

Environmentally Conscious Behavior among Malaysian Consumers: An Empirical Analysis

*(Tingkah Laku Keprihatinan Terhadap Alam Sekitar dalam Kalangan Pengguna Malaysia:
Satu Analisis Empirikal)*

Zuraidah Ramly

Nor Hashima Hashim

(Faculty of Business Management, Universiti Teknologi MARA Shah Alam)

Wan Kalthom Yahya

Siti Aishah Mohamad

(Faculty of Business Management, Universiti Teknologi MARA Pahang)

ABSTRACT

This paper aims to investigate the influence of demographic and psychographic variables on environmentally conscious consumer behavior (ECCB) in the context of Malaysian consumers. A survey was developed and administered, generating a total sample of 319 respondents across the country. The preliminary results indicated that all of the variables examined were significantly correlated to ECCB, except for income. Later, the analysis from the regression highlighted that only age, gender and perceived consumer effectiveness (PCE) were significant predictors to ECCB. The findings confirmed that, in terms of psychographic variables, PCE has been proven to be more accurate and significant determinant than environmental concern (EC) for segmenting and explaining different segments and characteristics of pro-environmental behavior. These findings may assist Malaysian policy makers in formulating actionable decisions related to environmental education and protection. The finding also allows marketers to use marketing and awareness-raising campaigns to encourage consumers to choose environmental friendly products.

ABSTRAK

Kajian ini dijalankan bertujuan untuk mengkaji pengaruh faktor demografi dan psikografi ke atas tingkah laku keprihatinan pengguna terhadap ekologi (ECCB) dalam konteks pengguna Malaysia. Satu tinjauan telah dilakukan terhadap sampel kajian yang berjumlah 319 orang pengguna di seluruh negara. Hasil awal kajian mendapati semua faktor mempunyai hubungan yang signifikan terhadap ECCB, kecuali pendapatan. Kemudian, analisis daripada regresi menunjukkan hanya faktor umur, jantina dan keberkesanan kesedaran pengguna (PCE) merupakan petunjuk yang signifikan terhadap ECCB. Hasil dapatan mengesahkan bahawa bagi faktor psikografi, PCE telah terbukti lebih tepat dan signifikan daripada keprihatinan terhadap alam sekitar (EC) untuk segmentasi dan menerangkan segmen yang berbeza serta ciri-ciri tingkah laku pro alam sekitar. Hasil kajian ini dapat membantu penggubal dasar di Malaysia untuk membuat keputusan yang berkaitan dengan pendidikan dan perlindungan alam sekitar. Hasil kajian ini juga membolehkan pihak yang terlibat dalam pemasaran untuk menggunakan strategi pemasaran dan kempen meningkatkan kesedaran untuk menggalakkan pengguna memilih produk mesra alam

Keywords : Conscious Behavior; Malaysian Consumers

INTRODUCTION

Today, environmental concern has become a dominant phenomenon around the world as a consequence of a paradigmatic shift in attitudes towards the environment and society. In a globalized economy, this shift indicates that in order for organizations and firms to compete effectively in a competitive environment, they need to clearly define business practices reflect public interest. Dahlsrud (2007) contends that the relationship between organizations and the society involves a commitment to social concerns and integrating them into business

operations to contribute to a better society. Therefore, organizations must acknowledge the expectations and growing demand of the society for more ethically responsible business practices. An organization's ethical behaviors impact the manner way customers behave towards the organization (Creyer & Ross 1997; Nebenzahl, Jaffe & Kavak 2001). Profit driven companies are usually motivated to adopt the concept of green marketing in their business activities, provided consumers demonstrate strong environmental attitudes that translate into purchase commitment.

This has led many companies to be more socially responsive in addressing pollution and waste disposal by developing environmentally friendly packaging and keeping in line with the environmental movement. As a result, this has influenced the importance of the ecologically conscious consumer. Essentially, this group of consumers believes that, as individuals, they have significant opportunities to influence change and feel empowered to assist in the resolution of environmental problems. Research indicates that consumers are likely to pay more for environmentally friendly products; change their shopping habits to help protect the environment; and have a propensity to buy products only from companies with a reputation for environmental and social responsibility (Creyer & Ross 1997). Studies have demonstrated that consumers in the US and Western Europe have grown more environmentally-conscious in the past decade (Curlo 1999). There are also clear signs that green consumerism has started to emerge in the Asian regions (Gura'u & Ranchhod 2005). This is attributed to the increasing concern among Asian societies about alarming environmental issues and increasing willingness to act on these concerns (Harris 2006); and the rapidly growing Asian economies that have led to a vigorous rise of financially-empowered consumers across Asia, who are willing to spend more than previous generations (Li & Su 2007).

Similarly, environmental issues are beginning to catch the interest of policy makers and Malaysian society. The government has urged private sectors to include their environmental management activities in annual reports and take a leadership stance in driving the environmental movement forward. As suggested earlier, the role of business and the public are intrinsically linked in terms of environmental issues. The public plays a vital role in environmentally responsible consumption decisions that address environmental problems and issues. Past studies in Western cultures have found gender differences in environment perceptions, values and actions (Agarwal 2000).

Hence, this paper attempts to identify the differences in consumer behavior and attitudes towards environmentally conscious behavior in terms of demographic variables (age, gender, income and education). Generally, this study contributes to a better understanding of perceived consumer effectiveness and environmental concerns of local consumers. Specifically, the research findings emphasize the factors that influence the behavior and attitudes relating to environmentally conscious consumer behavior (see Figure 1). This could assist Malaysian policy makers to mainstream their decision-making processes and to formulate actionable environmental education and protection. It can also drive marketers to use marketing and awareness-raising campaigns to encourage consumers to choose environmental friendly products.

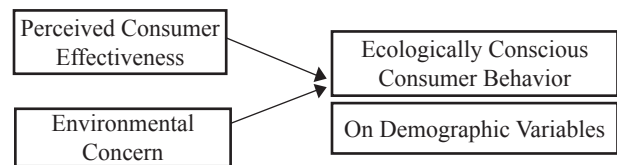


FIGURE 1. Proposed conceptual framework

The remainder of the paper is organized as follows. The second section reviews relevant literature. This is followed by a section on methodology and results and discussions. The last section presents the conclusion and implications.

LITERATURE REVIEW

Individuals have different values, attitudes and opinions with respect to environmental issues. Even though some individuals view environmental issues as the responsibility of the government, others show overwhelming support for, and concern about, environmental sustainability and maintaining an ecological balance. These individuals hold the view that everyone in society has a moral responsibility to adopt environmentally responsible behaviors. Without a doubt, human behavior leaves a colossal imprint on the global environment. According to Saunders (2003) and Oskamp (2000), today's environmental issues and challenges are a direct result of human actions that require behavioral solutions. Thus, this paper aims to examine the influence of demographics (age, gender, income and education), psychological factors (perceived consumer effectiveness (PCE), and environmental concern (EC) in relation to environmentally conscious consumer behavior (ECCB).

ENVIRONMENTAL CONCERN

EC refers to an effective attribute that represents a person's worries, compassion, likes and dislikes about the environment (Yeung 2005). Concern over the environment has evolved over time. In the 21st century, environmental issues have been used as a source of competitive advantage in business and politics, individual and societal concerns. Age, educational attainment, political ideology, ethnicity, gender and value orientation have been found to have robust and consistent effects on environmental concerns over time across different surveys and samples (Xiao & McCright 2007). Indeed, the relationship between attitudes and behavior is one that has been explored in a variety of contexts. For instance, Bang et al. (2000) found that consumers who were more concerned about the environment expressed more willingness to pay more for renewable energy than those who were less concerned.

ECs and consumer demand for environmentally friendly products have led to the emergence of a new marketing concept, known as green marketing. Peattie and Charter (1997) conceptualized green marketing as the holistic management process for recognizing, anticipating and fulfilling the customer's and society's needs in a beneficial and sustainable way. Since the birth of the green marketing concept has caught the interest of academics, a number of studies have attempted to acknowledge demographic variables that shape the green consumer's profile. Consequently, prior research suggested that younger individuals were likely to be more sensitive to green marketing issues. Those who grew up in a period where EC was a significant issue at some level were more likely to be sensitive towards green marketing issues. Surprisingly, over the last two decades, this trend has been reversed and several studies identified the green consumer as being older than average (D'Souza et al. 2007; Jain & Kaur 2006; Roberts 1996a, 1996b; Samdahl & Robertson 1989). Despite the numerous researches investigating the age effect in portraying the green consumer, the results of age-based investigations remain unconvincing. For example, Kinnear et al. (1974) and McEvoy (1972) explored age in relation to green attitudes and behavior and found insignificant relationships. Similarly, others have found the relationship to be significant and negatively correlated with environmental sensitivity and/or behavior as predicted (Anderson et al. 1974; Tognacci et al. 1972; Van Liere & Dunlap 1981; Zimmer et al. 1994). Meanwhile, Roberts (1996a), Samdahl and Robertson (1989), and Roberts and Bacon (1997) discovered the relationship to be significant and positive.

The development of unique sex roles, skills and attitudes has led most researchers to argue that women are more likely to have attitudes consistent with the green movement. Straughan and Roberts (1999) stressed that as a result of social development and sex roles differences, women tend to be more careful in considering the impact of their actions on others. Also, several existing studies have demonstrated that women are more concerned about environmental issues than men (Mostafa 2007), while Zelezny, Chua and Alrich (2000) ascertained that the display of gender difference in environmental concern could begin as early as primary-school age.

Income, another demographic variable, has always been perceived to have a positive relationship with environmental sensitivity, wherein those with higher income levels and support green causes and favor green products are able to tolerate the price increase in green products (Bang et al. 2000). Conversely, Roberts (1996a) and Samdahl and Robertson (1989) find a negative relationship between income and ECs.

PERCEIVED CONSUMER EFFECTIVENESS

PCE refers to the extent to which individuals believe that their actions make a difference in solving a problem

(Weiner & Doescher 1991). According to Berger and Corbin (1992), attitude is defined as an evaluation of an individual's beliefs or feelings about an issue, and PCE refers to a self-evaluation in the context of an environmental issue, for instance, pollution abatement. PCE was found to have a direct and positive relationship with environmental attitudes (Kim & Choi 2005), such that people who had demonstrated higher PCE levels were more likely to be environmentally concerned than those with lower levels of PCE. Past studies reveal that consumers' attitudes and responses to environmental concerns stem from their own beliefs that individuals have the power to significantly influence the outcome of environmental problems (Kinnear 1974; Webster & Frederick 1975; Weiner & Doescher 1991; Berger & Corbin 1992; Roberts 1995, 1996a; Roberts & Bacon 1997).

Therefore, PCE was developed as a measure of attitude and was consequently modeled as a direct predictor of environmentally conscious behavior (Roberts 1996a). Socially conscious consumers strongly feel that they can do something about the environmental issues and, thus, proactively reconsider the social impact of their purchase behaviors (Webster & Frederick 1975). Weiner and Doescher (1991) and Berger and Corbin (1992) found that consumers' levels of PCE affect their likelihood of performing ecologically conscious consumer behaviors. Moreover, findings have been fairly conclusive that PCE is positively correlated with ecologically conscious consumer behavior (ECCB). In addition, a study by Roberts (1996a) on PCE indicated that PCE is the single strongest predictor of ECCB, surpassing all other demographic and psychographic correlates examined. Ellen et al. (1991) report that PCE is a significant determinant in the decision to purchase ecologically safe products; to engage in recycling; and make contributions to environmental groups.

Straughan and Roberts's (1999) study on the efficacy of PCE establish it as a strong attitudinal variable to predict ECCB, which explained 33% of the variation in ECCB. The finding was consistent with an earlier discovery by Roberts (1996a) that demonstrates 32.8% of the variance in ECCB can be explained by PCE. This provides greater insight into the influence of PCE on ECCB. In both studies, PCE is measured as one of the attitudinal variables in predicting behavior and found to be a better predictor than ECs in predicting ECCB.

ENVIRONMENTALLY CONSCIOUS CONSUMER BEHAVIOR

Specific demographic groups with particular behavioral qualities and attitudes engage in sustainability in varied ways (A.Gilg, Stewart & Nicholas 2005). Antil (1984) suggests that individuals with a higher level of EC would be more likely to engage in ECCB. Similarly, Arcury (1990), Peattie (1995), and Bazoche, Deola and Soler (2008) reveal that knowledge, information, and attitudes are important for changing human actions

that affect the environment. Companies promoting environmental awareness believe information will lead to increasing environmental knowledge, thus, changing attitudes and buying behaviors. Roberts (1997) asserts that environmental attitudes influence ECCB. Tikka, Kuitunen and Tynys (2000) illustrate, in their Western sample, that females express more positive attitudes towards the environment than males, while Zelezny, Chua and Alrich (2000) provide additional evidence that women had stronger environmental attitudes than men in 14 countries (Argentina, Canada, Columbia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Spain, the United States and Venezuela), irrespective of age. Given the above, marketers and policy makers need to identify the antecedents of such behavior in order to encourage ECCB among target markets.

Studies in green marketing literature have attempted to define the characteristics of green consumers for segmentation purpose. Market orientation and consumer segmentation are vital so that marketers can propose optimum approaches to engage them in ECCB. A review of literature indicates a number of studies that identify demographic variables that shape the green consumer profile. Such variables, when significant, offer easy and efficient ways for marketers to segment the market and capitalize on green attitudes and behaviors (Samdahl & Robertson 1989; Roberts 1996b; Roberts & Bacon 1997; Jain & Kaur 2006; D'Souza et al. 2007).

Specific research has examined the impact of age (Hallin 1995; E.Olli et al. 2001; Roberts 1993), gender (Barber et al. 2009; Eagly 1987; E.Olli et al. 2001; Hunter et al. 2004; Laroche et al. 2000; Roberts 1997), income (Diamantopoulos et al. 2003), and education (Guagnano & Markee 1995; Roberts 1997) on ECCB. The findings suggest that older age groups that are female and well educated are more likely to engage in ECCB. Likewise, Roberts (1993) finds that age has a positive impact on green consumption which translates into ECCB. Similarly, E.Olli et al. (2001) identifies older age groups, who are female and well educated, as more likely to engage in ECCB. Results from a meta-review by Zelezny et al. (2000), from 1988 to 1998, found that in nine of 13 studies, women are significantly more active in environmental issues than men. Three of the studies find no statistically significant difference between males and females, while one study reports greater male participation. Laroche et al. (2001) find that gender, marital status, and family size are important to ECCB. Diamantopoulos et al. (2003) report that the linkage between gender and environmental knowledge is significant, with the large majority of authors concluding that males tend to have higher and better knowledge about green issues than females. Torgler et al. (2008) identify gender and age as important determinants of environmental attitudes and behavior. Overall, various demographic variables, such as age, income, education and gender, robustly effect ECCB, while the power of

demographic variables in explaining ECCB produces mixed results.

METHODOLOGY

SAMPLE AND DATA COLLECTION

The data collection method utilized self-administered questionnaires based upon the fundamental constructs proposed in the conceptual model. The questionnaire was composed of two main sections. The first section consisted of three parts to examine the environmental dimension (PCE, EC and ECCB) used by Roberts (1996a) and Straughan and Roberts (1999). The environmental dimensions consisted of ECCB with 14 items, PCE with 20 items and EC with 11 items. All the items were developed using a seven-point Likert-scale. For the purpose of data interpretation, the descriptive phrases for the scales ranged from (7) "Strongly Agree" to (1) "Strongly Disagree". The Likert-scales were chosen due to the fact that they take less time and are easy to answer (Churchill 1995). The seven-point Likert scale is widely used in marketing research, with De Vaus (2002) asserting that the seven Likert-scale is more capable than the 5-point Likert scales, regarding its likelihood to allow greater discrimination by respondents. In the second section of the survey, data was collected on the respondents' demographic characteristics, including religion, gender, age, income and educational level.

Data for this study was collected through a survey distributed randomly among Malaysian consumers nationwide, using the convenience sampling technique. From a total of 500 questionnaires distributed, 319 were returned, yielding a response of 64% which is considered sufficiently large for statistical reliability and generalizability (Stevens 2002; Tabachnick & Fidell 1996). The respondents comprised government and private sector employees, students and retirees. They were of different ethnicities, genders and age groups, reflecting the Malaysian consumer population. Procedures used to analyze the data include the Kaiser-Mayer-Olkin test (KMO), the Barlett's Test, frequency, correlations, factor analysis, and a multiple linear regression.

RESULTS AND FINDINGS

RESPONDENT CHARACTERISTICS

Table 1 demonstrates the demographic profile of the respondents by race, gender, age, education, occupational status and income. In terms of race, the sample represents the general Malaysian population ratio. The majority of respondents were Malay (66.8%) followed by Chinese (23.8%) and Indian/others (9.4%). The male respondents represented 50.8 percent of the total respondents, while

female respondents represented 49.2 percent of the total respondents. 33.2 percent of the respondents had monthly household incomes above RM 6,000, with 66.8 percent of households reporting income less than RM 6,000. The

majority of respondents (75.9%) were from the younger age group, ranging from 21 to 30 years old, and a high proportion came from tertiary education backgrounds (64.6%).

TABLE 1. Characteristics of respondents

Demographic variable	Item	Frequency	Percentile
Race	Malay	213	66.8
	Chinese	76	23.8
	Indian	17	5.3
	Others	13	4.1
Gender	Male	162	50.8
	Female	157	49.2
Age	20 years and lower	31	9.7
	21 - 30 years old	242	75.9
	31 - 40 years old	21	6.6
	41 - 50 years old	16	5.0
	51 years old and more	9	2.8
Highest educational level	Degree/Masters/PHD and above	206	64.6
	H.School/STPM/HSC/College/Dip.	73	22.9
	Primary and lower	1	.3
	Secondary/SPM/MCE	39	12.2
Occupational status	Working	276	86.5
	Student	41	12.9
	Retired/pensioner	2	0.6
Monthly household income	RM1,500 and lower	52	16.3
	RM1,501 - RM3,000	45	14.1
	RM3,001 - RM4,500	69	21.6
	RM4,501 - RM6,000	47	14.7
	RM6,001 and higher	106	33.2

FACTOR ANALYSIS

For this study, factor analysis, under the extraction method of principal component analysis with the rotation method of varimax with Kaiser Normalization, was used to analyze the scales. Varimax rotation was used, as it minimized the correlation across factors and maximized within the factors. This helped to yield ‘clear’ factors (Nunnally 1978). Nunnally (1978) posits that items with loadings higher than 0.50 on one factor are retained for further analysis. For the ECCB scale, the factor analysis identified 2 factors, with Kaiser-Meyer-Olkin measure of sampling adequacy of 0.917. These 2 factors explained 57.5% of total variance and had eigenvalues over 1. After applying a Varimax rotation, items 4, 5, 7, 8, and

11 were loaded onto factor 1. Items 3, 9, 12, 13, and 14 were loaded onto factor 2. All items were considered in the analysis to prevent loss of information, where higher scores indicated greater levels of ECCB. A Cronbach’s alpha of 0.88 was obtained.

For the PCE-Environment Related Past Experience behavior scale, the factor analysis identified 2 factors. The Kaiser-Meyer-Olkin measure of sampling adequacy was recorded at 0.858. These 2 factors explained 67.5% of total variance and had eigenvalues over 1. After applying a Varimax rotation, factor 1 was loaded by items 5, 6, 7, and 8 and items 1, 2, 3, and 4 were loaded onto factor 2 (Table 3). Higher scores indicated greater levels of PCE. A Cronbach’s alpha of 0.87 was obtained for this scale.

TABLE 2. ECCB scale items and factor loadings

Items	Factors	
	1	2
4	I will not buy products which have excessive packaging.	0.70
5	I have switched products for ecological reasons.	0.75
7	I do not buy products in aerosol containers.	0.75
8	Whenever possible, I buy products packaged in reusable containers.	0.57
11	I only buy products such as toilet paper, face tissues and paper towels that are made from recycled paper.	0.69
3	I always look out for energy saving/efficient products whenever I shop for household appliances.	0.53
9	When I have a choice between two equal products, I always purchase the one less harmful to other people and the environment.	0.63
12	I always try to minimize the amount of electricity I use.	0.73
13	I purchase a particular brand of household appliance as it uses less electricity than other brands.	0.79
14	I usually purchase light bulbs that are more expensive but save energy.	0.76

TABLE 3. PCE – Environment related past experience behavior scale items and factor loadings

Items	Factors	
	1	2
5	Been a member of an environmental group.	0.748
6	Have provided financial support to clean up the environment.	0.814
7	Written to government body or a lobby group on issues related to environment.	0.862
8	Attended a rally or a demonstration on an environmental issue.	0.854
1	Gone out of your way to seek out biodegradable products.	0.783
2	Used a car pool or walk, bike, or take public transit for the specific reason of protecting the environment.	0.712
3	Consciously avoided styro foam packaging.	0.786
4	Kept your garbage in separate piles of glass, plastic, paper, newspapers, and metal for recycling.	0.585

For the PCE-Environment Related Intention behavior scale, the factor analysis identified 2 factors. The Kaiser-Meyer-Olkin measure of sampling adequacy was recorded at 0.885. These 2 factors explained 72% of total variance and had eigenvalues over 1. After applying

a Varimax rotation, similarly items 5, 6, 7, and 8 were loaded onto factor 1 and items 1, 2, 3, and 4 were loaded onto factor 2 (Table 4). Higher scores indicated greater level of PCE. A Cronbach’s alpha of 0.90 was obtained for this scale.

TABLE 4. PCE – Environment related intention behavior scale items and factor loadings

Items	Factors	
	1	2
5	Be a member of an environmental group.	0.727
6	Provide financial support to clean up the environment.	0.780
7	Write to government body or a lobby group on issues related to environment.	0.839
8	Attend a rally or a demonstration on an environmental issue.	0.871
1	Go out of your way to seek out biodegradable products.	0.830
2	Used a car pool or walk, bike, or take public transit for the specific reason of protecting the environment.	0.661
3	Consciously avoid Styrofoam packaging.	0.859
4	Keep your garbage in separate piles of glass, plastic, paper, newspapers, and metal for recycling.	0.740

For the PCE-Willingness to Pay scale, only 1 factor analysis was identified (Table 5). Kaiser-Meyer-Olkin measure of sampling adequacy was recorded at 0.853. The factor explained 66.38% of total variance and had

eigenvalues over 1. Higher scores indicated greater level of PCE. A Cronbach’s alpha of 0.87 was obtained for this scale.

TABLE 5. PCE – Willingness to pay scale items and factor loadings

Items		Factor 1
1	Pay five cents a litre more for gasoline to decrease air pollution.	0.775
2	Pay 10 percent more for groceries packaged and produced in an environmentally safe manner.	0.860
3	Pay RM1,000 more for a car that emits less air pollution.	0.825
4	Pay 50% more for garbage collection to pay for safe long term disposal	0.845
5	Buy unbleached paper products such as toilet paper, and paper.	0.762

For the PCE-Regulatory Support scale, the factor analysis identified 1 factor with Kaiser-Meyer-Olkin measure of sampling adequacy was recorded at 0.857. This factor explained 70.8% of total variance and had

eigenvalues over 1. After applying a Varimax rotation, factor 1 was loaded by items 1, 2, 3, 4, 5, and 7 (Table 6). Higher scores indicated greater level of PCE. A Cronbach’s alpha of 0.84 was obtained for this scale.

TABLE 6. PCE – Regulatory support scale items and factor loadings

Items		Factors	
		1	2
1	The government preservation of more land as natural wilderness and excluding it from any resource exploitation and development.	0.874	
2	A law requiring all household garbage to be separated into different classes for recycling.	0.850	
3	Tax breaks and incentives for industry to encourage development and implementation of clean technology.	0.845	
4	Government control to reduce packaging on consumer goods.	0.759	
5	Stiff jail sentences for polluters.	0.670	
7	A ban on bug and weed pesticides for lawn and garden use.	0.630	

For the EC scale, the factor analysis identified 2 factors with Kaiser-Meyer-Olkin measure of sampling adequacy was recorded at 0.829. These 2 factors explained 55.3% of total variance and had eigenvalues over 1. After applying a Varimax rotation, factor 1 was

loaded by items 1, 2, 3, 5, 6, 7, 8, and 9 and items 4, 10, and 11 were loaded onto factor 2 (Table 7). Higher scores indicated greater level of PCE. A Cronbach’s alpha of 0.76 was obtained for this scale.

TABLE 7. EC scale items and factor loadings

Items		Factors	
		1	2
1	We are approaching the limit of the number of people the earth can support	0.587	
2	To maintain a healthy economy, we will have to develop a steady-state economy where industrial growth is controlled	0.710	
3	The earth is like a spaceship with only limited room and resources.	0.714	
5	There are limits to growth beyond which our industrialized society cannot expand	0.534	
6	The balance of nature is very delicate	0.687	
7	When humans interfere with nature, it often produces disastrous consequences.	0.808	
8	Humans must live in harmony with nature in order to survive.	0.775	
9	Mankind is severely abusing the environment.	0.743	
4	Humans need not adapt to the natural environment because they can remake it to suit their needs.		0.778
10	Humans have the right to modify the natural environment to suit their needs.		0.832
11	Mankind was created to rule over the rest of nature.		0.745

All the above results enabled the factor analysis to be further analyzed. Furthermore, the Bartlett's Test of Sphericity was all significant at 0.00 levels. This indicated that there are inter-correlations among the variables.

CORRELATION

Using correlation, the preliminary analysis (Table 8) showed demographic variables, age ($r = 0.211$, p -value

$= 0.000 < 0.05$), gender ($r = 0.164$, p -value = $0.003 < 0.05$) and education ($r = 0.169$, p -value = $0.003 < 0.05$) had significant correlation with ecological conscious consumer behavior. Age was shown to have the highest correlation with ecological conscious behavior. In terms of psychographic variables, PCE ($r = 0.683$, p -value = $0.000 < 0.05$) and EC ($r = 0.398$, p -value = $0.000 < 0.05$) showed significant correlation with ecological conscious behavior.

TABLE 8. Correlations of ECCB on demographic and psychographic variables

	PCE	EC	Age	Gender	Income	Education
Pearson Correlation	0.683**	0.398**	0.211**	0.164**	0.066	0.169**
Sig. (2-tailed)	0.000	0.000	0.000	0.003	0.241	0.003

Notes: Correlation is significant at 0.01** levels (two-tailed).

MULTIPLE LINEAR REGRESSIONS

Three separate regression models were developed to test the hypotheses in this study. Results are shown in Table 9. Model I regressed the ECCB construct on four demographic variables (i.e. age, gender, education and income). The results showed that all demographic variables were significant in explaining ECCB except income. Collectively, the demographic variables explain 8.6% of the dimension of attitude in relation to environmental ECCB. The second regression model (Model II) includes only the psychographic predictor variables. The results indicated that PCE was positive and significant, while EC was not. Even with only one variable

significant, the psychographic-only model (Model II) outperformed the demographic-only model (Model I), as indicated by the R-squared value of 52.8%. This finding suggests that the influence of attitude is more important than demographic factors in shaping ECCB. In other words, the psychographic variables explain the ECCB variable more significantly than the demographic variables. The third analysis (Model III) included the entire predictor variables. The results indicated that education, income and EC were insignificant. On the other hand, age, gender and PCE remain significant. The full model contributed 55.2%, which represents a marginal (but significant) increase over the psychographics-only model.

TABLE 9. Regression of ECCB on demographic and psychographic variables

Variables	Model I			Model II			Model III		
	Coeff	t-stats	Sig.	Coeff	t-stats	Sig.	Coeff	t-stats	Sig.
Age	0.234	4.205	0.000				0.207	5.296	0.000
Gender	0.176	3.214	0.001				0.082	2.098	0.037
Education	0.140	2.485	0.013				0.048	1.208	0.228
Income	-0.057	-0.999	0.319				-0.022	-0.557	0.578
PCE				0.691	15.415	0.000	0.651	14.724	0.000
EC				0.070	1.558	0.120	0.075	1.711	0.088
R-squared	0.086			0.528			0.552		
F-stats	8.482			176.549			65.833		
p-value	0.000			0.000			0.000		
Df	4			2			6		

Note: The intercepts were not reported but consistently significant at 1% level.

DISCUSSION AND CONCLUSION

The findings show two demographic factors, specifically age and gender, influence ECCB significantly. In regards

to psychographic variables, PCE has greater influence on ECCB, when compared with EC. This means that respondents who were engaged in ECCB, such as purchasing products that are less harmful to people and the environment; using a particular brand of appliances

that use less electricity; looking out for energy saving products; and engaging in recycling activities do so because they believe they have the power to significantly affect change and help save the environment. The findings augment previous researches that PCE can be used as a strong predictor regarding pro-environmental behavior (Berger & Corbin 1992; Ellen et al. 1991; Kim 2002; Kim & Choi 2005; Lee & Holden 1999; Roberts 1996a; Straughan & Roberts 1999). Based on these findings, it may be surmised that marketers must recognize their potential roles and responsibilities in promoting environmental products. Fundamentally, it is imperative that attention is focused on psychographic variables as part of their marketing strategy.

Results from the current study confirm theoretical and empirical research on the need to use specific attitudinal measures to predict specific behavioral patterns. Therefore, marketers and companies promoting eco-friendly products would be in a better position if they used specific consumer characteristics and attitudes to predict consumer purchasing behavior. Companies must convince consumers that their actions in purchasing and consuming eco-friendly products make a difference in improving the environment and protecting it from further deterioration. Specifically, in the Malaysian context, continuous campaigns by the government and private sectors in promoting green activities and developing more environmentally sound products would have a considerable influence on Malaysian environmental attitudes. Consumers need to be informed and convinced that their contribution matters. Only then will they be willing to contribute to pro-environmental behavior that would eventually make a difference in saving the environment.

Although most Malaysian consumers support government environmental related policies, the support is not always translated into behavior. In this case, the government has a vital role to play in creating the right economic and social environment for ECCB to thrive. In today's world of global markets, environmental and social challenges require governments to be proactive in order to foster ECCB. This can be achieved by working in partnership with companies in various campaigns. For example, the 'No Plastic Bags on Saturday' campaign exemplifies the proactive call to action from both the government and the private sector. This broadened view of environmental initiatives includes other dimensions, such as more environmentally conscious designs of new buildings to reduce energy emission; the availability of recycling bins in each division in companies; and making the use of environmental friendly products compulsory and intensive in the office. In addition, the government and private sector employers could organize activities to raise environmental awareness and promote the adoption of environmental friendly working cultures or lifestyles. The fact is that there is an urgent need to increase ECCB, be it in the office or at home, and, subsequently, a need for policies that foster such behavior must be recognized

as a priority.

One of the limitations of the present study is that it was confined to consumers in Malaysia. In other words, before a strong conclusion can be drawn, there is a need to replicate the study in other countries, particularly in other South East Asian nations. In comparison to consumers in developed markets, consumers in this region have not been fully exposed to the variety of green or environmental friendly products. Thus, there is also a huge potential to explore the attitudes and ECCB patterns of these consumers by considering specific types of green purchase attitudes, such as the importance or convenience of buying eco-friendly products. Lastly, although there appear to be many empirical studies, the results from demographic-based investigations are still far from conclusive and warrant more research, particularly within the South East Asian region.

ACKNOWLEDGEMENT

The authors would like to express their gratitude to the Ministry of High Education-Fundamental Research Grant Scheme (MOHE-FRGS) Grant Phase 2/2010 (#021000110001) as the main sponsor for the project.

REFERENCES

- Agarwal, B. 2000. Conceptualizing environmental collective action: why gender matters. *Cambridge Journal of Economics* 24(3): 283-310.
- Anderson, Jr., W. T., Henion, K. E. & Cox, E. P. 1974. Socially vs. ecologically responsible consumers. *AMA Combined Conference Proceedings* 36 (Spring & Fall): 304-311.
- Antil, J. H. 1984. Socially responsible consumers: profile and implication for public policy. *Journal of Macro Marketing* 4: 18-39.
- Arcury, T. 1990. Environmental attitude and environmental knowledge. *Human Organization* 49(4): 300-304.
- Bang, H., Ellinger, A. E., Hadjimarcou, J. & Traichal, P. A. 2000. Consumer concern, knowledge, belief, and attitude toward renewable energy: an application of the reasoned action theory. *Psychology and Marketing* 17(1): 6-26
- Barber, N., Taylor, C. & Strick, S. 2009. Wine consumers environmental knowledge and attitudes: influence on willingness to purchase. *International Journal of Wine Research* 1(1): 59-72.
- Bazoche, P., Deola, C. & Soler, L. 2008. An experimental study of wine consumers' willingness to pay for environmental characteristics. 12th Congress of the European Association of Agriculture Economists. Available at: www.legrenelle-environment.fr/grenelle-environment.
- Berger, I. E. & Corbin, R. M. 1992. Perceived consumer effectiveness and faith in others as moderators of environmentally responsible behaviors. *Journal of*

- Public Policy & Marketing* 11: 79-89.
- Churchill, G. A. 1995, *Marketing research methodological foundations*. 6th edition. Fort Worth: The Dryden Press.
- Creyer, E. H. & Ross, W. T. 1997. The influence of firm behavior on purchase intention: Do consumers really care about business ethics? *Journal of Consumer Marketing* 14(6): 421-432.
- Curlo, E. 1999. Marketing strategy, product safety, and ethical factors in consumer choice. *Journal of Business Ethics* 21(1): 37-48.
- Dahlsrud, A. 2007. How corporate social responsibility is defined: An Analysis of 37 Definitions Corporate Social Responsibility and Environmental Management Corp. Soc. Responsible. *Environ. Mgmt.* (in press). Available at <http://www.interscience.wiley.com>
- De Vaus, D. 2002. *Analyzing Social Science Data*. London: Sage Publications.
- Diamantopoulos, A., Schlegelmilch, B., Sinkovics, B. & Bohlen, G. 2003. Can socio demographics still play a role in profiling green consumers? a review of the evidence and an empirical investigation. *Journal of Business Research* 56: 465-480.
- D'Souza, C., Taghian, M., Lamb, P. & Peretiatkos, R. 2007. Green decisions: demographics and consumer understanding of environmental labels. *International Journal of Consumer Studies* 31(4): 371.
- Eagly, A. H. 1987. *Sex Differences in Social Behavior: A Social Role Interpretation*. Hillsdale: Lawrence Erlbaum Associates.
- Ellen, P. M., Wiener, J. L. & Cobb-Walgren, C. 1991. The role of perceived consumer effectiveness in motivating environmentally conscious behaviors. *Journal of Public Policy and Marketing* 10: 102-117.
- Gilg, A., Barr, S. & Ford, N. 2005. Green consumption or sustainable lifestyles? identifying the sustainable consumer. *Futures* 37: 481-504.
- Guagnano, G. & Markee, N. 1995. Regional differences in the socio-demographic determinants of environmental concern. *Population and Environment* 17(2): 135-149.
- Gura'u, C. & Ranchhod, A. 2005. International green marketing: a comparative study of British and Romanian Firms. *International Marketing Review* 22(5): 547-61.
- Hallin, P. 1995. Environmental concern and environmental behavior in Foley, a small town in Minnesota. *Environmental and Behavior* 27: 558-578.
- Harris, P. G. 2006. Environmental perspectives and behavior in China: synopsis and bibliography. *Environment and Behavior* 38(1): 5-21.
- Hunter, L., Hatch, A. & Johnson, A. 2004. Cross-national gender variation in environmental Behaviors. *Social Science Quarterly* 85: 677-94.
- Jain, S. & Kaur, G. 2006. Role of socio-demographics in segmenting and profiling green consumers: an exploratory study of consumers in India. *Journal of International Consumer Marketing* 18(3): 107-117.
- Kim, Y. 2002. *The impact of personal value structures on consumer pro-environmental attitudes, behaviors and consumerism: A cross-cultural study*. Unpublished doctoral dissertation, College of Communication Arts and Sciences, Michigan State University.
- Kim, Y. & Choi, S. M. 2005. Antecedents of green purchase behavior: An examination of collectivism, environmental concern and PCE. *Advances in Consumer Research* 32: 592-599.
- Kinney, T. C., Taylor, J. R. & Ahmed, S. A. 1974. Ecologically concerned consumers: who are they? *Journal of Marketing* 38(April): 20-24.
- Kollmus, A. & Agyeman, J. 2002. 'Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research* 8(3): 239-260.
- Laroche, M., Bergeron, J. & Barbaro-Forleo, G. 2001. Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing* 18(6): 503-520.
- Laroche, M., Saad, G., Cleveland, M. & Browne, E. 2000. Gender differences in information search strategies for a Christmas gift. *Journal of Consumer Marketing* 17(6): 500-522.
- Lee, J. A., & Holden, S. J. S. 1999. Understanding the determinants of environmentally conscious behavior. *Psychology and Marketing* 16(5): 373-392.
- Li, J.J. & Su, C. 2007. How face influences consumption: a comparative study of American and Chinese consumers. *International Journal of Market Research* 49(2): 237-256.
- McEvoy, J. 1972. *The American Concern with the Environment, in Social Behavior, Natural Resources, and the Environment*. New York: Harper and Row.
- Mostafa, M. M. 2007. Gender differences in Egyptian consumers' green purchase behavior: the effects of environmental knowledge, concern and attitude. *International Journal of Consumer Studies* 31(3): 220-229.
- Nebenzahl, I. D., Jaffe, E. D. & Kavak, B. 2001. Consumers' punishment and rewarding process via purchasing behavior. *Teaching Business Ethics* 5(3): 283-305.
- Nunnally, J. C. 1978. *Psychometric Theory*. New York: McGraw-Hill.
- Olli, E., Grendstad, D. & Wollebark, D. 2001. Correlates of environmental behaviors: bringing back social context. *Environment and Behavior* 33: 181-208.
- Oskamp, S. 2000. A sustainable future for humanity? How can psychology help? *American Psychologist* 55(5): 496-508.
- Peattie, K. 1995. *Environmental Marketing*

- Management*. London: Pitman Publishing.
- Peattie, K. & Charter, M. 1997, Green marketing. In *Green Management*, edited by P. McDonagh & A. Prothero, 388-412. New York: Dryden.
- Roberts, J. 1993. Sex differences in socially responsible consumers' behavior. *Psychological Reports* 7: 139-148.
- Roberts, J. A. 1996a. Green consumers in the 1990s: profile and implications for advertising. *Journal of Business Research* 36(3): 217-231.
- Roberts, J. A. 1996b. Will the real socially responsible consumer please step forward? *Business Horizons* 33 (January-February): 79-83.
- Roberts, J. A., & Bacon, D. R. 1997. Exploring the subtle relationships between environmental concern and ecological conscious consumer behavior. *Journal of Business Research* 40(1): 79-89.
- Saunders, C. 2003. The Emerging Field of Conservation Psychology. *Human Ecology Review* 10: 137-149.
- Samdahl, M. E. & Robertson, R. 1989. Social determinants of environmental concern: Specification and test of the model. *Environmental and Behavior* 21(1): 57-81.
- Stevens, J. P. 2002. *Applied multivariate statistics for the social sciences*. London: Lawrence Erlbaum Associates Publishers.
- Straughan, R. D. & Roberts, J. A. 1999. Environmental segmentation alternatives: a look at green consumer behaviour in the new millennium, *Journal of Consumer Marketing* 16: 558-575.
- Tabachnick, B. G. & Fidell, L. S. 1996. *Using Multivariate Statistics*. New York: Harpercollins.
- Tikka, P., Kuitunen, M. & Tynys, S. 2000. Effects of educational background on students' attitudes, activity levels, and knowledge concerning the environment. *Journal of Environmental Education* 31: 12-19.
- Tognacci, L. N., Weigel, R. H., Wideen, M. F., & Vernon, D. T. 1972. Environmental quality: how universal is public concern? *Environment and Behavior* 4 (March): 73-86.
- Torgler, B., Garcia-Valinas, M., Macintyre, A. 2008. Differences in preference towards the environment: the impact of a gender, age and parental effect. Discussion paper 221, QUT School of Economics and Finance, Brisbane, 1-37.
- Van Liere, K. D. & Dunlap, R. E. 1981. The Social base of environmental concern: a review of hypotheses, explanations and empirical evidence. *Public Opinion Quarterly* 44: 181-197.
- Webster, Jr. & Frederick, E. 1975. Determining the characteristics of the socially conscious consumer. *Journal of consumer Research* 2: 188-196.
- Weiner, J. L. & Doescher, T. A. 1991. A framework for promoting cooperation. *Journal of Marketing* 55: 38-47.
- Xiao, C. & McCright, A. M. 2007. Environmental concern and socio-demographic variables: a study of statistical models. *Journal of Environmental Education* 38(1): 3-14.
- Yeung, S. P. 2005. Teaching approaches in geography and students' environmental attitudes. *The Environmentalist* 24(1): 101-117.
- Zelezny, L., Chua, P. & Alrich, C. 2000. Elaborating on gender differences in environmentalism. *Journal of Social Issues* 56(3): 443-457.
- Zimmer, M. R., Stafford, T. F. & Marla, R. 1994. Green issues: dimensions of environmental concern, *Journal of Business Research* 30(1): 63-74.
- Zuraidah Ramly
Faculty of Business Management,
Universiti Teknologi MARA
40450 Shah Alam, Selangor Darul Ehsan, Malaysia
E-mail: zuraidah_ramly@yahoo.com
- Nor Hashima Hashim
Faculty of Business Management,
Universiti Teknologi MARA
40450 Shah Alam, Selangor Darul Ehsan, Malaysia
E-mail: norhashima@salam.uitm.edu.my
- Wan Kalthom Yahya
Faculty of Business Management,
Universiti Teknologi MARA Pahang, Kampus Jengka,
Lintasan Semarak, Bandar Pusat Jengka, 26400 Pahang
E-mail: wkalthom@pahang.uitm.edu.my
- Siti Aishah Mohamad (corresponding author)
Faculty of Business Management,
Universiti Teknologi MARA Pahang, Kampus Jengka,
Lintasan Semarak, Bandar Pusat Jengka, 26400 Pahang
E-mail: sitia@pahang.uitm.edu.my

