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Market segmentation of green consumers in Hong Kong

Abstract

Market segmentation is one of the useful tools for marketers to define target markets. An intercept sample survey of 704 shoppers in Hong Kong was conducted to segment the market based on the past purchase of environmentally friendly as well as not-so-friendly products. Chi-square analysis and stepwise discriminant analysis were conducted to differentiate heavy and light green consumers using demographics and other environmental variables including green consumerism knowledge and perception about environmentally friendly products. It was found that heavy green consumers were more likely to have a higher education and a higher household income. They perceived that environmentally friendly products were good for their health and helped to save resources. Heavy green consumers were more likely to report that they perceived influence from other persons, the government and the green groups. They had a strong self-identity and think of themselves as green consumers and as someone who was concerned with environmental issues. They possessed a better knowledge about green consumerism and more frequently used the mass media for environmental news. Light green consumers found environmentally friendly products difficult to access. Implications for green marketers and manufacturers are discussed.

1. Introduction

The concern for environment has become an important issue that influences the production, distribution and disposal of many commercial products. As the public realize that consumption activities lead to environmental problems, some consumers are translating their environmental concern into actively purchasing green products ([Kangun, Carlson, and Grove, 1991](#)). Consumers' consideration of environmental issues in their purchases and their willingness to pay a premium price have led marketers to identify the environment as a key market opportunity ([Bohlen, Schlegelmilch and Diamantopoulos, 1993](#); [Ottman, 1992](#)). The number of green products increased tremendously and constituted 9.2 percent of all new product introductions in the United Kingdom in the first half of 1990 ([Salzman, 1991](#)). Consumers in Western countries often encounter product claims of "eco-friendliness", "biodegradable", and "recyclable" ([Olney and Bryce, 1991](#)).

Market segmentation is a common tool used by marketers to look for classes of buyers who have similar needs and can be communicated to with similar messages ([Belch and Belch, 1995](#)). Most of the previous research on green consumers has been conducted in North America and Western Europe. There is little research on the profiles of green consumers in Asian countries. As a diverse society where East meets West, Hong Kong provides a great challenge for international marketers. The private consumption expenditure figures in Hong Kong was HK\$806.0 billion (equivalent to HK\$103 billion) in 1997. It will encourage manufacturers and traders to offer more environmental alternative products if there is an

overall increase in environmental concern by Hong Kong consumers.

This study attempts to segment the Hong Kong consumers according to the level of their environmental concerns in purchase decisions. How the segments differ provides marketers and traders with valuable information for developing marketing and communication strategies.

2. Literature review

Profiles of green consumers

This section summarizes previous research on green consumers conducted in North America, Europe and Asia. Efforts to identify environment friendly consumers can be traced back to the early 1970s. In many studies, eco-sensitive consumers are found to be different from their counterparts in terms of demographic as well as other social/psychological variables. For example, research findings indicated that green consumers had a higher income and a higher social status (Kinneer, [Taylor and Ahmed, 1974](#); [Simon, 1992](#); [Tucker, Dolich and Wilson, 1981](#)). Green consumers in Britain were more likely to be female, middle aged and living in rural areas ([Prothero, 1990](#)). However, people living in larger American cities were found to be more concerned about pollution than those living in smaller cities and were more likely to purchase ecologically packaged products ([Schwepker and Cornwell, 1991](#)). Green consumers in France were found to be younger and more educated ([Jolibert and Baumgartner, 1981](#)). [Leelakulthanit and Wongtada \(1993\)](#) found that green consumers in Bangkok had a higher education and income level. However, there was no difference in

marital status and gender of green and non-green consumers in Bangkok. In a survey conducted in Singapore, Shamdasani, Chon-Lin and Richmond (1993) found that there were no demographic differences between green and non-green consumers. [Granzin and Olson \(1991\)](#) argued that the greater concern for environmental issues has driven members of all demographics to a willingness to participate in environmental activities. As a result, the discriminating power of demographic variables decreases.

To summarize, green consumers tends to be better educated, higher in income and occupation status, and higher in socioeconomic status.

Other researchers used personality and cultural variables to identify green consumers. [Cornwell and Schwegker \(1995\)](#) summarized the variables investigated in 17 studies conducted in the 1970s and 80s. Green consumers were described as self-controlled, well organized and goal-oriented ([Pettus and Giles, 1987](#)). They were also described as dogmatic, less conservative and alienated ([Anderson and Cunningham, 1972](#); [Belch, 1979](#); [Kinnear and Taylor, 1973](#)).

Consumers' concern for ecology was related to, but was not highly correlated with consumption behavior ([Balderjahn, 1988](#); [Crosby and Taylor, 1982](#); [Kinnear and Taylor, 1973](#)). However, the extent to which the consumer believed her/his action was effective was found to be a useful predictor of the ecologically concerned consumer ([Kinnear, Taylor and Ahmed, 1974](#); [Webster, 1975](#)). Similarly, consumers who believed in the power of the individual bought and used more non-polluting products ([Balderjahn, 1988](#)).

In a Thailand survey, Rice, Wongtada and Leelakulthanit (1996) found that perceived consumer effectiveness was not related to green buying behavior. They argued that Thai consumers did not use buying power as a means to solve the environmental problem because the availability of green products was limited.

Sparks and Shepherd (1992) found that attitudes, perceived social norms, perceived control and self identity as green consumers were significant predictors of intention to consume organic vegetables. Sparks and Shepherd (1992) argued that self-identity embodied moral concerns and affective facets of evaluations that were not captured sufficiently by normal attitudinal measures. Mainieri, Barnett, Valdero, Unipan and Oskamp (1997) found that consumer beliefs (specific attitudes toward green consumerism) was a significant predictor of all three measures of environmental consumerism.

Overall, findings of these studies are somewhat equivocal. It is surprising to find that none of these studies measured consumers' attitudes and beliefs about environment friendly products. None of the studies included green consumerism knowledge and use of environmental news as independent variables to discriminate green consumers from non-green consumers. This study will try to improve in this aspect.

Green consumerism in Hong Kong

The concept of green consumerism is not new to the Hong Kong people. More and more consumers have started to assess the environmental impact of product/service choices and to change their behavior in purchasing, consuming and dispensing of the product (Ting, 1991).

In two large-scale public opinion polls conducted in 1992/93 and 1995, 55% and 47% of Hong Kong citizens respectively said that they were willing to pay more for environment friendly products (Environmental Campaign Committee, 1995). Older people and people with a lower educational level were less willing to pay more for environmentally safe products.

Professional employees, students, and people with higher educational level were more willing to buy green products (Environmental Campaign Committee, 1995). In an intercept sample of 403 Hong Kong consumers in 1992, Chung and Poon (1994) found that paying 5 to 15 percent more for environmental friendly products than ordinary products of the same function was acceptable to 71 percent of the respondents. The higher percentage of people who were willing to pay a green premium than in the United Kingdom could be explained by the more favorable economic situation in Hong Kong (Chung and Poon, 1994). Chung and Poon (1996) found that Hong Kong housewives were less willing to pay more for green products than the Hong Kong general population. Chung and Poon (1996) suggested that housewives were more price-conscious than the general public.

In a survey of 98 Hong Kong shoppers, Chan (1996) found that products in reusable containers, toilet tissues with recycled content and products with least amount of packaging were the most frequently purchased green products.

Based on respondents' evaluation and pre-purchase consideration measures of seven types of environmentally harmful products, Yam-Tang and Chan (1998) classified 552 Hong Kong consumers into two clusters. Cluster one had more consistent responses to their

evaluation and pre-purchase consideration scores. Cluster two ranked the products more for environmental impacts than for pre-purchase considerations. The two clusters differed in gender and occupation. Females, students and housewives were more consistent in their perceptions and actions.

4. Research objectives

The objective of the study is to segment Hong Kong consumers according to their past purchase decisions of environmentally friendly and not-so-friendly products. We aim to find out whether these market segments differ in their demographic profile, perception and attitudes toward environmental friendly products, and their consumption of environmental information.

5. Research methodology

Seven products or product types were chosen because of their relevance to the environment. They were selected from Chan's (1996) study and from four focus group discussions conducted before the survey. The main concern is the reusability and recyclability of the products, and its availability in Hong Kong.

Environment friendly products (EPF) include

- items in reusable containers
- products without over-packaging
- products with refillable package
- products with recycled contents

- products safe to the environment

Not-so-friendly products include

- disposable products
- aerosol spray

Past purchase behavior was measured by asking respondents to report on how frequently they buy these products on a four point scale (1=never, 4=very often). The sum of the purchase of EFP and the reverse sum of the purchase of not-so-friendly products formed the measure of green purchase behavior. The potential range is from 7 to 28.

Perceptions about EFP were measured by asking respondents to rate, on a five-point scale (1=strongly disagree, 5=strongly agree), eight statements about the attributes of EFP including price, quality and availability. The statements came from the same focus group discussions about the main advantages, disadvantages and concerns about EFP. Perceptions toward the purchase of EFP were also measured by having respondent's rate, on a five-point scale, three semantic-differential adjectives: bad-good, dislike-like, difficult-easy.

Perceived social norm is measured by asking respondents to rate on a five-point scale (1=strongly disagree, 5=strongly agree) the following five statements: 'Family members whose opinions are important to me think I should buy EFP', 'Friends whose opinions are important to me suggest that I should buy EFP', 'TV and newspapers content suggest that I should buy EFP', 'Green Groups suggest that I should buy EFP.' and 'The government's publicity campaign suggests that I should buy EFP'. Inter-item reliability (Cronbach's

alpha) for the measure was 0.73. The mean formed the measure of perceived social norm toward purchase of EFP.

Self-identity is measured by asking respondents to rate, on a five point scale (1=strongly disagree, 5=strongly agree), two statements: 'I think of myself as a green consumer', 'I think of myself as someone who is very concerned with environmental issues'. Inter-item reliability (Cronbach's alpha) for the measure was 0.81. The mean formed the measure of self-identity.

Green consumerism knowledge was measured by five questions regarding comprehension of two environmental claims and three green labels commonly used by local and international advertisers, manufacturers and marketers. There are three main types of voluntary eco-label schemes adopted in the international consumer markets, including the seal-of-approval programs, single attribute certification and environmental report cards (Centre of Environmental Technology and Hong Kong Productivity Council, 1997). The seal-of-approval programs were not selected because Hong Kong does not operate such programs and overseas programs are not popular in Hong Kong. Environmental Report Cards were not selected because during the pilot stage, respondents of the focus group discussions found the Cards to be extremely complicated and difficult to understand. Two single attribute certificates were selected for this study. One was the energy efficiency label for electrical appliance operated by the Electrical and Mechanical Services Department. The other one was a Scientific Certifications Systems (US-based) single attribute label on recycled material

content. The latter one has not been adopted in Hong Kong.

Questions were in multiple choice formats. Three choices were given for each question and only one answer was correct. For each correct answer, one point was awarded and no point was awarded or deducted for wrong answers. The sum formed the green consumerism knowledge score. The maximum possible score is five.

Use of mass media for environmental news was measured by asking respondents how frequently they viewed television and read print news about the environment on a four point scale (1=never read, 4=read every time). The mean formed the measure of the use of mass media for environmental news.

The current study was conducted using via personal interviews at major shopping areas of Hong Kong where people from all walks of life were likely to pass by. The target population was Hong Kong residents who were major decision-makers of household and consumer goods. Sample was selected based on a quota set on gender and age. The quota was compiled by taking the average of the gender/sex profile of the Hong Kong population and the gender/sex profile of shopping decision makers obtained from AC Nielsen (China) Limited. Altogether 704 interviews were conducted during the period May 26 to June 15, 1998. Slightly over two third of the sample were female. Housewives and clerical services/sales employees each contributed one quarter of the sample. The rest of the sample was managerial and professional employees (20 percent), unemployed and retired (12 percent), students (7 percent) and production and other workers (10 percent). The median age was 36 years.

Seventy percent of the sample had secondary or above education. The median monthly household income of the sample was HK\$25,100 (equivalent to US\$3,200), which was 43 percent higher than that of the Hong Kong population of HK\$17,500 (Census and Statistics Department, 1996).

6. Findings

Table 1 lists the frequency, mean and standard deviation for past green purchase behavior. It reflects consumers' preference as well as the availability of green alternatives in the retail market. Products in reusable containers, products without over-packaging and products with refillable package received the top three positions for EFP with mean values 2.8, 2.7 and 2.7 respectively. Consumers never or seldom bought products with recycled content. This is probably because these products are not common in the consumer market. For example, recycled paper is seldom sold in ordinary stationery shops. For the two not-so-friendly products, the mean score of past purchase occupied the fourth and fifth positions in the ranking with values 2.6 and 2.6 respectively.

The measure of green purchase behavior scored from 9 to 26, with the mean value 17.6. Thirty-five percent of respondents scored 9 to 16. They were classified as 'light' green consumers. Thirty-eight percent of respondents scored 17 to 19. They were classified as 'medium' green consumers. The rest, twenty-seven percent of the respondents, scored higher than 20. They were classified as 'heavy' green consumers.

Table 2 shows the demographic distribution of light, medium and heavy green consumers. Chi-square results indicated that they did not differ in gender, age and housing

type. However, past green purchase behavior was found to be statistically dependent on education ($p < 0.0001$), occupation ($p < 0.05$) and household income ($p < 0.05$). Heavy green consumers were more likely to have a higher education and a higher household income. Managerial and professional workers and students were more likely to be heavy green consumers. Unemployed and retired people, and housewives were less likely to be heavy green consumers.

Table 3 shows the perceptions of EFP among light, medium and heavy green consumers. F-tests results indicated that light, medium and heavy green consumers differed greatly in their perceptions of EFP and evaluation of purchase of EFP. Nine out of eleven F-statistics showed a significant difference. Heavy green consumers reported that they liked to buy EFP and buying EFP was considered good and easy. They strongly believed that EFP were good to their health and helped to save resources. However, they did not agree that buying EFP were trendy. It seems that green purchase is driven by perceived benefits to themselves and the global environment, rather than considering it as a fashionable lifestyle. Light green consumers perceived that EFP were difficult to access, more expensive and did not have a better quality. All consumers agreed that EFP allowed less choice and they did not place much doubt on the credibility of the environmental claims.

Table 4 shows the perceived social norms among light, medium and heavy green consumers. F-tests results indicated that light, medium and heavy green consumers had a great difference in their perceived social norms. All the five F-statistics showed significant

differences. Heavy green consumers were more likely to report that they perceived influence from friends, family members and green groups. Light green consumers were less likely to report that they perceived influence from government's publicity campaigns and mass media contents.

Table 5 shows the self-identity, green consumerism knowledge and use of environmental news among light, medium and heavy green consumers. F-tests results indicated that they had a significant difference. Heavy green consumers scored higher in self-identity. They were more likely to think of themselves as green consumers and as someone who was concerned with environmental issues. Heavy green consumers also scored higher in green consumerism knowledge and reported that they read and watched more about environmental news in print and on television.

Stepwise discriminant analysis was conducted to identify the cognitive and psychological variables that differed most significantly between 'light' and 'heavy' green consumers. In the sample, there were 203 light green consumers and 144 heavy green consumers. Altogether twenty-one cognitive and social-psychological variables were used as predictors. These include eleven items on perception about EFP and buying of EFP, five items on perceived social norms, two items on self-identity, two items of use of media for environmental news and one score for green consumerism knowledge. The ratio of observation to independent variables was 17:1 and was close to the suggested ratio of 20 to 1 (Hair et. al., 1995).

Table 6 summarized the results of the stepwise discriminant analysis. Ten out of the twenty-one independent variables produced statistically significant canonical functions. It was a good mix of items from perception, perceived social norms, self-identity, use of media and knowledge scales. None of a specific social or psychological or cognitive concept dominated in the canonical functions. Examination of the standardized canonical discriminant function coefficients reviews the discriminating contribution attributable to individual variable. It was found that perceived accessibility of EFP, the affection toward buying of EFP and perceived influence of green groups produced the greatest discriminating power. Light green consumers were more likely to find EFP difficult to access, dislike buying EFP and not perceiving influence from green groups. The hit rate utilizing the discriminant function was 73.7 percent, which was higher than the proportional chance criterion of 51.4 percent.

7. Discussions and conclusion

The results supported that Hong Kong consumers occasionally bought green consumers. Green products were not brand new to Hong Kong consumers. Both demographic variables and attitudinal/cognitive variables were useful to differentiate green consumption level in Hong Kong. In terms of the demographic variables, environment friendly consumers in Hong Kong were more likely to have a higher education. This may be because they are more capable of processing environmental information carried by the products and differentiating them from less-friendly alternatives. Heavy green consumers enjoyed a higher household

income. The demographic profile of green consumers in Hong Kong was very similar to that of the green consumers in the West. So, environment friendly product marketers may aim at the affluent and the elite classes as their prime target.

Simply developing green products is not sufficient. Green consumers differed much in their perception and evaluation of EFP. Heavy green consumers considered buying EFP good and they liked to buy EFP. They perceived EFP as something good to their health and the globe. Green consumers were concerned about the health of themselves and the physical environment. Marketers should use these benefits as the major selling proposition to promote green products. Marketers should effectively communicate to green consumers how they or the environment will gain from using a specific product. Some companies have attempted to project an image that green consumers are trendy. The findings in the current study showed that green consumers did not want to be perceived as trendy. This may be because 'trendy' action is short-term and does not represent a long-term commitment. Marketers should take caution in the communication strategy.

The perception of light green consumption shed light on the hindrance of the promotion of green products. Light green consumers found EFP difficult to access and perceived that buying EFP was a trendy behavior. Light green consumers perceived that EFP did not have a better quality and were more expensive. Manufacturers should improve the quality and cost performance of EFP to compete in the market. Manufacturers should also provide a fuller variety of product choices and green consumers do not need to sacrifice diversity for

environmental considerations. Improve the accessibility of EFP is a key element to promote EFP. The marketers may consider present more EFP and make them more visible. Re-design the product and its packaging, inclusion of prominent environmental message, environmental performance and eco-labels are possible strategies to make EFP stand out among the crowds. Consumer Council should conduct more product tests and inform consumers on the environmental and quality features of products. This will help consumers to put environmental consideration a higher priority in their purchase decisions.

Heavy green consumers were more likely to perceive influence from friends and green groups to buy EFP. The result suggests that an emphasis upon normative influence of peer and institutional pressure may be an appropriate appeal in advertising and publicity efforts. Celebrities or green opinion leaders may be used to endorse green products in marketing communication campaigns.

Self-identity, green consumerism knowledge and use of mass media for environmental news serve as important differentiating variables for green consumerism. A clear and healthy image of a green consumer will be useful to promote green products. Future research is needed to explore what sort of image people have about green consumers. As heavy green consumers have a stronger self-identity as 'someone who concerns about green issues', marketers should cultivate a general concern of the environmental condition in the world and in Hong Kong. This can be done by including environmental performance in their annual reports, sponsoring environmental columns in local newspapers and magazines, publishing

newsletters to inform the public on new types of green products and new development of environmental technology. The result that heavy green consumers scored higher in green consumerism knowledge and use of mass media is encouraging. The government and the Consumer Council should consider developing mass publicity campaigns to educate consumers about the use of environmental labels and other related information for purchase decisions.

Consumers' perception about EFP may change when they start using them. To justify the additional cost for the EFP, green consumers may develop attitudes and beliefs congruent with their behaviors. In this way, the explanatory variables will reflect the effect of buying EFP rather than a cause. This is always a limitation of any cross-sectional study. Future longitudinal study to track the change of consumers' perception of EFP with the change of green consumption level will be useful tool to overcome this limitation.

To conclude, attitudinal and demographic variables are useful for market segmentation of green consumers in Hong Kong. Marketers should put an emphasis on the perceived benefits and improve on the perceived shortcomings of environmental friendly products. A suitable use of personal and institutional social pressure and the establishment of a concrete self-identity image are appropriate marketing communication strategies.

References

- Anderson, W.T., Jr. and Cunningham, W.H. (1972) Socially conscious consumers. *Journal of Marketing*, 36 July, 23-31.
- Balderjahn, I. (1988) Personality variables and environmental attitudes as predictors of ecologically responsible consumption patterns. *Journal of Business Research*, 17(August), 51-56.
- Belch, M.A. (1979) Identifying the society and ecologically concerned segment through life-style research: Initial findings. In Henion, K.E. and Kinnear, T. (Eds.), *The Consumer Society*. Chicago, Illinois: American Marketing Association.
- Belch, G.E. and Belch, M.A. (1995) *Introduction to advertising and Promotion: An integrated marketing communication perspective, third edition*. Boston, Mass: Irwin/McGraw-Hill.
- Bohlen, G., Schlegelmilch, B.B. and Diamantopoulos, A. (1993) Measuring ecological concern: A multi-construct perspective. *Proceedings of the Marketing Education Group Annual Conference: Emerging Issues in Marketing*, Vol. I, 58-70.
- Chan, T.S. (1996) Concerns for environmental issues and consumer purchase preferences: A two-country study. *Journal of International Consumer Marketing*, 9(1), 43-55.
- Chung, S.S. and Poon, C.S. (1994) Hong Kong citizens' attitude towards waste recycling and waste minimization measures. *Resources, Conservation and Recycling*, 10, 377-400.
- Chung, S.S. and Poon, C.S. (1996) The attitudinal differences in source separation and waste reduction between the general public and housewives in Hong Kong. *Journal of Environmental Management*, 48, 215-227.
- Cornwell, T.B. and Schepker, C.H., Jr. (1995) Ecologically concerned consumers and their product purchases. In M. J. Polonsky and A. T. Mintu-Wimsatt (Eds.) *Environmental Marketing: Strategies, Practice, Theory, and Research*, New York: Haworth Press, Inc.
- Crosby, L.A.. and Taylor, J.R. (1982) Consumer satisfaction with Michigan's container deposit law: An ecological perspective. *Journal of Marketing*, 46 (Winter), 47-60.

- Environmental Campaign Committee (1995) *Survey on Community Attitudes to the Environment 1995*, Social Science Research Centre, The University of Hong Kong.
- Granzin, K.L. and Olson, J.E. (1991) Characterizing participants in activities protecting the environment: A focus on donating, recycling, and conservation behaviors. *Journal of Public Policy and Marketing*, 10(2), 1-27.
- Hair, J.F. Jr., Anderson, R.E., Tatham, R.L., and Black, W.C. (1995) *Multivariate data analysis with readings: fourth edition*, NJ: Prentice-Hall.
- Jolibert, A. and Baumgartner, G. (1981) Toward a definition of the consumerist segment in France, *Journal of Consumer Research*, 8 June, 114-117.
- Kangun, N., Carlson, L. and Grove, S. J. (1991) Environmental advertising claims: a preliminary investigation, *Journal of Public Policy and Marketing*, 10(2), 45-58.
- Kinnear, T.C. and Taylor, J.R. (1973) The effects of ecological concern on brand perceptions. *Journal of Marketing Research*, 10, 191-197.
- Kinnear, T.C., Taylor, J.R. and Ahmed, S.A. (1974) Ecologically concerned consumers: Who are they? *Journal of Marketing*, 38 April, 20-24.
- Leelakulthanit, O. and Wongtada, N. (1993) Thai consumer behavior: Responses in Conserving the environment. In Gerald S. Albaum et.al. (Eds.), *Fourth Symposium on Cross-Cultural Consumer and Business Studies*.
- Mainieri, T., Barnett, E.G., Valdero, T.R., Unipan, J.B. and Oskamp, S. (1997) Green buying: The influence of environmental concern on consumer behavior. *Journal of Social Psychology*, 137(2), 189-204.
- Olney, T.J. and Bryce, W. (1991) Consumer responses to environmentally based product claims. In R.H. Holman and M.R. Solomon (Eds.), *Advances in Consumer Research*, Volume 18, 693-696.
- Ottman, J. (1992) Sometimes consumers will pay more to go green, *Marketing News*, 6 July, 16.
- Pettus, A.M. and Giles, M.B. (1987) Personality characteristics and environmental attitudes.

Population and Environment, 9(3), 127-137.

Prothero, A. (1990) Green consumerism and the societal marketing concept – Marketing strategies for the 1990s. *Journal of Marketing Management*, 6(2), 87-103.

Rice, G., Wongtada, N. and Leelakulthanit, O. (1996) An investigation of self-efficacy and environmentally concerned behavior of Thai consumers. *Journal of International Consumer Marketing*, 9(2), 1-18.

Salzman, J. (1991) Green labels for consumers. *OECD Observer*, Vol. 169, April/May, 28-30.

Schwepker, C.H., Jr. 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(2), 77-101.

Shamdasani, P., Chon-Lin, G.O. and Richmond, D. (1993) Exploring green consumers in an oriental culture: Role of personal and marketing mix factors. In McAlister, L. and Rothschild, M.L. (Eds.), *Advances in Consumer Research*, Volume 20, Provo, UT: Association for Consumer Research.

Simon, F. (1992) Marketing green products in the Triad. *Columbia Journal of World Business*, 27 Fall and Winter, 268-285.

Sparks, P. and Shepherd, R. (1992) Self-identity and the theory of planned behavior: Assessing the role of identification with “green consumerism”. *Social Psychology Quarterly*, 55(4), 388-399.

Yam-Tang E.P.Y. and Chan, R.Y.K. (1998) Purchase behaviours and perceptions of environmentally harmful products. *Marketing Intelligence and Planning*, 16(6), 356-362.

Ting, J.S. (Ed.) (1991) *Towards a Sustainable World*, Hong Kong: Urban Council.

Tucker, L.R. Jr., Dolich, I. And Wilson, D. (1981) Profiling environmentally responsible consumer citizens. *Journal of the Academy of Marketing Science*, Fall, 454-478.

Webster, F.E., Jr. (1975) Determining the characteristics of the socially conscious consumer. *Journal of Consumer Research*, 2 (December), 188-196.

Table 1 Past purchase behavior of environment friendly products (EFP) and not-so-friendly products

Frequency of purchase	never	seldom	occasional	very often	Mean*	SD
	%	%	%	%		
items in reusable containers	7.1	28.0	47.2	17.7	2.8	0.8
products without over-packaging	5.4	35.4	42.9	16.3	2.7	0.8
products with refillable package (such as detergent, liquid soap)	11.1	29.4	38.8	20.7	2.7	0.9
products safe to the environment	11.4	39.0	41.1	8.5	2.5	0.8
products with recycled content	20.8	41.0	35.8	2.4	2.2	0.8
disposable products	4.4	42.5	42.9	10.3	2.6	0.7
aerosol spray	5.3	37.2	45.0	12.5	2.6	0.8

*on a four-point scale with 1=never and 4=very often

Table 2 Demographics and past green purchase behavior

Demographics	Past green purchase			Chi-square stat.	Sign. level
	Light (1) %	Medium (2) %	Heavy (3) %		
Gender				1.1	N.S.
Male	34.5	30.3	32.9		
Female	65.5	70.0	67.1		
Age				13.1	N.S.
19 or below	9.1	11.4	11.8		
20-29	21.0	19.9	20.6		
30-39	24.9	27.1	34.7		
40-49	17.4	17.8	18.8		
50+	27.7	23.8	14.1		
Education				24.1	<0.0001
Primary or below,	35.1	26.8	21.9		
Secondary	44.2	40.4	40.2		
Matriculated	11.2	14.6	12.4		
Diploma, degree or above	9.6	18.2	25.4		
Housing type				5.5	N.S.
Public housing	39.4	35.7	29.5		
Home Ownership Scheme housing	18.5	19.1	21.1		
Private housing	34.1	37.9	38.6		
Village or others	8.0	7.2	10.8		
Occupation					
Housewives	26.5	23.6	22.4		
Clerical, service and sales	28.5	28.6	30.0		
Managerial, executives and administrative employees	8.0	11.4	11.8		
Professionals and sub-professionals	7.2	9.3	15.3		
Production and construction	7.6	4.6	3.5		
Unemployed and retired	16.9	15.0	7.1		
Students	5.2	7.5	10.0		
Monthly household income (HKD)				16.3	<0.05
<15,000	24.4	14.7	16.1		
16,000-25000	34.7	36.7	23.4		
26,000-35,000	22.2	25.1	32.1		
36,000+	18.8	23.6	28.5		

Table 3 Perception about environmental friendly products (EFP) and past green purchase behavior

Perception about EFP	Past green purchase			F-stat.	Sign. level	Duncan pair-wise test
	Light (1)	Medium (2)	Heavy (3)			
Like/dislike buying EFP	3.0	3.2	3.6	29.2	<0.0001	3>2, 2>1
Buying EFP is bad/good	3.6	3.8	4.0	19.7	<0.0001	3>2, 2>1
Buying EFP is difficult/easy	2.7	2.9	3.2	14.0	<0.0001	3>2, 2>1
Using EFP is good to our health	3.3	3.4	3.7	10.0	<0.0001	3>1, 3>2
EFP help to save resources	3.8	3.9	4.1	5.2	<0.01	3>1, 3>2
EFP are difficult to access	3.4	3.1	3.1	5.1	<0.01	1>2, 1>3
Buying EFP is trendy	3.1	3.1	2.9	4.9	<0.01	1>3, 2>3
EFP have better quality	2.7	2.9	3.0	4.8	<0.01	3>1, 2>1
EFP are more expensive	3.4	3.2	3.2	4.5	<0.05	1>2, 1>3
EFP have less choices	3.6	3.5	3.5	2.1	N.S.	
Buying EFP can be cheated easily by manufacturers	3.0	2.9	2.9	1.9	N.S.	

On five-point scale with higher number indicating strongly agree

Table 4 Perceived social norm and past green purchase behavior

Perceived social norms	Past green purchase			F-stat	Sign. level	Duncan pairwise test
	Light (1)	Medium (2)	Heavy (3)			
family members that are important to me suggest that I should buy EFP	15.5	16.0	17.1	14.9	<0.0001	3>2, 2>1
friends that are important to me suggest that I should buy EFP	2.7	2.8	3.0	8.0	<0.0005	3>1, 3>2
government's publicity campaign suggest that I should buy EFP	2.6	2.7	3.0	11.8	<0.0001	3>1, 3>2
TV and newspaper contents suggest that I should buy EFP	3.3	3.5	3.6	5.2	<0.01	3>1, 2>1
green groups suggest that I should buy EFP	3.2	3.3	3.4	4.4	<0.05	3>1, 2>1
	3.7	3.8	4.0	7.9	<0.0005	3>1, 3>2

Table 5 Self-identity, environmental knowledge, use of environmental news and past green purchase behavior

Item	Scale	Past green purchase			F-stat	Sign. level	Duncan pairwise test
		Light (1)	Medium (2)	Heavy (3)			
Self-identity	2-10	5.2	5.7	6.3	29.6	<0.0001	3>2,2>1
I think of myself as a green consumer	1-5	2.6	2.8	3.1	21.5	<0.0001	3>2,2>1
I think of myself as someone who is very concern with environmental issues	1-5	2.6	2.9	3.2	28.1	<0.0001	3>2,2>1
Green consumerism knowledge	0-5	2.6	2.6	3.1	6.9	<0.005	3>2,3>1
Use of print media for environmental news	1-5	1.9	2.0	2.3	19.1	<0.0001	3>2,2>1
Use of TV for environmental news	1-5	2.0	2.1	2.3	12.3	<0.0001	3>2,2>1

Table 6 Summary of light/heavy green consumers Stepwise discriminant analysis results

Step	Variable entered	Wilks' value	Lambda Significance	Partial R square
1	like buying EFP	0.879	0.0001	0.122
2	I think of myself as someone who is very concern with env. issues	0.835	0.0001	0.050
3	EFP are difficult to access	0.804	0.0001	0.037
4	green groups suggest that I should buy EFP	0.782	0.0001	0.028
5	green consumerism knowledge	0.766	0.0001	0.018
6	read print media for env. news	0.760	0.0001	0.010
7	using EFP us good to our health	0.752	0.0001	0.010
8	buying EFP is trendy	0.746	0.0001	0.008
9	friends that are important to me suggest that I should buy EFP	0.739	0.0001	0.009
10	buying EFP can be cheated easily by manufacturers	0.735	0.0001	0.006

Standardized canonical discriminant function coefficients

Independent variable	Coefficient
like buying EFP	0.429
I think of myself as someone who is very concern with environmental issues	0.220
EFP are difficult to access	-0.455
green groups suggest that I should buy EFP	0.313
green consumerism knowledge	0.217
read print media for environmental news	0.239
using EFP us good to our health	0.256
buying EFP is trendy	-0.264
friends that are important to me suggest that I should buy EFP	0.210
buying EFP can be cheated easily by manufacturers	0.173

Number of observations and percent classified into:

from	Light green con.	Heavy green con.	Total
Light green con.	148 (72.9%)	55 (27.1%)	203 (100.0%)
Heavy green con.	36 (25.0%)	108 (75.0%)	144 (100.0%)
Total	184 (100.0%)	163 (100.0%)	347 (100.0%)

Percentage correctly classified = $256/347 = 73.7\%$

Summary on response to reviewers' comment

Reviewer 1's comment and page reference on original manuscript	Revision and page reference on revised manuscript
Add marketers' implication, p.12	Added on p.13 last paragraph on making EFP more visible
Criteria used for sample selected, p.9	Elaborated on p. 9
Reviewer 2's comment	
Clarify 'products for single use' on p.7	Replaced by 'disposable products' on p.7
Add discriminant analysis of heavy and light green consumers	Stepwise discriminant analysis was conducted and the results were reported on p.12 and Table 6 and discussed Abstract was revised
Clarify on confusing terms and casual language, p.10 and p.11	Wordings revised
Explanatory variables reflecting the effect of buying EFP, rather than a cause	Point out as a limitation in p.14

Market segmentation of green consumers in Hong Kong

Executive summary

A survey was conducted in Hong Kong to help marketers to identify consumers with the highest potential for green products. Results indicated that like the western world, heavy green consumers in Hong Kong were better educated and enjoyed a higher household income.

Heavy and light green consumers differed in their perception of environmental friendly products, their self-identity and knowledge about green consumerism. Light green consumers found green products difficult to access, expensive and did not deliver a better quality. Heavy green consumers liked buying green products and they perceived them good to health and help saving global resources. Heavy green consumers also thought of themselves as someone who was concerned with environmental issues. Nearly all consumers perceived that green products had less choice. The good news is Hong Kong consumers are not critical about environmental claims made by manufacturers.

To expand the green market, manufacturers should improve the quality and cost performance of green products. They should provide a fuller variety of product choices. Improving the accessibility of green products is a key element for marketers. Marketers should present more green products and make them more visible. Re-design the product and its packaging, inclusion of environmental message and inclusion of eco-labels are possible strategies. Marketers should also promote a general concern of the environment using public relations tactics including environmental reporting, sponsoring environmental columns in

print media and inform the public on new types of green products.