowledge, environmental concern and green purchase intention. This study also aims to investigate Sabahan green consumers. This is important as Abdul Wahid, Rahbar and Shyan (2011) suggested that future study on green purchase intention in Malaysia should cover other states in the country in which a comprehensive generalization can be reached on Malaysian green behaviors, as there was limitation to their study which was conducted solely on green volunteers in Penang.

1.1 The Underpinning Theory

In marketing literatures, amongst the popular theories used to study purchase behavior are Theory of Reasoned Action by Azjen and Fishbein (1980) and Theory of Planned Behavior by Azjen and Fishbein (1991). The Theory of Reasoned Action generally used to predict behavioral intention. Meanwhile, Theory of Planned Behavior is used to explain and predict both the behavioral intention and actual behavior.

Gotschi, Vogel, Lindenthal and Larcher (2010) stated that a lot of researches have shown that consumers developed specific attitudes towards green products. This has made the Theory of Reasoned Action the best to explain green consumer behavior. This is supported by Ng and Paladino (2009) signifying that Theory of Reasoned Action is a reliable theory especially when examining the motivating factors behind the green purchase behavior.

According to the Theory of Reasoned Action, the most important determinant of a person's behavior is behavior intent. Gotschi et. al (2010) believed that behavior is a causal result from behavioral intention, and behavioral intention is a causal result from two causal variables: (1) attitudes and (2) subjective norms and both variables are determined by beliefs. Abdul Wahid et. al (2011) stressed that in order to apply the Theory of Reasoned Action in any study, two assumptions must be met and they are: (1) human being is rational and makes systematic use of information available to them; and (2) human intention to perform or not perform behavior is the immediate antecedent of the actions that under volitional control.

In short, this current study adopted the Theory of Reasoned Action as it can clearly explain the theoretical framework used for this study which comprised of belief (environmental knowledge and environmental concern), attitude and behavior intention components. Furthermore, due to the nature of this study which involved a cross-sectional data, measuring behavior intention is deemed to be sufficient instead of measuring the actual behavior of customers. Besides that, Gotschi et. al (2010) and Ng and Paladino (2009) suggested that the Theory of Reasoned Action can be a reliable theory to explain green consumer purchasing behavior.

2. Literature Review

2.1 Green Purchase Intention

Ng and Paladino (2009) defined behavioral intentions as a measure of a person's relative strength of purpose to execute certain behavior. Nik Abdul Rashid (2009) defined green purchase intention as the probability and willingness of an individual to give preference to green product over conventional products in their purchase considerations. However, Ramayah, Lee and Mohamad (2010) referred green purchase intention as a determination to act in a certain way.

Meanwhile, Han, Hsu and Lee (2009) defined green purchase intention as the likelihood of the hotel consumers of visiting a green hotel, engage in a positive word-of-mouth behavior, and willingness to pay more for the green hotel. Han et. al (2009) has developed a conceptual model to

investigate the relationship between attitude toward green behaviors, overall image and green behavioral attention among general hotel consumers in the U.S who were age range 18 years old and above. There were three (3) dimensions involved in their study such as visit intention, word-of-mouth intention, and willingness to pay more.

Chan and Lau (2000) has also developed a conceptualized model consisted of environmental concern, environmental knowledge, green purchase intention, actual purchase behavior and man-nature orientation. Their study suggests that actual purchase behavior was highly dependent on a person's green purchase intention and the model was aligned with Theory of Reasoned Action and Theory of Planned Behavior by Azjen and Fishbein (1980; 1991). The dependent variable – green purchase intention in Chan and Lau (2000) study has been measure by using as a single dimension with four statements.

Next, Qader and Zainuddin (2011) have done a study with intention to identify the influence of media exposure on purchase intention of lead-free electronic products (green electronics) amongst 170 lecturers in Universiti Sains Malaysia. They conceptualized green purchase intention as an individual's plan to involve in some action within a specific time and the probability that individual will perform an eco-behavior. Qader and Zainuddin (2011) have operationalized their dependent variable – green purchase intention as a single (1) dimension with three statements to measure intention.

For the purpose of this study, green purchase intention is conceptualized as a uni-dimension based on Chan and Lau (2000) and Qader and Zainuddin (2011) definitions. In addition, the definition of this dependent variable will be consistent with Nik Abdul Rashid (2009) which he defined green purchase intention as the probability and willingness of an individual to give preference to green product over conventional products in their purchase considerations.

2.2 Environmental Knowledge

According to D'Souza, Taghian and Lamb (2006) environmental knowledge evolves in two forms; (1) consumers have to educated to be understand the impact of a product to environment; and (2) consumer knowledge in the product itself being produced in an environmentally friendly way. There are many ways on how consumers seeking for knowledge and evidences suggest that consumers are seeking knowledge by reading product label (D'Souza et. al, 2006). If the consumer has knowledge about the environmental issues, then their awareness level would increase and thus would, potentially, promote favorable attitudes towards green products.

Mostafa (2007) has done a study to investigate the influence of three (3) cognitive and attitudinal factors on gender differences in green purchasing behavior. His respondents consisted of universities students across Egypt. The environmental knowledge was one of its variables and the environmental knowledge used in his study was a uni-dimension. Environmental Knowledge is defines as the knowledge on what people know about the environment, key relationships leading to environmental impacts, an appreciation of the 'whole systems', and collective responsibilities necessary for sustainable development (Mostafa, 2007).

Meanwhile, Conraud-Koellner and Rivas-Tovar (2009) defines environmental knowledge as the sets of ecological knowledge that an individuals have of environmental topics. Both of these researchers belief that environmental knowledge is influences by ecological ethnocentrism, degree of information, past behavior and perceptions about green products. On the other hand, Chan and Lau (2000) define environmental knowledge as the amount of knowledge a person has regarding environmental issues. Similar to Mostafa (2007) study, Chan and Lau (2000) also measures environmental concern as a uni-dimension variable.

Hence, in this study, environmental knowledge is conceptualized as a uni-dimension variable which includes the general aspects on what people know about the environmental issues. The

definition of environmental knowledge is also in line with the amount of environmental knowledge as proposed by Chan and Lau (2000).

2.3 Environmental Concern

Mat Said, Ahmadun, Hj Paim and Masud (2003) define environmental concern as a belief, stance and the degree of concern an individual holds towards the environment. In the study, these researchers tend to investigate the relationship between environmental knowledge, environmental concern, ecological conscious consumer behavior and in nature-related activities among Malaysian teachers in Selangor. The environmental concern variable in Mat Said et. al (2003) study consisted of seven (7) dimensions ranging from concern of waste, wildlife, biosphere, responsibility, education, health and energy awareness to environmental technology.

Diamantopoulos, Schlegelmilch, Sinkovics and Bohlen (2003) refer environmental concerns as a major factor in consumer decision making process. Three (3) dimensions of environmental concern were used to profiling green consumer among British consumers in Diamantopoulos et. al (2003) study which were: (1) knowledge about green issues; (2) attitudes towards environmental quality; and (3) environmental sensitive behavior.

However, Chan and Lau (2000) measure environmental concern as a uni-dimension as they adopted from a previous study by Maloney et. al (1975). The definition of environmental concern in Chan and Lau (2000) also adopted from Maloney et. al (1975), which environmental concern was refers to the degree of emotionality a person is attached to environmental issues.

Kalafatis, Pollard, East and Tsogas (1999) described environmental concern as the awakening and awareness of consumers in the fact that the environmental in danger and that natural resources are limited. The increasing number of consumers with environmental concern might be reflected by the increasing number of intention to purchase green products. According to Kalafatis et. al (1999) environmental concern may be multifaceted, it maybe more influential for some behaviors and it can be reflected in consumer daily activities.

In this current study, environmental concern is defined as the level of emotional and commitment towards environmental issues. The environmental concern variable will be conceptualized accordingly to Chan and Lau (2000) study, which acknowledges the variable as a uni-dimension factor.

2.4 Attitude

According to Amstrong and Kotler (2009), attitude is a person's consistently favorable or unfavorable evaluations, feelings, and tendencies toward an object or idea. Eagly and Chicken (1995) defined attitudes as a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor (Cited in Chen, 2009). Chen (2009) aimed to predict whether health consciousness and environmental attitudes influence Taiwanese consumer's attitude toward organic foods. The environmental attitude variable used was a uni-dimension and measured by a five-item measurement scale. Chen (2009) believes that environmental attitudes determines a person attitude toward organic foods and if a person is determine to become healthier, he or she will shows a positive attitude toward organic foods.

On the other hand, Chen and Chai (2010) adopted definition from Blackwell et. al (2006) and Schultz and Zelezny (2000) defines attitudes as acts that represents what consumers like and dislike and "attitude of environmental concern are rooted in a person's concept of self and the degree to which an individual perceives himself or herself to be an integral part of the natural environment". Generally in a common sense the more positive the attitude, the stronger the intention to perform a behavior and vice versa. Thus, in this study, attitude will be conceptualized as a single dimension based on Chen (2009) and the definition will be in line with Amstrong and Kotler (2009). However,

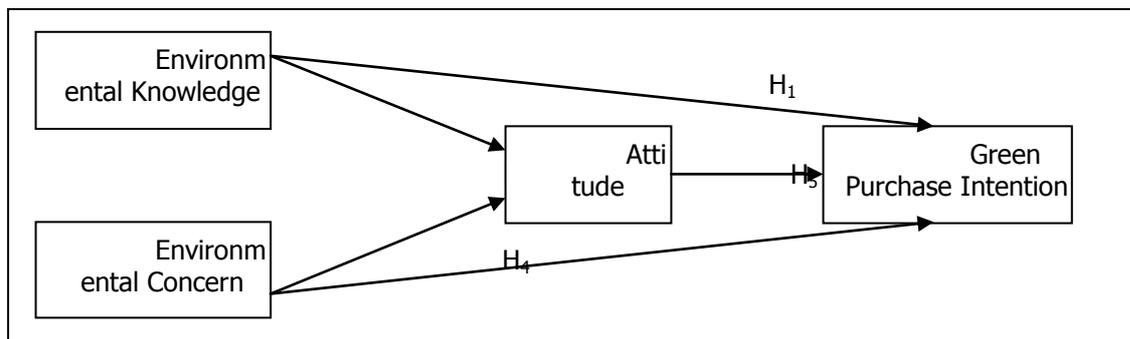
Theory of Reasoned Action will be used as the underlying framework to test the attitude roles in determining green purchase intention.

3. Research Framework And Hypotheses Development

A conceptual framework on behavior of ecological purchase developed by Chan and Lau (2000) was adapted in this study. In Chan and Lau (2000) framework, the independent variables consisted of environmental concern and environmental knowledge, man-nature orientation as antecedent factor and green purchase intention as the dependent variable and actual purchase as outcomes of the dependent variable. However, their framework did not included consumer's attitude towards Green Purchase Intention.

For the purpose of this study, Chan and Lau (2000) framework was modified by removing the man-nature orientation variable and actual purchase variable from the framework and adding attitude as a new mediating variable. Theory of Reasoned Action (TRA) was used to test the modified framework as attitude is one of the TRA components. The reasons why this current study removed the man-nature orientation variable and actual purchase variable was because of the time constraints due to the nature of this study. It is noted that Chan and Lau (2000) study was a longitudinal study, while the current study was a cross-sectional study. The conceptualization of the modified framework relating to the inter-relationship between the three (3) independent variables and the dependent variable are represented in Figure 1. All variables under investigations were uni-dimensional.

Figure 1: Conceptual Framework for this Current Study



3.1 Research Hypotheses

For reference, all seven (7) hypotheses have been formulated accordingly to Figure 1. A previous study done in 2001 by Laroche et. al found that environmental knowledge was not a good predictor of consumer's behavior for green products. Their result from the T-test indicated that average environmental knowledge score was exactly the same for both eco-friendly consumers and non eco-friendly consumers. Nevertheless, this study was an exploratory study and the discriminant analysis did not fully explain the relationship between the variables. In addition, the choice of factors included in the framework may not be exhaustive (Laroche et. al, 2001).

However, recent findings prove oppositely. In the new study, the variable "environmental knowledge" is the one that provides the greatest difference between the means of the clusters, since it present the lowest score (Paco and Raposo, 2009). Their discriminant analysis showed that there was a significant relationship between environmental knowledge and consumer green behavior. Mostafa (2009) highlighted the importance of environmental knowledge in the prediction of green consumer behavior. In his research, he discovered that there was a significant relationship between environmental knowledge and green consumer behavior. Therefore, there is possibility that the higher

level of environmental knowledge might produce much better pro-environmental acts such as green purchase intention among the consumers.

Due to contradictory results from previous studies (Laroche et. al, 2001; Paco and Raposo, 2009; Mostafa, 2009) on the relationship of Environmental Knowledge and Green Purchase Intention, which makes it interesting to investigate the relationship of these two variables. This current study therefore hypothesized that:

H₁: There is a significant relationship between Environmental Knowledge and Green Purchase Intention

There have been abundant evidences of environmental concerns might influence consumer buying intention. The positive interrelationships of these two variables have been studied extensively in the consumer research literature (Ramayah et.al ,2010; Chan and Lau, 2000). A study by Ramayah et. al (2010) involving Malaysian setting found that individual consequences were negatively related to green purchase intention and it was in lined with previous research findings. However, environmental consequences show non-statistically significant effects on green purchase intention among Malaysians baby diapers users, which contradict with previous findings. Ramayah et. al (2010) believe that the contradictions could be due to the fact that although Malaysians may be ethically aware of environmental consequences, they may not feel morally obligated to exhibit environmentally responsible purchase intention or behavior. Still, according to him, intention to purchase a specific product is found to be a good predictor of actual behavior in purchasing the product.

According to Chan and Lau (2000) both ecological concern and knowledge are important predictors of consumers' green purchase intention. By using structural equation model, Chan and Lau (2000) demonstrated that a strong positive relationship exist between ecological concern and green purchase intention. However, Paco, Raposo and Filho (2009) showed a contradictory findings, which, although their samples concern about the environment, but they did not turn their concerns into action and they rarely taking part in environmental events. Their concerns were more related to economics factors rather than environmental factors.

Again, due to contradictory results from previous studies (Ramayah, et.al, 2010; Chan and Lau, 2000; Paco et. al, 2009) on the relationship of Environmental Concern and Green Purchase Intention, it is imperative to investigate the relationship of these two variables, thus it is hypothesized that:

H₂: There is a significant relationship between Environmental Concern and Green Purchase Intention

There are many environmental consumerism research findings which produced inconclusive results pertaining to the relationship between attitude towards the environment and behavior (Gupta and Ogden, 2009). Therefore, to confirm the relationship between both environmental knowledge and environmental concern on attitude, it is suggested that:

H₃: There is a significant relationship between Environmental Knowledge and Attitude

H₄: There is a significant relationship between Environmental Concern and Attitude

Researches on consumer's attitudes towards green products have produced inconsistency results in their analysis. This mixed results challenge marketers on how to identify and effectively market green products to consumer. In spite of the extent the literatures suggest conflicting evidence on the influence of environmental attitude to behavior, attitudinal component was observed to be the most important predictor of green purchasing decision (Schlegelmilch et. al, 1996).

Apparently, attitude will subsequently have its effects on consumer behavior. For example, an inward environmental attitude will stimulate green purchasing intention, and an outward

environmental attitude will lead to general pro-environmental actions. In other words, a person with an outward environmental attitude can act in a friendly way to the general environment, but is not necessarily involved in a green purchasing behavior (Leonidou, Leonidou and Kvasova, 2010). However, based on the Theory of Reasoned Action, attitude should be motivating consumer to buy green products: Therefore, it is hypothesized that:

H₅: There is a significant relationship between Attitude and Green Purchase Intention

Yeoh and Paladino (2008) found that attitude only partially mediate the relationship between environmental knowledge and green purchase behavior. However, they found there was a full mediation effect by attitudes on the relationship between environmental concern and green purchase behavior. A different study by Paladino and Baggiere (2008) involving residential electricity customers, found that attitudes fully mediate the relationship between environmental knowledge and green purchase behavior. Hence, based on the above literatures, this study hypothesized that:

H₆: Attitude (Mediator) mediates the relationship between Environmental Knowledge (IV) and Green Purchase Intention (DV)

H₇: Attitude (Mediator) mediates the relationship between Environmental Concern (IV) and Green Purchase Intention (DV)

4. Research Methodology

4.1. Sampling procedures and data collection

Abdul Wahid et. al (2011) conducted a study on green purchase behavior, suggested that future study should cover other states in Malaysia for generalization purpose as they only conducted their study on green volunteers in Penang area. Chen and Chai (2010) who has done the same study but in the different context also suggested that future study should include a cross section of Malaysian population as their sample only consisted of undergraduate students from a major private university in Malaysia. In fact, study on ordinary consumer will most likely obtain a higher external validity than when using student subjects (Thogersen, Haugaard and Olesen, 2010). Therefore, for generalization purposes and to obtain a higher external validity, the population targeted for this current study is Sabahan consumers particularly those working adults.

The sampling size for this current study is 384 sabahan consumers and this size is deemed to be sufficient when sample size between 30 and 500 is already adequate for most research (Sekaran, 2000). The sample was the working age group, consisted men and women age ranged from 15 to 64 years old. Non-probability sampling through convenience sampling was used for the purpose of this study due to the fact that convenience sampling is the best way of getting some basic information quickly and efficiently (Sekaran, 2000). A total of 400 self-administered questionnaires were distributed evenly, by using online and offline questionnaire, across Sabah which involved five (5) divisions namely the West Coast Division, Interior Division, Kudat Division, Sandakan Division and Tawau Division. A total of 390 questionnaires (245 online questionnaires and 145 offline questionnaires) were returned and only 384 were usable. The other six (6) questionnaires were unusable because the respondents have left a few questions unanswered.

4.2 Measures

The questionnaire consisted of five (5) sections. Section A of the questionnaire was on respondent's demographic profile such as gender, marital status, age, monthly personal income, and education. Age and monthly personal income were modified as open ended questions. Race was added considered Malaysia multicultural identity and current location was also added to ensure that the questionnaires are distributed evenly in all five (5) divisions in Sabah.

Section B of the questionnaire which contained five (5) questions measured on the Environmental Concern of respondents based on a five (5) point Likert scale (1= Strongly Disagree, 5= Strongly Agree). All questions in Section B were adapted from Chan and Lau (2000).

Section C of the questionnaire which contained seven (7) questions which will be measured on the respondents' Environmental Knowledge relating to ecological issues based on a five (5) point Likert scale (1= Strongly Disagree, 5= Strongly Agree). All questions in Section C were also adapted from Chan and Lau (2000).

Section D of the questionnaire measured on respondents' attitude based on a five (5) point Likert scale (1= Strongly Disagree, 5= Strongly Agree). It contained three (3) questions which were taken from the questionnaire used by Mostafa (2007).

The last section, Section E of the questionnaire have four (4) corresponding intention statements to measure respondents' intention to purchase green products based on five (5) point Likert Scale (1= Strongly Disagree, 5= Strongly Agree). All the statements in Section E were adopted from Chan and Lau (2000).

5. Results And Discussion

5.1 Respondent Profile

Overall, frequency analysis revealed that the majority of the respondents were male (62.2%), married (57%) and mostly were Malay/Brunei ethnicity (68%). In addition, the sample composed of about 58.90 percent aged between 15 to 31 years old and 53.60 percent have monthly income range between RM 1,501 to RM 3,000.

In term of education level, majority of the respondents have entered university with percentage of 41.70 percent. Geographically, the four (4) divisions in Sabah comprised of West Coast Division, Interior Division, Sandakan Division and Tawau Division has 77 respondents each. While, only Kudat Division has 76 respondents.

Table 1: Profile of Respondents

Demographics	Frequency (N=384)	Percentage (%)
<u>Gender</u>		
Male	239	62.20
Female	145	37.80
<u>Marital Status</u>		
Single	148	38.50
Married	219	57.00
Others	17	4.40
<u>Age (Years)</u>		
15 – 31	226	58.90
32 – 47	140	36.50
48 - 63	18	4.70
<u>Monthly Income (RM)</u>		
Below RM 1,500	129	33.60
RM 1,501 – RM 3,000	206	53.60
RM 3,001 – RM 4, 500	37	9.60

Over RM 4, 501	12	3.10
<u>Education</u>		
PMR	17	4.40
SPM	151	39.30
STPM	56	14.60
University	160	41.70
<u>Race</u>		
Malay/Brunei	261	68.00
Chinese	16	4.20
Indian	1	0.30
Kadazan / Dusun / Murut	43	11.20
Rungus	4	1.00
Bugis	11	2.90
Jawa	5	1.30
Bajau / Suluk	31	8.10
Sungai	2	0.50
Cocos	2	0.50
Bisaya	5	1.30
Iban	2	0.50
Tidung	1	0.30
<u>Location</u>		
West Coast Division	77	20.1
Interior Division	77	20.1
Kudat Division	76	19.8
Sandakan Division	77	20.1
Tawau Division	77	20.1

5.2 Factor Analysis

An exploratory factor analysis was conducted to identify the uni-dimensionality of all variables under investigation which are green purchase intention (dependent variable), environmental knowledge (independent variable), environmental concern (independent variable), and attitude (mediating variable). However, the result of Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity needs to be considered as satisfactory before factor analysis can be proceed. According to Coakes, Steed and Ong (2009) to assume factorability the KMO must be greater than 0.60, the Bartlett's Test of Sphericity must be large and significant, anti-image correlation matrix and communality values must be greater than 0.50 and Eigenvalues must be greater than 1.

5.3 Factor Analysis for Green Purchase Intention

The process of factor analysis for green purchase intention involved one (1) iteration only. In the process of iteration one, none of the items being dropped thus all four (4) original items are remained. All items were factor loaded and formed as one (1) factor only which accounted for 64.52 percent (R Square) of variance. This confirmed the uni-dimensionality of this variable as conceptualized by Chan and Lau (2000) and Qader and Zainuddin (2011). Factor 1 is renamed as green purchase intention. The result of Kaiser-Meyer-Olkin (KMO) was reported at 0.634 and the result of Bartlett's Test of Sphericity was significant at $p=0.000$ (refer Table 2). All anti-image correlations items for the dependent variable of this study showed values greater than 0.50 and the communality values are between 0.548 to 0.712. Meanwhile, the Eigenvalues for this analysis was at 2.581. This indicates that the results have met all the requirements, which is in line with Coakes et. al (2009).

Table 2: *Factor Analysis for Green Purchase Intention – First Iteration*

Items	Green Purchase Intention
I consider buying products because they are less polluting. (E1)	0.740
I intend to buy products because they are less polluting. (E2)	0.785
I consider switching to other brands for ecological reasons. (E3)	0.839
I intend to switch to other brand for ecological reasons. (E4)	0.844
Eigenvalue	2.581
% of variance explained	64.518
Kaiser-Meyer-Olkin (KMO)	0.634
Bartlett's Test of Sphericity	612.017

Note: Extraction Method: Principal Component Analysis
a. 1 component extracted

5.4 Factor Analysis for Environmental Knowledge

The process of factor analysis for environmental knowledge involved five (5) iterations, which in the first round there were two (2) factors constituted. As a result, items C1, C3, C4 and C5 for environmental knowledge were removed due to its lowest communality values, or dual factor loadings. Although the communality value for item C3 has meet the assumptions (exceed 0.50), the items were removed in order to increase the percentage of variance. The final round (fifth iteration) of the factor analysis for independent variable ended with one (1) factor loaded, which the original seven (7) items were condensed into three (3) items. All anti-image correlations items showed values greater than 0.50 and the communality values are between 0.562 to 0.731. Table 3 shows that environmental knowledge has fulfilled the criteria of Kaiser-Meyer-Olkin (KMO) >0.60 and the result of Bartlett's Test of Sphericity is significant with Eigenvalues for the factor loaded is more than 1. Furthermore, all three (3) items that have been remained had factor loadings with factor loading values ranges from 0.749 to 0.855, in which accounted for 62.25 percent of variance (R square). In addition, this factor analysis for environmental knowledge confirmed the uni-dimension of the environmental knowledge as conceptualized by Chan and Lau (2000).

5.5 Factor Analysis for Environmental Concern

The process of factor analysis for environmental concern involved three (3) iterations. Even though, in the first round there was only one (1) factors constituted, but most of the items were not met factor analysis assumptions. As a result, items B2 and B5 for environmental concern were removed due to its communality values least than 0.50. The final round (third iteration) of the factor analysis for environmental concern (independent variable) ended with one (1) factor loaded, which the original five (5) items were condensed into three (3) items. Environmental concern has fulfilled the criteria of Kaiser-Meyer-Olkin (KMO) >0.60 and the result of Bartlett's Test of Sphericity is significant with Eigenvalues for the factor loaded is more than 1 (refer Table 4). In addition, all three (3) items that have been remained had factor loadings with factor loading values ranges from 0.731 to 0.773, in which accounted for 57.14 percent of variance (R square). More, this factor analysis for environmental concern confirmed the uni-dimension of the environmental concern as conceptualized by Mostafa (2007).

Table 3: Factor Analysis for Environmental Knowledge –
Fifth Iteration (Final Round)

Items	Environmental Knowledge
(C2) Most smokes in our big cities come from automobiles.	0.749
Practically all of the pollution in the atmosphere is caused by cars. (C6)	0.855
Synthetic pesticide takes about 200 years to deteriorate into harmless chemicals. (C7)	0.758
Eigenvalue	1.867
% of variance explained	62.245
Kaiser-Meyer-Olkin (KMO)	0.627
Bartlett's Test of Sphericity	214.109
Note: Extraction Method: Principal Component Analysis a. 1 component extracted	

Table 4: *Factor Analysis for Environmental Concern – Third Iteration (Final Round)*

Items	Environmental Concern
It frightens me to think that much of the food I eat is contaminated with pesticides. (B1)	0.731
I became angry when I think about harm being done to environment by pollution. (B3)	0.773
When I think of the ways industries are causing pollution, I get frustrated and angry. (B4)	0.764
Eigenvalue	1.714
% of variance explained	57.144
Kaiser-Meyer-Olkin (KMO)	0.645
Bartlett's Test of Sphericity	132.521
Note: Extraction Method: Principal Component Analysis a. 1 component extracted	

5.6 Factor Analysis for Attitude

The process of factor analysis for attitude involved one (1) iteration only and the process has extracted one (1) factor, which confirmed the uni-dimension of this variable as conceptualized by Chen (2009). The result of Kaiser-Meyer-Olkin (KMO) was reported at 0.707 and the result of Bartlett's Test of Sphericity was significant at $p=0.000$ (refer Table 5). All the three (3) initial items are remained with Eigenvalues of 2.166 and total variance of 72.22 percent (R Square). All anti-image correlations items showed values greater than 0.50 and the communality values are between 0.686 to 0.761, which indicates that the results have met all the requirements, concur with Coakes et. al (2009).

Table 5: *Factor Analysis for Attitude – First Iteration*

Items	Attitude
I like the idea of green products. (D1)	0.848
Green product is a good idea. (D2)	0.872
I have a favorable attitude towards a green version of a product. (D3)	0.828
Eigenvalue	2.166

% of variance explained	72.216
Kaiser-Meyer-Olkin (KMO)	0.707
Bartlett's Test of Sphericity	378.743

Note: Extraction Method: Principal Component Analysis
a. 1 component extracted

5.7 Reliability Analysis and Descriptive Analysis

Selvanathan, Selvanathan, Keller and Warrack (2004) stated that questions with Cronbach Alpha above 0.50 can be used and acceptable. The results in Table 6 revealed that all items have Cronbach Alpha values ranged between 0.623 to 0.814. Therefore, it can be concluded that all the items (after factor analysis) under studied were acceptable.

In addition, in this study a five (5) Likert Scale (1= Strongly Disagree, 5= Strongly Agree) was used to measure all of the variables. Environmental concern was reported to have the highest mean scores of 4.37, followed by attitude (mean = 4.35), green purchase intention (mean = 4.13), and environmental knowledge (mean = 3.81). Hence, it can be concluded that, all of the mean scores reported were more towards “agree” to “strongly agree” opinions.

Meanwhile, the standard deviation for all the variables under investigation ranged from 0.586 to 0.840 indicates that the answers are nearly normally distributed. As stated by Selvanathan et. al (2004) the nearer the standard deviation to one (1) is the better.

Table 6: Reliability Analysis, Means and Standard Deviation of the Study Variables

Variables	No. of Items (Initial)	No. of Items (After Factor Analysis)	Alpha Value	Mean	Standard Deviation
<u>Dependent Variable</u>					
Green Purchase Intention	4	4	.814	84.13	0.688
<u>Independent Variable</u>					
Environmental Knowledge	7	3	.694	84.81	0.840
Environmental Concern	5	3	.623	84.37	0.586
<u>Mediating Variable</u>					
Attitude	3	3	.806	84.35	0.595

Note: All items used a 5-point Likert Scale (1= Strongly Disagree, 5= Strongly Agree)

5.8 Correlation Analysis

A bivariate correlation analysis (Pearson product moment correlation) was performed on all the variables under investigation. According to Coakes et. al (2009) Pearson product moment correlation gives information regarding the linear relationship between two continuous variables, and the value of this correlation coefficient range between -1 and +1, while the sign (+ or -) indicates the direction of the relationship. The results from table 7 revealed that environmental concern have weak positive correlations with environmental knowledge ($r=0.278$, $p=0.000$), attitude ($r=0.138$, $p=0.003$), and green purchase intention ($r=0.296$, $p=0.000$). Meanwhile, environmental knowledge have weak to medium positive correlations with attitude ($r=0.024$, $p=0.319$) and green purchase intention ($r=0.359$, $p=0.000$). Finally, attitude has a moderate positive correlation with green purchase intention ($r=0.312$, $p=0.000$). Overall, the results found that all the variables are not correlated to each other.

Table 7: *Result for Bivariate Correlation Analysis*

	Environmental Concern	Environmental Knowledge	Attitude	Green Purchase Intention
Environmental Concern	1.00			
Environmental Knowledge	0.278**	1.00		
Attitude	0.138**	0.024	1.0	
Green Purchase Intention	0.296**	0.359**	0.3	1.00

** Correlation is significant at the 0.01 level (1-tailed)

5.9 Hypotheses Testing

In order to achieve the objectives of this study multiple regression analyses (standard/simultaneous regression analysis and hierarchical regression analysis) were conducted in accordance to Baron and Kenny (1986) suggestion. According to Baron & Kenny (1986) in assessing mediating effect, there are four (4) steps need to be followed during regression analyses and the significance of the coefficients must be examined in at each step. The four (4) steps are:

- [1] Regressing independent variable(s) and dependent variable;
- [2] Regressing independent variable(s) and mediator;
- [3] Regressing mediator and dependent variable; and
- [4] Regressing independent variable(s), mediator and dependent variable.

Next, the discussion on the findings of this current study would be based on the objectives and seven (7) hypotheses listed earlier. The discussion focused and explained on the outcome between environmental knowledge, environmental concern, attitude, and green purchase intention based on Baron and Kenny's (1986) procedures.

5.10 Relationship between Environmental Knowledge and Green Purchase Intention

In this current study, the result for hypothesis 1 (refer table 8) which predicts that there is a significant relationship between environmental knowledge and green purchase intention showed that there was a significant relationship ($\beta=0.300$, $p=0.000$). As a result, hypothesis 1 is supported and met the first assumption by Baron and Kenny (1986).

Previous study by Paco and Raposo (2009) and Mostafa (2009) also showed that there was a significant relationship between environmental knowledge and consumer green behavior. The current finding also in line with Kim and Chung (2011) when they found that individual past experiences which contribute on individual knowledge with organic products have a significant impact on purchase intention for organic products. Although, there might be the differences exist between organic personal care products and other green products, Kim and Chung (2011) argues that similar values will shape consumer behaviors with all these green products.

Thus, the findings of the current study suggest that the more knowledgeable Sabahan consumer is with regard to the environmental issues, the more likely is their intention to purchase green product. In addition, it can be concluded that environmental knowledge can be recognized as a factor in predicting or influencing consumer buying decision. This concurs with Mostafa (2009) and Chan and Lau (2000) which they highlighted the importance of environmental knowledge in the prediction of green consumer behavior.

Table 8: *Multiple Regression Analysis of Environmental Knowledge and Environmental Concern with Green Purchase Intention*

Dependent Variable	Independent Variables	Standardized Beta (Step 1)	P Value (Step 1)
Green Purchase Intention	Environmental Knowledge	0.300*	0.000
	Environmental Concern	0.213*	0.000
R Square		17.10	
Adjusted R Square		16.60	
F Value		39.248	

* Regression is significant at the 0.05 level.

5.11 Relationship between Environmental Concern and Green Purchase Intention

As illustrated in table 8, the multiple regression analysis results of the current study ($\beta=0.213$, $p=0.000$; $F=39.248$), hypothesis 2 which predicts that there is significant relationship between environmental concern and green purchase intention, is supported and met the first assumption by Baron and Kenny (1986). The current finding indeed contradicts with the finding of Ramayah et. al (2010) involving Malaysians baby diapers users when their study found that environmental concern show insignificant effects on green purchase intention. The contradictory of the current and Ramayah's might due to the different settings of the both studies. A specific green product was used in Ramayah et. al (2010) study whilst this current study focused on a general green products.

However, this finding is in line with a study by Chan and Lau (2000) which demonstrated that there is a significant relationship exists between ecological concern and green purchase intention amongst their respondents. Another study by Fraj and Martinez (2006) also showed a significant coefficient between ecological patterns and environmental behavior, which means that those individual involved and concerned for environment show a higher ecological behavior.

Many findings indicated that environmental concern has an influence on consumer purchasing patterns, with more and more consumers prefer to buy the green products. Thus, this study suggests that the more concern Sabahan consumers are towards the environment, the more likely of their intention to purchase green product. Furthermore, environmental concern can be identified as one of the important factors that affect consumers' green purchasing behavior.

5.12 Relationship between Environmental Knowledge and Attitude

Result from multiple regression analysis shows that at significant level of 0.05, the corresponding standardized regression coefficients for environmental knowledge is insignificant at $\beta=-0.015$, $p=0.771$, $F=3.718$ (refer table 9). In other words, environmental knowledge did not predict the attitude. Thus, hypothesis 3 is rejected and has not fulfilled Baron and Kenny's (1986) assumptions. This current finding is contradicted with Nik Abdul Rashid (2009) study which he reported the relationship between attitude towards environmental protections and green purchase intention was decisively mediated by consumer awareness of eco-label for the chosen product. His results also indicated consumers that have acquired knowledge through their own experience have higher intention to purchase a green product, and can be further enhanced with the existence of an eco-label. Therefore, the current study suggests that although Sabahan consumers already have environmental knowledge, this knowledge will not influence their attitude. Thus attitude will not mediate or influence their intention to purchase a green product through environmental knowledge.

Table 9: *Multiple Regression Analysis of Environmental Knowledge and Environmental Concern with Attitude*

Mediating Variable	Independent Variables	Beta	Standardized (Step 2)	P Value (Step 2)
Attitude	Environmental Knowledge		-0.015	0.771
	Environmental Concern		0.142*	0.008
R Square			1.90	
Adjusted R Square			1.40	
F Value			3.718	

* Regression is significant at the 0.05 level.

5.13 Relationship between Environmental Concern and Attitude

Based on table 9, the result for multiple regression analysis on hypothesis 4 is significant at $\beta=0.142$, $p=0.008$, $F=3.718$, which it can be concluded here that environmental concern did predict attitude thus fulfilled Baron and Kenny's (1986) assumptions. Therefore, hypothesis 4 is supported. This current finding is consistent with the study by Han et. al (2009) which their research showed that consumers who concern for the environment will have favorable attitudes towards eco-friendly products or services. This attitude includes the customers who show a positive perception on green hotel images and willing to stay, paying more and willing to recommend the green hotel to their friends. However, this current finding contradicts with Arnold (2009) and Straughan and Roberts (1999). According to Arnold (2009), in the United State, nearly 40 percent of those environmentally concerned were doing nothing to protect the environment. While, Straughan and Roberts (1999) claimed that if a person is environmentally concerned, that person is unlikely to be more proactive in his or her attitude unless that person would feel to be involved. As a result, this current study suggests that the more concern Sabahan consumers are towards the environment, the attitude would be greater, and subsequently this attitude may lead to intention to purchase a green product.

5.14 Relationship between Attitude and Green Purchase Intention

Results in table 10 showed that the corresponding standardized regression coefficients for attitude in this study is significant ($\beta=0.312$, $F=41.147$, $p=0.000$), and attitude account for 9.70 percent (R Square) of the variances in green purchase intention. Hence, hypothesis 5 is supported. This current finding is also supported by Schlegelmilch et. al (1996) which they found that attitudinal component was observed to be the most important predictor of green purchasing decision. Meanwhile, Leonidou et. al (2010) reports that certain cultural, political and ethical factors are responsible for the adoption of an environmental attitude by consumers, whether when specifically making personal purchasing decisions (inward) or when broadly considering issues relating to society (outward). An inward environmental attitude will stimulate green purchasing intention, and an outward environmental attitude will lead to general pro-environmental actions. Hence, the current study suggests that there is a significant relationship between attitude and green purchase intention among Sabahan consumers. Attitude can directly be a determinant for green purchase intention or indirectly can be a mediator to mediate the relationship between other factors with green purchase intention.

Table 10: *Multiple Regression Analysis of Attitude with Green Purchase Intention*

Dependent Variable	Mediating Variable	Standardized Beta (Step 3)	P Value (Step 3)
Green Purchase Intention	Attitude	0.312*	0.000
R Square			9.70
Adjusted R Square			9.50
F Value			41.147

* Regression is significant at the 0.05 level.

5.15 Relationship between Environmental Knowledge, Environmental Concern and Green Purchase Intention. The Roles of Attitude as a Mediator

As proven in the earlier analysis, only environmental concern has fulfilled all the requirements made by Baron and Kenny's (1986). On the contrary, environmental knowledge did not predict attitude, which provoked the assumptions thus hypothesis 6 is rejected. Therefore, the current study only focused on the relationship between environmental concern and green purchase intention (hypothesis 7). A hierarchical regression analysis results showed that the corresponding standardized regression coefficient for environmental concern on green purchase intention in Model 2 has a smaller effect than in Model 1 which the beta is reduced from $\beta = 0.213$, $p=0.000$ in Model 1 to $\beta = 0.173$, $p=0.000$ in Model 2 (refer table 11). While attitude (mediator) has a significant effect ($\beta=0.281$, $p=0.000$). Hence, hypothesis 7 is supported because the result confirmed that attitude has partially mediating effects on the relationship between environmental concern on green purchase intention.

Despite the level of mediation being different, this current finding concurs with Yeoh and Paladino (2008) in which they found that there was a full mediation effect by attitudes on the relationship between environmental concern and green purchase behavior. Therefore, it can be concluded that, consistent with the Theory of Reasoned Action by Ajzen and Fishbein (1980), attitude does have a level of mediating effects on the relationship between environmental concern on green purchase intention, which in the current study, attitude is found to be only partially mediated the relationship between environmental concern and green purchase intention among Sabahan consumers.

Table 11: Hierarchical Regression Analysis of Environmental Knowledge, Environmental Concern, and Attitude with Green Purchase Intention

Dependent Variable	Independent Variables	Mediating Variable	Model 1	Model 2	Model 3	Model 4
			Std. β	F Value	Std. β	F Value
Green Purchase Intention	Environmental Knowledge		.300	.000	.304	.00
	Environmental Concern		.213*	.000	.173*	.00
	Attitude				.281*	.00
R Square				17.10		24.80
Adjusted R Square				16.60		24.20
F Value				39.248		41.803

nt at the 0.05 level.

* Regression is significant

5.16 Discussion and Conclusion

This current study tested the relationships of two independent variables (environmental knowledge and concern) and a mediating variable (attitude) on consumers' green purchase intention in Malaysia particularly in Sabah, indeed a non-western context, by using the Theory of Reasoned Action (TRA) to explain the theoretical framework of the study. From the results, environmental knowledge, environmental concern, and attitude were found to enhance the explanation of the Theory of Reasoned Action specifically in predicting consumer green purchase intention.

This current study also found that there is significant direct influence between environmental knowledge and concern on green purchase intention among Sabahan consumers. Therefore, this information can be used by marketers to improvise their marketing strategies. The conventional mix marketing strategies which are the 4Ps (product, price, place and promotion) can also be implemented in the green marketing area. For instance in product development, marketers can provide information on green consumptions trends and green products attributes such as organic, bio-chemicals, energy saving, etc to cater for the needs of consumers who prefer green products. While, in terms of pricing, consumers can be charged if they opt to use plastic bags while shopping. This can help to encourage consumers in reducing the use of plastic bags and start using paper grocery bags or other environmental friendly bags.

Placing warehouses near retail centers may help in reducing transportation emissions and thus it may also reduce the transportation costs. Simultaneously, we can have green promotion which involves configuring the tools of promotion, such as advertising, marketing materials, and presentations with keeping people, planet and profits in mind. To attract the consumers, product packaging should be environmental friendly or carry more information on environment related issues so as to educate the consumers or to increase their level of concern towards the environment. Marketers can also practice the use of eco-label or green label on their products. In addition, to create consumer awareness, viral marketing and other cause-related marketing strategy such as corporate social responsibility strategy should be emphasized through sponsorship of governmental programs (Department of Wildlife, National Park), NGOs programs (WWF), seminars, exhibitions or other green related events. An ongoing awareness campaign is the announcement by the government on Saturday, Sunday and Monday as "no plastic bags days". Marketers can also imitate this campaign by conducting their own campaign on the other remaining days.

The findings in the current study can be used by the policy makers to design a more effective policies and institutional actions to increase environmentally friendly behavior among Malaysian. Although the Malaysian Government has becoming more environmentally conscious and has taken an intensive initiative to become green country including constructing a 15 years (10th, 11th and 12th Malaysia Plan) greening strategy, it is important to allocate more resources to achieve the goal in becoming green country. As suggested by the current study, attitude mediated the relationship between environmental concern and green purchase intention. Thus, proper educational programs and campaigns should start as early as kindergarten level to cultivate people awareness and positive green attitude among the citizens. The cultivated attitude may then flourish into the intention to buy green products. This suggestion is also supported by Chan (2004) in which he found that there is positive influence of education on green purchase intention and thus the suggestion that policy makers need to invest more in raising the eco-educational level of their citizens. Failing to do so will hamper the civilian commitment to green consumption and achievement of nationwide sustainable growth.

There are number of limitations related to this study. The first limitation is related to limited time horizon and therefore, the respondents were only limited to the state of Sabah. Hence, the results may not be used to generalize the Malaysian consumers as a whole. Realizing the fact that intention would reflect actual behavior, thus for future research, a longitudinal study may be appropriate. To accomplish this, it is suggested that the data to be collected at two (2) different point of time to ensure whether intention can be translated into an action or actual behavior. Finally, as this study only

investigated on green products in general, it is suggested that future research should focus on a particular green products such as hybrid car, green service, environmentally friendly papers, etc.

In short, this study has achieved the objectives to investigate the influence of environmental knowledge and concern on green purchase intention among Sabahan consumers, and to identify the role of attitude as mediator. The findings suggested that environmental knowledge and environmental concern were significantly influenced green purchase intention among Sabahan consumers. Thus, the findings of the current study suggest that the more knowledgeable Sabahan consumer regarding environmental issues, the more likely their intention to purchase green product. This concurs with Mostafa (2009) and Chan and Lau (2000) which they highlighted the importance of environmental knowledge in the prediction of green consumer behavior. In addition, this study also suggests that the more concerned Sabahan consumers are towards the environment, the more likely are their intention to purchase green product, which is in line with Lee (2008) whom stresses that environmental concern can be identified as one of the important factors that affect consumers' green purchasing behavior.

Furthermore, this study found that attitude partially mediated the relationship between environmental concern and green purchase intention. As a result, this current study suggests that the more concern Sabahan consumers towards the environment, the more it would influence their attitude, and this attitude may lead to intention to purchase a green product. On the other hand, the findings shows that environmental knowledge did not predicts attitude, thus attitude did not have mediating effects on the relationship between environmental knowledge and green purchase intention. Therefore, the current study suggests that although Sabahan consumers already have environmental knowledge, this knowledge will not influence their attitude. Thus attitude will not mediates or influence their intention to purchase a green product.

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