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Attitude towards the Environment and Green Products:

Consumers' Perspective

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Abstract: The current rapid growth in the economy and the patterns of consumers' consumption and behavior worldwide are the main cause of environmental deterioration. As the environment continues to worsen, it has become a persistent public concern in the developed countries and has recently awakens developing countries to the green movement. This paper is essentially exploratory in nature and has two objectives. The first objective is to compare gender with attitudes towards the environment and green products. The second objective is to investigate the relationship between attitude towards the environment and green products. Result from the independent sample t-test shows that there were no significant differences between gender in their environmental attitudes and attitudes on green products. The rotated factor matrix validated the underlying dimensions of environmental attitudes into three major dimensions (environmental protection, government's role, and personal norm). Results from the multiple linear regression analysis revealed that consumer attitudes on the government's role and their personal norm towards the environment contributed significantly to their attitude on green product. Further investigation revealed that personal norm was the most important contributor to the attitude towards green product. However, environmental protection did not contribute significantly to consumers' attitudes on green product.

Keywords: Environmental attitude; green products; consumer behaviour; Malaysia

1. INTRODUCTION

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The past decades are witness to the rapid economic growth through increasing consumers' consumption worldwide. This in turn causes environmental deterioration through over-consumption and utilization of natural resources. The consequences of environmental degradation are global warming, depletion of stratospheric ozone layer, pollution of sea and rivers, noise and light pollution, acid rain and desertification (Ramlogan, 1997). Grunert (1993) reported that about 40% of environmental degradation has been brought about by the consumption activities of private households. As the environment continues to worsen, it has become a persistent public concern in developed countries. Furthermore it has also awakens developing countries to the green movement for preservation of the environment.

Creating customer satisfaction and building long-term profitable customer relationship are some of the primary objectives firms try to achieve to sustain their businesses in the competitive business world. With an increased in the social and political pressures, many firms embraced green marketing strategies and exploited these environmental issues as a source of competitive advantage. Profit driven firms are usually motivated to adopt the concept of green marketing in their businesses provided that consumers demonstrate a high degree of environmental attitude and hence translate this into environmental friendly purchasing commitment. Hence many companies started to be more socially responsive in addressing pollution and waste disposal by developing environmentally friendly packaging and putting in numerous efforts to keep in-step with the environmental movement. However, some of the greatest challenges faced by these firms are changes in consumer preferences, suspicion of green advertising claim, unfavorable consumer perception of green products and the high cost invested in developing green products. As a result, it is vital to explore how consumers view the environmental issues, and how they behave, especially in their attitudes towards green products or environmental friendly products.

This paper is essentially exploratory in nature and has two objectives. The first objective is to compare the demographic of gender with attitudes towards the environment and green products. The second objective is to investigate the relationship between attitude towards the environment and green products. The paper begins by providing theoretical background of the relevant literature. Thereafter the methodology and the results from the quantitative study will be presented. The paper concludes with a discussion of the results, limitations and directions for future research.

2. LITERATURE REVIEW

2.1 Environmental Quality in Malaysia

Malaysia experienced a short period of slight to moderate haze from July until October 2006 due to the trans-boundary pollution from neighboring countries (Department of Environment Malaysia, 2006). The air quality status in different states differed according to the geographical locations, the industrial and commercial activities, populated areas and the traffic conditions. During that period, Klang Valley area in Malaysia was more prone to air pollution than any other areas and the air quality was only good 23% of the time, moderate 70% of the time and the remaining 7% at an unhealthy level.

Developing country like Malaysia faced great challenges in ensuring a balance between development and environmental sustainability. Urban air and river quality, deforestation, household waste and hazardous waste are some of the serious and worrying environmental problems faced by the country. To ensure environmental sustainability and resource management, Malaysian government allocated RM510 million for cleaning, preserving and beautifying rivers; RM530 million for coastal management; RM200 million for reforestation; and another RM70 million for the management of wildfire and protected areas as reported in The Ninth Malaysia Plan (2006-2010).

Solid waste management encountered by the government is on an upward trend with a total of 1,103,457.06 metric tones of waste generated in 2006 as compared to 548,916.11 metric tones in 2005

(Department of Environment Malaysia, 2006). Gypsum, oil and hydrocarbon, dross, heavy metal sludge, mineral sludge and e-waste are the main categories of waste produced in Malaysia. Quantity of scheduled wastes generated by industry ranked from chemicals (42.7%), electronic (21.6%), automotive/workshop (17.2%), metal (7.1%), pharmaceutical (2.9%) and other industries (Department of Environment Malaysia, 2006). It is anticipated that if the current trend of economic growth and irresponsible consumption pattern continues, the environment degradation would worsen. Therefore, a shift towards more sustainable consumption patterns is required.

2.2 Green Marketing

Green marketing is considered one of the major trends in modern business (Kassaye, 2001; McDaniel and Rylander, 1993; Pujari and Wright, 1996). Soonthonsmai (2007) defined green marketing as the activities taken by firms that are concern about the environment or green problems by delivering the environmentally sound goods or services to create consumers and society's satisfaction. Other definitions of green marketing as proposed by marketing scholars include social marketing, ecological marketing or environmental marketing. Harrison (1993) proposed green marketing strategy by firms through positioning the environmental benefits of green products to consumers' mindset to influence their purchasing decision. Peattie (1995) and Welford (2000) defined green marketing as the management process responsible for identifying, anticipating and satisfying the requirements of customers and society in a profitable and sustainable way.

In reality, companies that pursue green marketing encounter numerous challenges mainly from the variability of demand, un-favorable consumer perception and high cost (Gurau and Ranchhod, 2005). The key concern lies in an understanding of green consumers and their characteristics to enable firms to develop a new target and segmentation strategies (D'Souza et al., 2007).

2.3 Green Consumers and Green Products

In general, green product is known as an ecological product or environmental friendly product. Shandasami et al., (1993) defined green product as the product that will not pollute the earth or deplete natural resources, and can be recycled or conserved. It is a product that has more environmentally sound content or packaging in reducing the environmental impact (Elkington and Makower, 1988; Wasik, 1996). In other words, green product refers to product that incorporates the strategies in recycling or with recycled content, reduced packaging or using less toxic materials to reduce the impact on the natural environment. Krause (1993), in his research found that consumers were becoming more concerned about their everyday habits and the impact on the environment. The outcome of this is that some of the consumers translated their environmental concern into actively purchasing green products commitment (Martin and Simintiras, 1995).

Consumers who are aware of and interested in environmental issues are called green consumers (Soonthonsmai, 2007). These green consumers usually organized petitions, boycotted manufacturers and retailers and actively promote the preservation of the planet (Fergus, 1991). Ottman (1992) reported that consumers accepted green products when their primary need for performance, quality, convenience, and affordability were met, and when they understood how a green product could help to solve environmental problems. The knowledge gap on the uses and values of green products prevents consumers in committing themselves to any purchase decisions. Table 1 reported some studies from different countries on green consumers.

2.4 Environmental Attitudes

Allport (1935) defined attitude as: "A mental and neural state of readiness, which exerts a directing, influence upon the individual's response to all objects and situations with which it is related". According to Schultz and Zelezny (2000), "attitudes of environmental concern are rooted in a person's concept of self and the degree to which an individual perceives him or herself to be an integral part of the natural environment". In conclusion, attitude represents what consumers like and dislike (Blackwell et al., 2006) and consumers' product purchasing decisions are often based on their environmental attitudes (Irland, 1993; Schwepker and Cornwell, 1991).

There is a general belief among researchers and environmental activists that through purchasing environmentally friendly products or green products, products with recyclable packaging or properly disposing of non-biodegradable garbage, consumers can contribute significantly to improve the quality of the environment (Abdul-Muhmim, 2007). The quality of the environment depends critically on the level of knowledge, attitudes, values and practices of consumers (Mansaray and Abijoye, 1998). Attitudes are the most consistent explanatory factor in predicting consumers' willingness to pay for green products (Chyong et al., 2006). This means that price is not the main factor in preventing consumers from purchasing green products if they are pro-environment.

Consumers' perceived level of self-involvement towards the protection of the environment may prevent them from engaging in environmentally friendly activities such as recycling (Wiener and Sukhdial, 1990). According to Tanner and Kast (2003), green food purchases strongly facilitated by positive attitude of consumers towards environmental protection. Personal norm is the feeling of moral obligation of consumers. It is a powerful motivator of environmental behavior (Hopper and Nielson, 1991; Stern and Dietz, 1994; Vining and Ebreo, 1992). The extent to which people feel obliged to recycle is related to conservation-related product attributes (Ebreo et al., 1999). These investigations suggested that environmentally friendly behavior may be characterized as morally demanding. Consumers feel morally obligated to protect the environment and to save the limited natural resources on the earth. However, Tanner and Kast (2003) found that consumers' green food purchases were not significantly related to moral thinking.

The role played by the government in environmental protection is undeniable. In promoting sustainable consumption practices among Malaysians, the Malaysian government publicized various strategies to implement sustainable consumption and development. To educate and foster environmental awareness and concern among the public, Malaysian government also opted for social advertising (Haron et al., 2005). The most significant factor affecting nature was not the official government policy but the public awareness on the environmental problems (Chukwuma, 1998). Many people have high ecological concern but have the sentiment that the preservation of the environment is the prime responsibility of the government (Chyong et al., 2006).

2.5 Demographic Characteristics

Straughan and Roberts (1999) segmented college students based upon ecologically conscious consumer behavior and stated that the younger individuals were likely to be more sensitive to environmental issues. The results of their study indicated that the demographic variables such as age and sex were significantly correlated with ecologically conscious consumer behavior when considered individually; and that income lacks significance. Green purchase intention correlates positively with every age and income except for education (Soonthonsmai, 2001). Many studies have shown significant differences between men and women in environmental attitudes (Brown and Harris, 1992; Tikka et al., 2000) with men having more negative attitudes towards the environment compared to women (Eagly, 1987; Tikka et al., 2000). Women were more likely to buy green product because they believe the product was better for the environment (Mainieri et al., 1997).

2.6 Hypotheses

Based on the previously cited theoretical and empirical literatures, the following hypotheses referring to the attitudes towards the environment and green products were proposed.

Hypothesis 1: There is a significant difference between male and female in their environmental attitudes.

Hypothesis 2: There is a significant difference between male and female in their attitude on green products.

Hypothesis 3: There is a significant relationship between consumer's attitude on the environmental protection and their attitude on green products.

Hypothesis 4: There is a significant relationship between consumer's attitude towards government's role and their attitude on green products.

Hypothesis 5: There is a significant relationship between the personal norm of consumers in environmental issues and their attitude on green products.

3. METHODOLOGY

3.1 Research Instruments

In order to obtain reliable information from the respondents, established and validated scales were selected for data collection.

In this study, the survey instrument of attitudes toward the environment as the independent variable was adopted from the scales developed by Tantawi et al. (2007). Only twenty items were used out of the original 38 items. Some items were dropped, as it was not suitable in the Malaysian context. The dependent construct, attitude towards green product was derived from Mostafa (2006) and consists of two items. The respondents were asked to rate each item on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree.

Table 2 indicated the reliability levels obtained in this study for attitudes toward the environment and on the green products. Schuessler (1971) stated that a scale is considered reliable if it has an alpha value greater than 0.60. Hair et al. (1998) added that reliability estimates between 0.60 and 0.70 represent the lower limit of acceptability in quantitative research studies. Due to the exploratory nature of this research, alpha value greater than 0.60 for reliability estimates is considered adequate.

3.2 Data Collection and Characteristics of Respondents

The questionnaires for this study were administered to 200 undergraduate students from a major private university in Malaysia. Ferber (1977) argued that using students sample is considered valid for exploratory studies. Furthermore, students are representing the new generation of consumers and have been a growing population of consumers in Malaysia. The students completed the survey during class time and were assured anonymity. Participation was voluntary and no remuneration was offered. The respondents were undergraduate business students and consisted of both sexes and of different races. A total of 184 completed the questionnaires (yielding a response rate of 92%) were obtained and deemed sufficiently complete to be useable. The majority of the respondents were female (67.4%) and of Chinese ethnicity (59.2%).

4. ANALYSIS AND RESULTS

4.1 Hypothesis 1 and 2: Independent sample t-test

The first part of the analysis used the independent sample t-test for measurement of differences in consumer's attitude on environment and green products between gender. Table 3 provides the results of the t-test for gender (male/female) and their attitudes on the environment and green products. Based on the SPSS results, H1 and H2 were not supported ($p > 0.05$). The results show that there were no significant differences between male and female students in their environmental attitudes and their attitudes on green products.

4.2 Hypothesis 3 to 5: Factor analysis and multiple linear regression

At the initial stage, factor analysis was conducted to identify factors that statistically explain the variation and co-variation among measures. Factor analysis can be viewed as data-reduction technique since it reduces a large number of overlapping measured variables to a much smaller set of factors (Green and Salkind, 2008). In interpreting the factor, only loading of 0.5 or greater on the factor was considered (Igbaria et al., 1995). Results from the factor analysis indicated that three significant factors with eigenvalues greater than 1 contributed 36.104% from the total of 20 components of the independent variables. The rotated factor matrix validated the underlying dimensions of environmental attitudes (independent variables) into three major dimensions (Table 4). The three significant factors were named environmental protection (5 items), government's role (3 items) and personal norm (2 items).

The KMO measure of sampling adequacy for the items was 0.869 (that is, > 0.7), indicating sufficient inter-correlations of the Bartlett's Test of Sphericity, which was found to be significant (Chi-square = 1263.085, $p < 0.005$). Thus, the sample size of 189 was adequate and satisfactory in this study. The cronbach alpha for each factor was shown in Table 4. Cronbach alpha for all the three factors were greater than 0.6 which means that the scale scores for each of the dimensions were reasonably reliable (Hair et al., 1998).

Multiple linear regression was performed to test hypotheses 3 to 5 on the three independent variables (environment protection, government's role, personal norm) towards consumer attitudes on green product (dependent variable). The result of this regression was shown in Table 5.

As highlighted in Table 5, the overall result for the regression model was significant (Significance = 0.000). It indicated that all the factors (environmental protection, government's role and personal norm) were simultaneously significant to the dependent variable; proven that the consumers' attitudes on the environment contributed significantly to the attitude on green products. From the adjusted R square value (Adjusted $R^2 = 0.196$), the three factors contributed 19.6% to the dimension of attitude towards green product.

From the analysis, factor 1 (environment protection) did not contribute significantly to the consumers attitudes on green product (significant value = 0.409, > 0.05). However, factor 2 (government's role) and factor 3 (personal norm) contributed significantly to the dependent variable (attitude on green product) with the significance values of 0.032 and 0.000 respectively. The results of standardized coefficient (beta) revealed that factor 3 (personal norm) was the most important variable that contributed to the dependent variable (beta = 0.408) followed by factor 2 (government's role) (beta = 0.171). The results of tolerance and VIF value for each factor were displayed in Table 6. Each factor tested the different dimensions clearly and without any multi-collinearity problem as indicated with the tolerance rate of more than 0.1 and $VIF < 10$ (Hair et al, 1998).

5. DISCUSSIONS AND CONCLUSION

The result indicated that there is no difference between gender in their environmental attitudes and their attitudes on green products. These results fail to support the first and second hypotheses. Many studies have shown the significant differences between men and women in environmental attitudes (Brown and Harris, 1992; Tikka et al. 2000) and in overall green purchase attitudes (Mostafa, 2007). However, in a Canadian study, Eagles and Muffitt (1990) found no differences between the genders in environmental attitudes. Samdahl and Robertson (1989) found the relationship not to be significant in the case of ecologically attitudes and genders. Moreover, D'Souza et al. (2007) indicated no differences with respect to gender in the respondents' attitude towards green labels. A large number of studies found little or no relationship between demographic characteristics and environmental attitudes and behavior as the demographic variables have less explanatory power than the psychographic variables (Schwepker and Cornwell, 1991). Thus results from gender-based investigations are still far from conclusive (Getzner and Krauter, 2003) and seems to warrant more future research.

In regards to hypothesis 3, the result indicated no significant relationship between consumers' attitude on the environmental protection and their attitude on green products. This means that consumers' attitudes on the green products are not facilitated by the positive attitudes of consumers towards environmental protection. It contrasted from the study by Tanner and Kast (2003) where the green food purchases were strongly facilitated by positive attitudes of consumer towards environmental protection. As the current study is not based on any specific green product, further investigation is required to study consumers' attitudes on the types of green products in the market. The perceived behavioral barriers are additional significant predictors of environmental behavior (Kalafatis et al., 1999).

As for hypothesis 4, the result shows that there is a significant relationship between consumers' attitude on government's role and their attitude on green products. Chyong et al., (2006) reported that many people have high ecological concern but have a feeling that the preservation of the environment is the prime responsibility of the government. From the result of hypothesis 4, it indicated the importance of government's role in preserving the environment. This in turn will influence consumers' attitude on the government's role in environmental issues and their attitudes to the green products. Consumers who supported the increase in governmental spending for environmental causes were willing to sacrifice economic growth for environmental protection, and considered themselves as environmentalists (Gallup and Newport, 1990).

Hypothesis 5 is supported in the study. Moral obligation or personal norm has also been shown to be an important factor as the basis for a pro-environmental behavioral disposition (Stern, 2000). Personal norms are motivated by an intrinsic moral obligation (Schwartz, 1973) and it is the feeling of moral obligation of consumers. In the study, consumers feel morally obligated to protect the environment and to save the limited natural resources from being used up. Environmental issues are very important to the consumers and it evoked their positive feelings on the green products. The results supported earlier studies; personal norm is a powerful motivator of environmental behavior (Hopper and Nielson, 1991; Stern and Dietz, 1994; Vining and Ebreo, 1992). The results of standardized coefficient (beta) revealed that personal norm was the most important variable that contributed to the dependent variable that is the consumers' attitudes on green products (beta= 0.408).

6. LIMITATIONS AND FUTURE RESEARCH

In this study, there are some limitations. The results of this research must be used with caution as the sample of the exploratory study is basically undergraduate students. Subsequent study should include a cross section of the Malaysian population. Future research should also include the environmental

knowledge of consumers, as it is essential for the government to understand the environmental knowledge of its people to foster a favorable attitude towards the environment among Malaysian consumers. Also, additional attention need be devoted to examine the effects of perceived consumer effectiveness on environmental attitudes. Additionally, the study on the social norms is suggested to be included in the future research to compare its impact with personal norms on the consumers' attitudes towards green products. As the current research is restricted to the investigation on the green product generally, future study should focus on the consumers' attitude and perception on the green label, green packaging and green values or green service on a specific type of green product in the market. Finally, future research should consider including the areas of green purchase intention and green buying commitment.

REFERENCES

- Abdul-Muhmin, A.G. (2007). Exploring consumers' willingness to be environmentally friendly. *International Journal of Consumer Studies*, 31, 237-247.
- Allport, G.W. (1935). *Attitudes. In a handbook of social psychology*. Worcester, MA: Clark University Press.
- Blackwell, R.D., Miniard, P.W. and Engel, J.F. (2006). *Consumer behavior*. 10th edition, Thomson Learning, South Western.
- Brown, G. and Haris, C. (1992). The US forest service: Toward the new resource management paradigm? *Society and Natural Resources*, 5, 231-245.
- Chukwuma, C.S. (1998). Environmental issues and our chemical world- The need for a multidimensional approach in environmental safety, health and management. *Environmental Management and Health*, 9(3), 136-43.
- Chyong, H.T, Phang, G, Hasan, H. and Buncha, M.R. (2006). Going green: A study of consumers' willingness to pay for green products in Kota Kinabalu. *International Journal of Business and Society*, 7(2), 40-54.
- D'Souza, C., Taghian, M. and Khosla, R. (2007). Examination of environmental beliefs and its impact on the influence of price, quality and demographic characteristics with respect to green purchase intention. *Journal of Targeting, Measurement and Analysis for Marketing*, 15(2), 69-78.
- D'Souza, C., Taghian, M. Lamb, P. and Peretiatko. R. (2007). Green decisions: Demographics and consumer understanding of environmental labels. *International Journal of Consumer Studies*, 31, 371-376.
- Eagles, P. and Muffitt, S. (1990). An analysis of children's attitudes towards animals. *Journal of Environmental Education*, 21, 41-44.
- Eagly, A.H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ebreo, A., Hershey, J. and Vining, J. (1999). Reducing solid waste: Linking recycling to environmentally responsible consumerism. *Environment and Behavior*, 31, 107-134.
- Elkington, H. and Makower. (1988). *The green consumers*. New York: Penguin Books.
- Ferber, R. (1977). Research by convenience. *Journal of Consumer Research*, 1, 57-58.

- Fergus, J. (1991). Anticipating consumer trends. In David, A.R. (Ed.). *The greening of businesses*. Cambridge, UK: The University Press.
- Gallup, G. Jr. and Newport, F. (1990). Americans strongly in tune with the purpose of earth day 1990. *Gallup Poll Monthly*, 295, 5-14.
- Getzner, M. and Krauter, S.G. (2004). Consumer preferences and marketing strategies for "Green Shares": A specifics of the Austrian market. *The International Journal of Bank Marketing*, 22 (4), 260-278.
- Green, S. B. and Salking, N.J. (2008). *Using SPSS for Windows and Macintosh: Analyzing and understanding data*. 5th edition, Pearson International Edition.
- Grunert, S. (1993) Everybody seems concern about the environment but is this concern reflected in (Danish) consumers' food choice? *European Advances in Consumer Research*, 1, 428-433.
- Gurau, C. and Ranchhod, A. (2005). International green marketing: A comparative study of British and Romanian firms. *International Marketing Review*, 22(5), 547-561.
- Haron, S.A., Paim, L. and Yahaya, N. (2005). Towards sustainable consumption: An examination of environmental knowledge among Malaysians. *International Journal of Consumers Studies*, 29(5), 426-436.
- Hair, J. F., Anderson, R.E., Tatham, R.L., and Black, W.C. (1998). *Multivariate Data Analysis*. Englewood Cliffs, NJ: Prentice Hall.
- Harrison, E.B. (1993). *Going green: How to communicate your company's environmental commitment*. Homewood, IL: Richard, D. Irwin, Inc.
- Hopper, J.R. and Nielsen, J.M. (1991). Recycling as altruistic behavior: Normative and behavioral strategies to expand participation in a community recycling program. *Environment and Behavior*, 23, 195-220.
- Igbaria, M., Iivari, J. and Maragahh, H. (1995). Why do individuals use computer technology? A Finnish case study. *Information and Management*, 5, 227-238.
- Irland, L.C. (1993). Wood producers face green marketing era: Environmentally Sound Products. *Wood Technology*, 120 -134.
- Kalafatis, S.P., Pollard, M., East, R. and Tsogas, M.H. (1999). Green marketing and Ajzen's Theory of Planned Behavior: A cross-market examination. *Journal of Consumer Marketing*, 16, 441-460.
- Kassaye, W. W. (2001). Green dilemma. *Marketing Intelligence & Planning*, 19 (6), 444-55.
- Krause, D. (1993). Environmental consciousness: An empirical study. *Journal of Environment and Behavior*, 25(1), 126-42.
- Mainieri, T., Barnett, E., Valdero, T., Unipan, J., and Oskamp, S. (1997). Green buying: The influence of environmental concern on consumer behavior. *Journal of Social Psychology*, 137, 189-204.
- Mansaray, A. and Abijoye, J.O. (1998). Environmental knowledge, attitudes and behavior in Dutch secondary school, *Journal of Environmental Education*, 30(2), 4-11.
- Martin, B. and Simintiras, A.C. (1995). The impact of green product lines on the environment: Does what they know affect how they feel? *Marketing Intelligence and Planning*, 13 (4), 16-23.
- McDaniel, S. and Rylander, D. (1993). Strategic green marketing. *Journal of Consumer Marketing*, 10, 4-10.

- 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, 220-229.
- Ottman, J. (1992). Sometimes consumers will pay more to go green. *Marketing News* (July 6), 16.
- Peattie, K. (1995). *Environmental marketing management*, London: Pitman Publishing.
- Pujari, D. and Wright, G. (1996). Developing environmentally-conscious product strategy: A qualitative study of selected companies in Britain and Germany. *Marketing Intelligence and Planning*, 14(1), 19-28.
- Ramlogan, R. (1997). Environment and human health: A threat to all. *Environmental Management and Health*, 8, 51-66.
- Ramsey, C.E. and Rickson, R.E. (1976). Environmental knowledge and attitudes. *Journal of Environmental education*, 8, 10-18.
- Samdahl, M.E. and Robertson, R. (1989). Social determinants of environmental concern: Specification and test of the model. *Environmental and Behavior*, 21(1), 57-81.
- Schultz, P.W. and Zeleny, L.C. (2000). Promoting environmentalism. *The Journal of Social Issues*, 56, 443-457.
- Schuessler, K. (1971). *Analyzing social data*. Boston, MA: Houghton Mifflin.
- Schweper, C.H. and Cornwell, T.B. (1991). An examination of ecologically concerned consumers and their intention to purchase ecologically packaged products. *Journal of Public Policy and Marketing*, 10, 77-101.
- Shamdasani, P., Chon-Lin, G. and Richmond, D. (1993). Exploring green consumers in an oriental culture: Role of personal and marketing mix. *Advances in consumer research*, 20, 488-493.
- Soonthonsmai, V. (2007). Environmental or green marketing as global competitive edge: Concept, synthesis, and implication. *EABR (Business) and ETLC (Teaching) Conference Proceeding, Venice, Italy*.
- Soontonsmai, V. (2001). *Predicting intention and behavior to purchase environmentally sound or green products among Thai consumers: An application of the Theory of Reasoned Action*, Unpublished Doctor of Philosophy, Nova Southeastern University.
- Stern, P.C. and Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues*, 50, 65-84.
- Straughan, R.D. and Robberts, J.A. (1999). Environmental segmentation alternatives: A look at green consumer behavior in the new millennium. *Journal of Consumer Marketing*, 16(6), 558-75.
- Tanner, C. and Kast, S.W. (2003). Promoting sustainable consumption: Determinants of green purchases by Swiss consumers. *Psychology & Marketing*, 20(10), 883-902.
- Tantawi, P., O'Shaughnessy, N., Gad, K. and Raghed, M.A. (2007). Attitude towards the environment: An empirical investigation on Egyptian consumers. *International Conference on Business and Information Proceedings*, Tokyo, Japan.
- Tikka, P., Kuitunen, M. and Tynys, S. (2000). Effects of educational background on students' attitudes, activity levels, and knowledge concerning the environment. *Journal of Environmental Education*, 31, 12-19.

- Vining, J. and Ebreo, A. (1992). Predicting recycling behavior from global and specific environmental attitudes and changes in recycling opportunities. *Journal of Applied Social Psychology*, 22, 1580-1607.
- Wasik, J.F. (1996). *Green marketing and management: A global perspective*. Cambridge, Mass: Blackwell Publishers Inc.
- Welford, R. (2000). *Hijacking environmentalism*. London: Earthscan.
- Wiener, J.L. and Sukhdial, A. (1990). Recycling of solid waste: Directions for future research, In A. Parasuraman et al. (Eds.). *AMA Summer Educators' Conference Proceedings, American Marketing Association (1: 389-392)*. Chicago:IL.

TABLES

Table 1: Studies on Green Consumers

Author	Percentage of green consumers
1. Starch (1999)	There were an estimated 15% green consumers worldwide.
2. Curlo (1999)	In UK, 10% were recognized as being hardcore green consumers.
3. Phillips (1999)	In America, 50% claim to look for environmental labels and to switch brands based on environmental friendliness.
4. Suchard and Polonsky (1991)	In Australia, 61.5% of the respondents would pay more for environmentally safe products and more willing to pay between 15% and 20% more.
5. Prothero (1990)	In Britain, 27% were prepared to pay up to 25% more for green products

Source: 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*.

Table 2: Reliability of independent and dependent variables

Construct	No. of Items	Cronbach Alpha
Environmental attitudes	20	0.801
Attitudes toward green products	2	0.782

Table 3: T-test results of attitudes on environment and green products by gender (n= 184)

Variables	Male (Mean)	Female (Mean)	Significance	Finding
Attitudes on environment	3.88	3.92	0.465	Not Significant
Attitudes on green product	3.56	3.61	0.547	Not Significant

Table 4: Factor analysis and scale reliabilities

Independent variables	Items	Factor loading	Number of items	Reliability
Factor 1: Environmental protection	<ul style="list-style-type: none"> • If all of us, individually, made a contribution to environmental protection, it would have a significant effect. • Everyone is responsible for protecting the environment in their everyday life. • Citizens should recycle their household waste. • The increasing deterioration of the environment is a serious problem. • Preserving and protecting the environment should be one of our priorities. 	<p>0.698</p> <p>0.689</p> <p>0.623</p> <p>0.622</p> <p>0.607</p>	5	Cronbach's Alpha 0.845
Factor 2: Government's role	<ul style="list-style-type: none"> • The Government should subsidize research on technology for recycling waste products. • Government should enforce environmental rules and regulations. • It makes me angry that the government does not do more to control pollution of the environment. 	<p>0.711</p> <p>0.621</p> <p>0.532</p>	3	Cronbach's Alpha 0.727
Factor 3: Personal norm	<ul style="list-style-type: none"> • Environmental issues are very important to me. • We should do our best efforts to save limited natural resources from being used up. 	<p>0.708</p> <p>0.529</p>	2	Cronbach's Alpha 0.661

Table 5: Result of Regression Analysis

Dependent variable: Attitude on green product			
	Standardized Coefficient (beta)	t-value	Significance
Constant		3.726	0.000
Factor 1: Environment Protection	-0.071	-0.828	0.409
Factor 2: Government's role	0.171	2.163	0.032
Factor 3: Personal Norm	0.408	5.241	0.000
R Square = 0.209 Adjusted R Square = 0.196		F-Value = 15.834 Significance = 0.000	

Table 6: Collinearity Statistics (tolerance and VIF value)

	Tolerance	VIF
Environment Protection	0.594	1.682
Role of Government	0.700	1.428
Personal Norm	0.726	1.378