

## Factors Influencing the Green Purchase Behavior of Penang Environmental Volunteers

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**Abstract:** Consumers have started to realize that their purchasing behavior can cause a huge impact to the environment as there is a worldwide concern on environmental degradation issues such as global warming and pollutions. Green is now in the mainstream of modern businesses. Therefore being socially, responsible by offering green (environmentally friendly) products and services should be the practices of any companies that wish to sustain a competitive advantage in today's business world. This study is to investigate on the factors that would influence the green purchase behavior of Penang's green volunteers who are participating in any environmental related activities and also the importance of these factors in terms of their ranking. About 7 variables were used in this study including social influence, self-identity, ecological affect, environmental label, environmental knowledge, environmental attitude and environmental concern. It is found that social influence, environmental concern, green product knowledge (one dimension in environmental knowledge), specific environmental knowledge (one dimension in environmental knowledge), environmental label and income level are having significant impact to green purchase behavior of green volunteers in terms of their ranking of importance.

**Key words:** Social influence, ecological affect, Penang's green volunteers, environmental label, environmental knowledge, environmental attitude

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### INTRODUCTION

There has been a rising concern on environmental issues worldwide. Today's consumers have started to realize that their purchasing behavior actually can cause a huge impact to the environment. Therefore, being socially responsible by offering environmentally friendly products and services should be a practice of any companies who wish to sustain a competitive advantage in the business world.

Although, Malaysia has undergone tremendous development followed governmental efforts to attract foreign direct investment, the practices of environmental responsible behavior are still low among Malaysian consumers.

An example of the lack of environmental responsible behavior is shown in an article in *Bernama* whereby garbage thrown by Penang (State of Malaysia) residents is the main cause of river pollution in the state. According to a survey which was conducted on line by the global market insight and information group TNS in 2008, on the aspect of eco-friendliness of habits and behaviors only 8% of Malaysian respondents responded they have changed their behavior in a great deal to benefit the environment (Our Green World, 2008).

In addition, about 83% of Malaysian respondents reported online that their views on a company's friendliness to the environment would influence their purchases of products and services (Our Green World, 2008).

Therefore, studying the determinants of consumer's green purchase behavior would definitely benefit green marketers. In addition, through literature review in Malaysian context, gap still existed between environmental knowledge, intention and behavior, even among Malaysian teachers as proven through the study by Said *et al.* (2003). Even though, there was a positive correlation of environmental knowledge with environmental attitude and behavior in the study of Haron *et al.* (2005), the magnitude of the correlation was low. Also, even employees who had a vast knowledge on green products in ISO 14001 certified organizations not necessarily would purchase green products, based on a recent study by Rashid (2009).

Moreover, based on the online survey conducted by TNS in 2008, about 60% of respondents rated the Malaysian natural environment condition as fair or poor (Our Green World, 2008). This means they were aware of the deteriorating natural environment in Malaysia but did not behave in an environmentally friendly manner.

Therefore, the factors that determine and contribute to the green purchase behavior of Malaysian consumers would be worth to find out.

Volunteers who are participating in the environmental related activities are the target of this study due to the common sense that they are the forerunner of environmental protection in this country.

Their activities and involvement in environmental protection works might have an important impact to governmental green policies. Therefore, studying on factors that would influence their green purchase behavior is important to grasp their green purchase behavior and make them the embassy in encouraging others (general public) towards green consumption. Green consumption is a way to achieve sustainable development.

In Malaysia, there are volunteering groups such as Mercy Malaysia (Malaysia Medical Relief Society), MVFRA (Malaysian Volunteer Fire and Rescue Association), MNS (Malaysian Nature Society), MENGO (Malaysian Environmental NGOs) which is a federation of 18 different NGOs concern about the environment, Malaysian AIDS Foundation and others.

They play an active role in rescuing, helping and improving the life of those under-privileged people while others help on educating and conservation of mother nature. Volunteer's environmental activities and movements might have an important impact to government environmental policies.

On the other hand, this group of consumers should have high environmental related knowledge by common sense. This study is intended to add value to the academic knowledge as well as to provide insightful information to green marketers who would like to target this group of consumers.

Many past studies (Akram, 2008; Rahbar, 2008; Farah, 2008; Fong, 2006) were using respondents from the general public who do not necessarily have the love for the environment. Therefore, this study intends to fill the gap by investigating on the factors that would determine the green purchasing behavior of volunteers in Penang who are participating in various environmental related volunteering campaigns (such as saving water, saving nature, involving in recycling, planting trees and providing environmental related educations).

This study also attempts to accomplish two main objectives: to investigate whether social norms (social influence), self-images, ecological affect, environmental label, knowledge (eco-literacy), environmental attitude and environmental concern would influence green purchase behavior of Penang volunteers who are participating in environmental related activities to

examine which of the determining factors as stated above will show the highest influence to green purchase behaviors.

**The Underpinning theory:** The green literature acknowledges two main theories that are popularly applied in the study of green purchase behavior (Baker and Ozaki, 2008; Gupta and Ogden, 2009; Kalafatis *et al.*, 1999). They are theory of reasoned action and theory of planned behavior. However, Lezin (2009)'s Theory of Reasoned Action (TRA) serves as a better theoretical framework for this study.

**Theory of Reasoned Action (TRA):** TRA which is having its origins in social psychology was initially developed by Martin Fishbein in the late 1960s and it was revised by Ajzen and Fishbein (1980). It is worth mentioning that there are two underlying assumptions for TRA in order to better understand this theory. Based on Ding and Ng (2009), the first assumption is that human is rational and will systematically make use of any available information. The second assumption is that human's intention to perform or not to perform a behavior is the immediate antecedent of the action, due to the reason that most social relevance actions are under volitional control. TRA contain four major components.

Their hypothetical relationships are beliefs determine subjective norms and attitude towards behavior which further determine behavioral intention and also, behavior. Attitude towards behavior is the positive or negative evaluation in performing an action by an individual and subjective norm is the perception of an individual on the social expectation on him/her whether or not to perform an action (Ding and Ng, 2009). These two beliefs will determine the behavioral intention which in turn determines the behavior.

The present study is to determine on the important factors that would influence the green purchasing behavior of volunteers in Penang and the ranking in terms of their importance. However, since this is a cross-sectional study and data is only collected at one point of time, it does not make sense to include both behavioral intention and behavior itself in the framework of this study (George, 2004). In addition, Rahbar (2008) has also omitted intention in her study on the influencing factors that determine consumers to buy green or non-green products. Other than subjective norm and attitude toward behavior, this study is also on exploratory basis by adding in other variables into TRA model in order to determine whether these factors will fit well into this TRA model. Hence, this study intends to provide value add in the area of green purchase behavior.

### **Literature review**

**Green purchase behavior:** According to Mostafa (2007), green purchase behavior or environmental friendly buying behavior is the consumption of products that are benevolent/beneficial to the environment, recyclable or conservable, Sensitive/responsive to ecological concerns. The study of green purchase behavior and factors influence on that is commonly investigated in prior researches. Lee (2008), Chan and Lau (2000) and D'Souza *et al.* (2006a) had conducted studies on factors influencing green purchase behavior. For example, Lee (2008) in her study on young Hong Kong consumers' green purchase behavior had used seven variables: environmental attitude, environmental concern, perceived seriousness of environmental problems, perceived environmental responsibility, perceived effectiveness of environmental behavior, concern for self-image in environmental protection and social influence.

On the other hand, Laroche *et al.* (2001) in their study to identify target consumers who were willing to pay more for environmentally friendly products were looking at a different perspective from Lee (2008). Basically, Laroche *et al.* (2001) were examining on the variables of demographic, values, knowledge (eco-literacy), attitude (such as severity of environmental problem) and behaviors (such as considering environmental issue when making a purchase).

Paco and Raposo (2009) in their study on green segmentation of Portuguese consumers market used firstly demographic characteristics environmental variable (such as concern, affect, commitment, ecological consciousness, subjective norms, activism, environmentally friendly behavior, green products buying behavior, information search, willingness to pay, recycling and skepticism towards environmental claims). D'Souza *et al.* (2006b) in their empirical investigation of the influences of multiple factors on the green purchase intentions of customers in Australia had used 6 variables which were corporate perception, product labels, product dimension, environmental regulation, customers' past experience, price and quality perception. It is notable to notice that only in recent years do researchers show interest in the influence of labels on green purchase intentions.

**Social norm/influence:** According to Kalafatis *et al.* (1999), social norm is whether an action should or should not be performed by a respondent in a referent's point of view. Referents could be friends, neighbors not for profit or for profit organizations, teachers, parents, etc. Social influence is a proxy of subjective norm. This study is using friend as referent and this is reflected in the

questionnaire under social influence in the context of this study. Lee (2008)'s finding on social influence as the top predictor of Hong Kong's young consumers purchasing behavior coincides with Kalafatis *et al.* (1999)'s finding that social norms influence the most on UK respondents' intention to buy environmentally friendly products. Kalafatis *et al.* (1999) further concluded that social norm has a direct and significant effect on intention. Lee and Green (1991) state that social norm has a significant impact to behavioral intention:

H<sub>1</sub>: There will be a positive and significant relationship between social influence and green product purchase behavior of Penang volunteers who are participating in environmental related activities

**Self-image:** Self image is the conception one has of oneself. In the study on marketing influence on consumer purchase decision on pro-environmental products, Baker and Ozaki (2008) found pro-environmental self-images was influencing green behaviors. This agrees to Lee (2008)'s finding on concern for self-image as the third predictor of her study on green young consumers' purchasing behavior in Hong Kong:

H<sub>2</sub>: There will be a positive and significant relationship between concern of self-image and green product purchase behavior of Penang volunteers who are participating in environmental related activities

**Ecological affect:** According to Chan and Lau (2000), ecological affect is the degree of emotionality to environmental issues that are possessed by a person. Chan and Lau (2000) found that ecological affect is an important factor for Chinese consumers in their intention to purchase a green product and also their actual green purchase behaviors. Ip (2003) discovered that those respondents who have a strong ecological affect will be more likely to purchase an eco-friendly insecticide.

In addition, Lee (2008) and Baker and Ozaki (2008) also made the similar conclusion on the positive role of emotion in shaping consumers' attitudes, forming decisions and improving recall to brands (Baker and Ozaki, 2008) while Lee (2008) concluded that green purchasing behavior of adolescent consumers in Hong Kong is more likely to be aroused by emotional factor rather than by rational thinking. However, Chan (2004) in his study found out that Chinese consumers are pragmatic oriented and only appeals to advertisements which are relevance to their everyday lives. This finding causes to conclude that advertisers in China are advised

to focus on rational appeals instead of emotional appeals in order to convince China consumers to consume green products to enhance their enjoyment of life. Hence, Chan (2004)'s finding clearly contradicts to the findings by Lee (2008), Baker and Ozaki (2008) and Hartmann and Ibanez (2006).

This study, therefore is using ecological affect as of the independent variables as Chan and Lau (2000) was also using ecological affect as independent variable in their study on green purchase behavior:

H<sub>3</sub>: There will be a positive and significant relationship between ecological affect and green product purchase behavior of Penang volunteers who are participating in environmental related activities

**Environmental label:** D'Souza *et al.* (2006a) found out the consumers' perception of green products did not influence by criteria such as packaging, label and ingredient of a product. The important finding from D'Souza *et al.* (2006b) was that green consumers would rely more on their personal experience in using the product rather than evaluate a green product base on marketers' provided information. Interestingly, this finding however contradicts to D'Souza, Taghian and Lamb's finding they found that consumers are getting environmental information from labels before deciding to purchase a green product.

The finding from D'Souza *et al.* (2006a) was if product is lower in quality, consumers would not have intention to buy green products even though they were always reading labels. Another, finding was if product is more expensive, consumers might have intention to buy green products and them also always reading labels. Therefore, D'Souza *et al.* (2006b) concluded from their study that consumers were not compromised to lower product quality.

However, Rashid (2009) in his study which introduced eco label as a separate moderating variable found that eco label is an important factor that would enable consumers to make the right purchase choice if faced with a situation that required their consideration of the environmental impact on a product that they wish to purchase.

Rahbar (2008) could not find a significant relationship between environmental label and green purchase behavior:

H<sub>4</sub>: There will be a positive and significant relationship between environmental label and green product purchase behavior of Penang volunteers who are participating in environmental related activities

**Knowledge (eco-literacy):** All phases in buying decision processes can be influenced by consumers knowledge. According to Getzner and Grabner-Krauter (2004), the assumption that consumers environmental knowledge or eco-literacy is a significant predictor of environmentally friendly behavior has been empirically supported in several studies (Vining and Ebreo, 1990; Chan, 1999).

Chan and Lau (2000) were using ecological knowledge as one of their independent variables as an antecedents of green purchases in China. The result shown Chinese people with more ecological knowledge had a stronger intention to involve in green purchasing which were more likely to conduct green purchase (Chan and Lau, 2000). However, Laroche *et al.* (2001) found that eco-literacy was not proper variable in predicting consumers' willingness to pay more for environmental friendly products. Laroche *et al.* (2001) were using eco-literacy to measure how much respondents knew about environmental issues.

Environmental knowledge although was significant in differentiating the cluster in Paco and Raposo (2009)'s study but did not contribute to green purchase behavior. Tadjewski and Tsukamoto (2006) in their qualitative study on green consumer behavior also found that their respondents despite having knowledge on life-cycle analysis failed to shown it in their daily shopping behavior. In addition, Rahbar (2008) could not find a significant relationship between environmental knowledge and green purchase behavior.

However, interestingly in the study on Malaysian's environmental knowledge, Haron *et al.* (2005) concluded that knowledge correlates positively with environmental attitude, behavior and participation although, the magnitude of the correlation was low:

H<sub>5</sub>: There will be a positive and significant relationship between environmental knowledge and green product purchase behavior of Penang volunteers who are participating in environmental related activities

**Environmental attitude:** Lee (2008) defined environmental attitude as the individuals value judgment of environmental protection which taps the individuals' cognitive assessment of the value of environmental protection. Environmental attitude was not a strong determinant of young consumers' purchasing behavior in Hong Kong as reflected from the survey result that it only ranked second last among other variables (Lee 2008). Hence, Kaiser *et al.* (1999) stated that environmental attitude is proved to relate to environmental behavior in Western literature. Cleveland *et al.* (2005) also had found

a low relation between environmental friendly attitudes and green behaviors. This is contradictory to the finding by Follows and Jobber (2000) that relationship did exist from value to attitude to purchase intention and to purchase behavior.

Paco and Raposo (2009) concluded that consumers were more likely to buy green products if they were more closely involved with the environment. In addition, Paco and Raposo (2009) further stated that attitude although not necessarily used by customers as a base for their green purchase decisions but still could impose a strong influence on their green purchases.

However by common sense, environmental attitude of green volunteers should be motivating them to buy green products:

H<sub>6</sub>: There will be a positive and significant relationship between environmental attitude and green product purchase behavior of Penang volunteers who are participating in environmental related activities

**Environmental concern:** Environmental concern is the degree of emotionality, level of knowledge and readiness to change behavior (Maloney *et al.*, 1975). Lee (2008) stated that environmental concern as the degree of emotional involvement in environmental issues. According to Said *et al.* (2003), environmental concern refers to the belief, stance and degree of concern an individual holds towards the environment. In conclusion, environmental concern is involving emotionality towards environmental related issues.

Prior studies from researchers (Antil 1984; Roberts, 1991, 1995; Roberts and Bacon, 1997; Van Liere and Dunlap, 1981) have proved a positive correlation between environmental concern and green behavior.

In addition, Paco and Raposo (2009) assumed that Portuguese consumers although, supporting the environmental improvement policies but did not translate their concerns into actions. On the contrary, Lee (2008) found a significant relationship between environmental concern and green purchasing behavior among Hong Kong's adolescent consumers, in which environmental concern was ranked as the second top predictor.

This study investigate on green purchase behavior of environmental related volunteers in Penang, therefore the researcher would be eager to know whether green volunteers will manifest their environmental concern into their daily purchasing behaviors:

H<sub>7</sub>: There will be a positive and significant relationship between environmental concern and green product purchase behavior of Penang volunteers who are participating in environmental related activities

## MATERIALS AND METHODS

**Sampling procedures and data collection:** The population targeted for this study consisted of all Penang's volunteers who participated in environmental related activities regardless of whether they were attached to any organizations. Snowball sampling was used for the purpose of this study. Through snowball sampling method, the researcher makes the initial contact with a small group of people who are relevant to the research topic and then uses these to establish contacts with others (Bryman and Bell, 2007). It was more suitable for this study since, the intended respondents were environmental related volunteers.

Researchers were making an initial contact with a few Penang volunteers who further helped the researcher to make contact with more related respondents. The sample size for this study was planned to be 300 respondents which was more than adequate for a total of nine variables in this study. According to Sekaran (2009), sample size between 30-500 is already adequate for most of the research. Primary data was collected through the distribution of questionnaires with reference to the hypotheses formulated earlier. A pilot testing of questionnaire on six willing targeted respondents were conducted to ensure respondents understand on what were asked (items) in the questionnaire. The outcome was satisfactory.

A list containing all relevant environmental related groups was obtaining through internet search and also through information provided by lecturers, friends and colleagues. A letter (with purpose and objective of the study) was sent to each of these environmental related groups to ask for consent to approach their respective members for the purpose of answering the self-administered questionnaire.

**Measures:** The questionnaire was divided into eight sections. The first section (Section A) of the questionnaire was on respondents demographic particulars that were adapted from the study of Fong (2006) on environmental orientation of consumers in Malaysia.

The second and third sections (Sections B and C) of the questionnaire was measuring the social influence and the concern of self-image on respondents, based on a 5-point Likert scale (1 = not at all, 5 = very much) which were adopted from Lee (2008) in her study on the green purchasing behavior of young consumers in Hong Kong.

The fourth section (Section D) of the questionnaire was measuring on the ecological affect of respondents based on a 5-point Likert scale (1 = strongly disagree, 5 =

strongly agree). It contained five questions which were taken from the questionnaire used by Chan and Lau (2000).

The 5 and 6th sections (Section E and F) of the questionnaire was measuring on the influence of environmental label on respondents and the respondents' environmental knowledge based on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) and (1 = no knowledge, 5 = very knowledgeable) for Section F. A logo was provided in section E and respondents were required to answer on 6 questions based on the logo. These sections of questions were adapted from the questionnaire used by Rahbar (2008).

The 7th-9th section (Section G, H and I) of the questionnaire were measuring on the respondents' environmental attitude, the respondents' environmental concern and respondents' green purchasing behavior based on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) and (1 = never, 5 = always).

**RESULTS AND DISCUSSION**

A preliminary analysis of the data reveals that the sample is composed of about 77% aged between 21-40 years old in which 61% of them were female. In terms of ethnicity about 78% was Chinese, 13% was Malay and 9% was Indian. The distribution of the respondents in terms of marital status was quite equal in which 50.5% was single about 80% were from educational group of at least Bachelor degree and above. For monthly gross personal income about 48% were earning between RM1501 to RM4500 and 39% were earning at least RM4501.

**Factor analysis:** Factor analysis which is one type of multivariate analysis is used to define the underlying structure called factors among the variables in the analysis (Hair *et al.*, 2007). For the purpose of this study, factor analysis was used in 7 variables of present study. The result of initial (first run of) factor analysis on seven independent variables showed KMO was 0.85 and significance level of Bartlett's test of sphericity was 0.00. This was considered satisfactory as it fulfilled the criteria of KMO >0.5 (meaned factor analysis was suitable to be used for this data analysis) and significance <0.05 (which indicated sufficient correlations existed among the variables to proceed for factor analysis) (Hair *et al.*, 2007).

The result is shown in Table 1. All variables' items were grouped under the first component. The results of total variance, KMO's values, Barlett's test of sphericity and also result of reliability tests are shown in Table 1.

Table 1: Results of factor analysis

Variables	KMO	Bartlett's test of sphericity	Total variance explained	Cronbach's alpha
Environmental label	-	-	-	0.97
Social Influence	-	-	-	0.89
Ecological affect	0.84	0.00	68.53%	0.77
Self-identity	-	-	-	0.90
Environmental concern	-	-	-	0.78
Green purchase behavior	-	-	-	0.84

**Factor analysis on environmental knowledge and environmental attitude:** The factor analysis on 15 items measuring environmental knowledge was carried out using Varimax rotation with Kaiser normalization and principal component analysis. These 15 items were initially grouped under four different components. After re-ran the factor analysis as some items were not meeting the criteria of loading >0.5 and cross loading <0.35, it resulted in three different components in total.

Total variance explained was 68.53% with KMO's value 0.84. Barlett's test of sphericity was significant (p<0.01). The range of loading for each of the loaded items was from 0.51-0.85. Three items were omitted. Factor loading 1, 2 and 3 were renamed by researchers as specific environmental knowledge, green products knowledge and waste related environment knowledge, representatively. The factor analysis on seven items measuring environmental attitude were grouped under two different components. Total variance explained was 68.53% with KMO's value 0.84. Barlett's test of sphericity was significant (p<0.01).

The range of loading for each of these five items was from 0.70-0.88. Three items which were related to the protection on environment were renamed as environmental protection and factor loading 2 with two items which were related to awareness on environment were renamed environmental awareness.

**Descriptive analysis:** Descriptive analysis was able to provide researcher with an overview of the respondents perception of the variables involved in this study through mean and standard deviation information (Table 2).

**Multiple regression analysis:** Multiple regression analysis was used to study on how a dependent variable was predicted by two or more independent variables. Overall, multiple regression analysis was showing a R<sup>2</sup> of 0.40 in which about 40% of dependent variable could be explained by all the independent variables in this study. It was significant at p<0.01. This model was having Durbin-watson of 1.87. The purpose of Durbin-watson test is to see whether the assumption on independent observation is met and it should be 1.5-2.5 as a rule of thumb.

Table 2: Summary of the descriptive analysis of the studied variables

Variables	Mean	S.D	The results represent that respondents ....
Environmental label	2.32	1.18	Not well aware of the environmental label (Malaysia's Best)
Social influence	2.96	0.98	Friend does play a moderate role in influencing respondents
Specific environmental knowledge	4.19	0.43	Were quite knowledgeable about environmental issues
Ecological affect	4.33	0.43	Emotionally involved in the environmental issues
Environmental protection	4.75	0.38	Think environmental protection was meaningful and it should be promoted
Self-identity	4.48	0.46	Were proud of being a green person
Environmental concern	4.28	0.42	Felt that Penang environment was a major concern and they worried about worsening environmental quality in Penang
Environmental awareness	4.72	0.42	Felt it was essential to promote green living in Penang and more works of environmental protection were needed in Penang
Green product knowledge	3.98	0.61	Have quite satisfactory knowledge on the areas of unleaded petrol, minimum packaging materials and ozone friendly aerosols
Waste related environmental knowledge	3.98	0.61	Have a quite satisfactory level of knowledge in the aspects of waste management and hazardous waste
Green purchase behavior	3.28	0.79	Did not frequently buy green products in their daily life

**Testing of hypotheses:** The result of regression analysis showed that social influence was contributing positively and significantly to green purchase behavior of Penang green volunteers ( $\beta = 0.38, p < 0.01$ ). Self identity, although have a positive influence to green purchase behavior but the relationship was insignificant ( $\beta = 0.11, p > 0.05$ ). This indicated concern of self images (self identity) of Penang green volunteers did not reflected in their green purchase behavior.

Ecological affect surprisingly has a negative relationship with green purchase behavior but the relationship was insignificant ( $\beta = -0.05, p > 0.05$ ). The result of the regression analysis indicate that environmental label and environmental concern has a positive and significant relationship to green purchase behavior of Penang green volunteers ( $\beta = 0.13, p < 0.01$  and  $\beta = 0.17, p < 0.01$ ). In terms of the environmental knowledge, two dimensions (specific environmental knowledge, green product knowledge) are found to have a positive and significant relationship with green purchase behavior ( $\beta = 0.14, p < 0.01$  and  $\beta = 0.16, p < 0.01$ ). From this analysis, apparently volunteers who had a high specific environmental knowledge and high green product knowledge did engage more in green purchase behavior. Therefore, H5a and H5b are supported.

The finding also showed that waste related environmental knowledge (third dimension) has a positive but insignificant relationship with green purchase behavior of Penang green volunteers ( $\beta = 0.01, p > 0.05$ ). Based on the regression analysis results all two dimension of environmental attitude (environmental protection and environmental awareness) have an insignificant relationship with green purchase behavior of Penang green volunteers ( $\beta = 0.03, p > 0.05$  and  $\beta = -0.13, p < 0.05$ ). Therefore, H6a and H6b were rejected.

This indicate that environmental protection and environmental awareness were not an important factor that would influence Penang green volunteers to buy green products.

This study determines the important factors that would influence the green purchasing behavior of volunteers in Penang and the ranking in terms of their importance. The social influence is the most important factor (in terms of the ranking of importance) which influences the green purchase behavior of Penang green volunteers. This agrees with Lee (2008)'s finding in which peer influence was the highest predictor of green purchase behavior for Hong Kong adolescent consumers.

Also based on Baker and Ozaki (2008), social norms (social influence) are important in motivating ecologically responsible behavior. Based on their study, they declare that social norm has a strong link to environmental friendly behavior (buying green products). In addition, social norm was found by Kalafatis *et al.* (1999) to be the only significant predictor of UK respondents' intention to buy environmentally friendly products.

In the present study, self-identity is not an important factor that would influence green products purchase behavior among Penang green volunteers. This finding is clearly contradicting to the findings by Lee (2008)'s and Baker and Ozaki (2008) who believe as an important influencing independent variable that would predict the green purchase behavior. One possible explanation to this disagreement in finding is the differences in the respondents group. Lee (2008)'s respondents were adolescent consumers with the mean age of 14.35 years. However, most of the respondents in this study were Penang green volunteers who majority aged between 21-40 years old in their adulthood stage.

According to Shaffer (1994) human adolescence stage is a stage which bridges childhood and adulthood and it is strongly characterized by a need for self-identity, self focus, acceptance and approval. Furthermore, projection of good image as an environmentally responsible person is particularly motivating adolescent consumers who are still in the stage of searching for approval and acceptance from others (Lee, 2008). Comparing to adolescent consumers, green volunteer respondents in this study are

already in their adulthood and therefore, the need for self-identity does not have a significant influence in their green purchase behavior.

The result of this study indicates that Penang green volunteers have a high sense of ecological affect (mean = 4.33) but this is not translated into their green purchase behavior. Possible reasons might due to unavailability, lacking distribution channels and expensiveness of green products and perception that purchasing green products would not help in improving the environment condition (Yam-Tang and Chan, 1998).

The result of the analysis shows environmental label has a positive and significant relationship with green purchase behavior. This finding consistent with D'Souza *et al.* (2006a, b)'s finding in which consumers are getting environmental information from labels before deciding to purchase a green product. In addition, Rashid (2009) found that eco label is an important factor that would enable consumers to make the right purchase choice if faced with a situation that required their consideration of the environmental impact on a product that they wish to purchase.

This finding also agrees with Thorgersen (2002)'s view in which eco-label is necessary and valuable in helping consumers to make purchase decisions. Another variable of current study is environmental knowledge that was divided into three different dimensions (specific environmental knowledge, green product knowledge and waste related environmental knowledge). These dimensions' grouping are very different from the grouping used by Rashid (2009) in his study on awareness of eco-label among employees in ISO 14001 certified organizations. In his study, Rashid (2009) had three different groupings on environmental knowledge which were knowledge of green products, knowledge of environmental issues and concrete knowledge.

The findings on three corollary hypotheses (H5a and H5b accepted and H5c rejected) make researcher (Table 3) to conclude that environmental knowledge in overall has a positive relationship with green purchase behavior and is quite an important factor that would influence the green purchase behavior (Table 4). This finding also coincides with the finding by Haron *et al.* (2005), Chan (1999) and Vining and Ebreo (1990) in which they did find a positive correlation of environmental knowledge with environmental attitude, behavior.

The result of the analysis shows that environmental protection and awareness have an insignificant relationship with green purchase behavior (Table 4). According to Baker and Ozaki (2008), environmental consciousness does not necessarily lead to pro-environmental behaviors in general or in buying

Table 3: Regression analysis for testing hypotheses

Variables	Std. $\beta$
Social influence	0.38**
Self-identity/self-image	0.11
Ecological affect	-0.05
Environmental label	0.13**
Specific environmental knowledge	0.14**
Green product knowledge	0.16**
Waste related environmental knowledge	0.01
Environmental protection	0.03
Environmental awareness	-0.13*
Environmental concern	0.17**
R <sup>2</sup>	0.40
F-value	12.73**

\* p<0.05, \*\* p<0.01

Table 4: The ranking of important factors that influence the green purchasing behavior

Ranks	Variables
1	Social influence
2	Environmental concern
3	Green product knowledge
4	Specific environmental knowledge
5	Trust and awareness on eco-label

behaviors in specific. Baker and Ozaki (2008) define this as value-action gap. Based on Ajzen (1991), people will only comply when the pro-environmental behavior aligns with self-interest. Baker and Ozaki (2008) also mentioned in their study that what is a good idea to a person is not a good predictor on what he or she will actually do. This is especially true in the aspect of environmental related values and behaviors. In summary having a good environmental attitude not necessarily would translate into green purchase behavior, even among green volunteers.

The result of multiple regression analysis indicates a positive and significant relationship between environmental concern and green purchase behavior among Penang green volunteers. This shows environmental concern did translate into green respondents' daily green buying behavior. Lee (2008) also found a significant relationship between environmental concern and green purchasing behavior. Moreover, prior studies such as conducted by Antil (1984), Roberts (1991), Sheltzer *et al.* (1991) and Shabecoff (1993) had suggested, it is more likely for consumers to engage in eco-friendly consumer behavior if they have a high level of environmental concern.

### Implications of the study

**Implications to academic knowledge:** This study is using Theory of Reasoned Action (TRA) as the theoretical framework. From here, it is confirmed social influence (this study is using friends' influence) can be a proxy for subjective norm. Moreover, social influence is found to be the highest predictor of green purchase behavior of Penang green volunteers in terms of ranking based on this



study. Based on TRA, attitude toward behavior is the expected outcome of one's behavior and the desirability of the specific outcome (Kalafatis *et al.*, 1999). This study has found out that attitude towards behavior (or attitude towards environment) is not single dimensional. It is two dimensional (environmental protection and awareness). Rahbar (2008) also made the same comment that attitude is not single dimensional but multi-dimensional instead. This finding certainly contributes to the theoretical knowledge on green related attitude since, two researchers have discovered that green related attitude is not single dimensional as proposed by TRA.

Lastly as mentioned, previous researchers add in other variables such as concern of self-image, ecological affect, environmental label, environmental knowledge and environmental concern into TRA in order to determine whether these factors will fit well into TRA model in predicting environmental friendly purchasing behavior among Penang green volunteers. From the result of this study, it is found that environmental label, environmental concern, green product knowledge and specific environmental knowledge are significant in determining green purchase behavior of Penang's green related volunteers.

Therefore, those academicians who are interested to conduct future studies on green purchase behavior of green volunteers might consider include these elements into the TRA framework as it has proven to fit well into the research framework.

**Implications to green industries:** The most important implication to those industries involved in green related products is eco-label can serve as an essential marketing tool in promoting green consumption among green volunteers. This is due to eco label is found to have a positive and significant influence towards green volunteers' purchase behavior. Also, due to social influence can exert a significant impact (since, this is the most important factor), green marketers should be emphasizing more on viral marketing or word-of-mouth marketing. According to crucial marketing, viral marketing is defined as marketing phenomenon that facilitates and encourages people to pass along a marketing message. This method of marketing is well suited for green volunteers whose purchasing behaviors are highly influenced by social influence (subjective norm).

Since, environmental concern is found to be important in influencing green purchase behavior of green volunteers, it is suggested for the green marketers to promote their green products based on cause-related marketing method other than viral marketing method as mentioned above. One example of successful cause-

related marketing in raising the awareness amongst its customers in tackling global climate change is practiced by Scottish Power which has helped in positioning itself as an energy supplier who is environmentally conscious. This has helped Scottish power in acquiring and retaining its customers. It has done this through sponsorship and participation in green related events such as exhibitions and it also has its own green energy website (CSR Europe, 2010).

Therefore, a green marketer can positively differentiate itself from its competitors through the sponsorship of green related events to show its commitment towards community, social and environment wellness. This would help to expose and promote their brands of green products to consumers, especially those from green volunteering groups to be the loyal consumers of their green products.

**Implications to governmental green policy:** The implication of this study to governmental policy is providing a few guidelines for government to formulate the green policies such as encouraging car-pooling and the use of public transportation amongst working people, providing promotional incentives to those green products manufacturers who are truly green in their manufacturing processes, encouraging public to recycle and buy only products made from recycled materials etc.

Firstly in terms of environmental knowledge, it is found that green product knowledge and specific environmental knowledge are significantly influencing the green purchase behavior of Penang green volunteers. Therefore, government can take this into the consideration of environmental related messages and advertisements that it posts in media. Any environmental related knowledge or education that government sends to the general public should be more specific in order to maximize its effect and to facilitate environmentally friendly purchasing behavior, especially among green related volunteers.

Researchers believe that once the public is having a good environmental knowledge and a good understanding on how they can help to improve the environment they will be more motivating to buy green products or products that made from recycled materials.

Secondly, government can raise campaigns to promote public awareness of eco-labels as it is proven in this study that awareness and trustfulness of eco-labels can exert a significant influence in green purchase behavior. With the increase awareness on eco labels, it would help in promoting green consumption among green volunteers specifically and public generally. However, government should be monitoring on the credibility and

trustfulness of messages carried in eco-labels. Thirdly, as the result of this study shows that social influence is the most important factor that influence green purchase behavior of green volunteers, government can consider to exert word-of-mouth campaigns to encourage public to involve in green consumption. Green consumption is a way to promote for a greener and healthier living for sustainable development.

**Limitations:** There are a few limitations related to this study. Firstly, the main limitation is the green volunteers only limited to Penang state. Therefore, it may not be appropriate to generalize finding to all green volunteers in Malaysia. Thus, it is suggested that future study to cover other states in Malaysia for generalization purpose.

Secondly, this study is based on cross-sectional design and data only collected at one point of time therefore, it is not appropriate to include intention in the TRA framework. According to George (2004), intentions reflect future behavior while reports of actual behavior reflect what happened in the past.

### CONCLUSION

In summary, this study has achieved its objectives of investigating on factors that would influence the green purchase behavior of green volunteers and also on the ranking of importance of these factors. It is found that social influence (the proxy of subjective norm) to be the top predictor of green purchase behavior among green volunteers of Penang followed by environmental concern, green product knowledge, specific environmental knowledge and environmental label. Other variables are found to be not significant in influencing green volunteer's environmental friendly purchasing behavior. However, it is concluded that Penang's green volunteers are generally have a satisfactory level of environmental knowledge and it is translated into their green purchasing behavior (with the exception of waste related environmental knowledge). Overall, green respondents in this study have a high level of environmental attitude, self-identity and ecological affect towards environment.

### RECOMMENDATIONS

It would be more appropriate if this study is to conduct based on longitudinal method in which data will be collected at least at two different points of time. With longitudinal studies, the green purchase intention and actual green purchase behavior can be traced at the different point of time to investigate whether intention has been translated into behavior.

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