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CLASSIFYING CONSUMERS BASED UPON THEIR PRO-ENVIRONMENTAL BEHAVIOUR: AN EMPIRICAL INVESTIGATION

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ABSTRACT

Despite a wide applicability of demographic and psychographic variables for segmentation criteria, past research indicates that these variables are not as effective as behavioural variables. The present empirical study's focus is determining different typologies of Indian consumers, which exist in terms of Pro-Environmental Behaviour (PEB), and investigating whether PEB varies across these typologies. For this study, a total of 152 Indian consumers were contacted through convenience sampling. Using factor and cluster analysis, the typologies were classified as "active green activists" or "passive green activists". Using discriminant analysis, formed groups were validated and profiled by chi-square. Using environmental variables as the basis of segmentation, this study offers practical guidelines to green marketers who are targeting the Indian markets.

Keywords: segmentation, green marketing, factor analysis, cluster analysis, discriminant analysis, pro-environmental behaviour

INTRODUCTION

Over the past 25 years, marketing's relationship with consumer behaviour and the environment continues to attract researchers' attention and is consequently reflected in numerous green marketing texts (Ottman, 1993; Peattie, 1995; Charter & Polonsky, 1999). A later study outlined that a consumer's purchasing decisions revolve around his or her environmental concerns (Menon, Menon, Chowdhury, & Jankovich, 1999). In late 1990s, businesses started to incorporate this trend in their marketing and management decision-making (Straughan & Roberts, 1999).

Following the trend, businesses have reengineered their marketing mix by inserting green elements in their product profiles (Chitra, 2007) in order to remain competitive. Consequently, consumers have begun to change their purchasing patterns by preferring "environmentally friendly products" or "green products" (hereafter, both terms are referred to as green products). The patterns signal a niche market for consumption of green products that is expanding internationally. This marketing trend and resulting consumer purchasing patterns have favoured a new segment of green or ecological consumers.

Considerable effort has gone into identifying the common needs or patterns in this green marketing arena. Market heterogeneity patterns (Smith, 1956) explain the market segmentation as a fundamental marketing principle (Kotler, 1997) that requires special attention. Suitable "segmentation, targeting and positioning" strategies are equally important aspects to which marketers must take caution as many new businesses enter into green arena. Wind (1978) examined the existing discrepancy between academic research in segmentation and practice. In the marketing literature, the relevance of segmentation approaches used in green marketing has been critiqued according to implementation. In this context, overcoming such implementation issues is vital to the success of market segmentation. The present paper presents a segmentation basis that has been designed to overcome some of these implementation barriers.

Previous studies have supported the argument that traditional market segmentation is not appropriate. For example, Straughan and Roberts (1999) proved that environmental segmentation alternatives are more stable than demographics and psychographic consumer profiles. Examining the available literature, it has been summarised that green marketing researchers devote their attention to many variables such as (a) ecoliteracy, (b) environmental consciousness, (c) perceived behavioural control, (d) willingness to pay for green products, and (e) willingness to pay more.

The distinction within segments from green or non-green consumers can be effectively accomplished by targeting specific and current environmentally friendly behaviours. In fact, consumers are scattered in their levels of displaying various environmentally friendly behaviours. The idea of targeting these environmentally friendly alternatives is reflected in the rise in pro-environmental demand (Newsweek, 2006). Segmentation based on various environmental variables is a growing trend, but research based on PEB is understudied and has yet to be fully explored. Therefore, the present study is performed with an objective that aims to more closely examine environmental variables and specifically PEB for profiling green consumers. Based upon this objective, factor analysis, and their background information, the consumers will be grouped and

profiled into two differentiated clusters to obtain a better understanding of their PEB backed by discriminant analysis.

This study included the application of the green market segmentation concept to the consumer market specifically in India. This paper begins by developing several alternative ways of characterising the green market segmentation concept. Next, relevant literature is presented on environmental criteria for differentiating individuals. Research methodology is described in addition to the empirical results and conclusions (Figure 1).

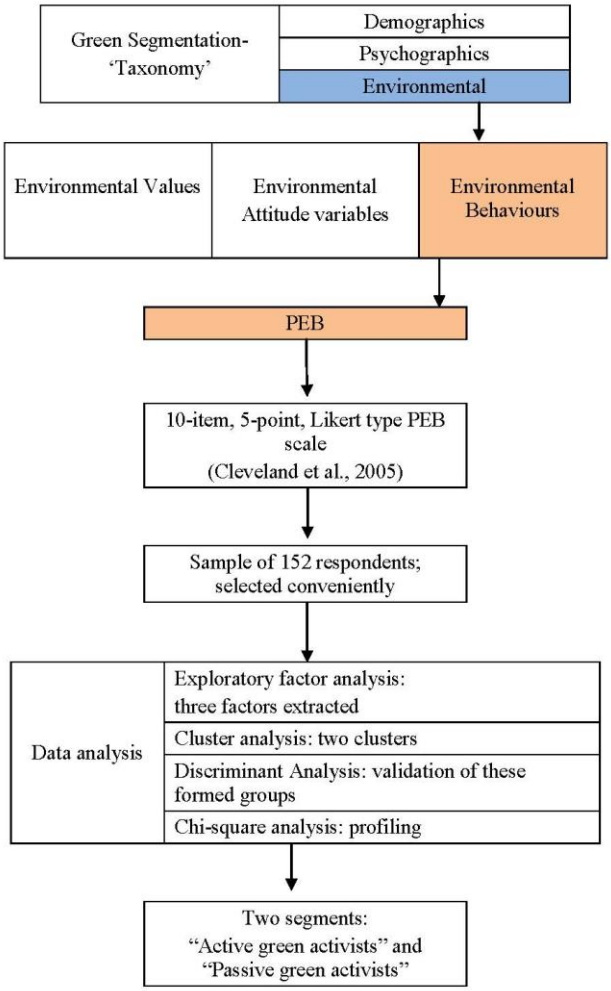

Figure 1. Summary of the study

TAXONOMY OF "GREEN SEGMENTATION"- REVIEW OF LITERATURE

Studies relating to green consumers in general and the green segmentation specifically are in the budding stage. However, some researchers experienced "difficulty in choosing the proper segmentation base or criteria [stemming] from the fact that many segments cannot be detected in the market place in its original form" (Paco & Raposo, 2009, p. 366). Admittedly, Wind (1978) identified that the segmentation practice and academic developments are incongruent with one other. In this section, segmentation criteria based on demographic, behavioural, psychographic, and environmental variables will be examined.

Since the 1970s, demographic variables research has been a great concern for researchers. Likewise, age variables were investigated in various studies wherein Anderson, Henion and Cox (1974) found a negative relationship followed by Zimmer, Stafford and Stafford (1994). However, other authors have reported no such relationship (Kinnear, Taylor, & Ahmed, 1974; Roper Organization, 1992). In his study, Roberts (1996) observed a positive correlation between age and behaviour. In addition to this area of study, a second demographic variable to be examined is income. Newell and Green (1997) have found a moderate effect, while some researchers have not found any direct relationship (Kassarjian, 1971; Anderson et al., 1974; Van Liere & Dunlop, 1981). In contrast, some researchers have reported neither a direct nor an indirect relationship (Kinnerr et al., 1974; Roper, 1990; Zimmer et al., 1994).

A review of the literature on gender as a segmentation base found mixed responses with different roles, attitudes, and skills assumed for each gender. Straughan and Roberts (1999) stated that women are more pro-environmental and more concerned about environment than men (Berkowitz & Lutterman, 1968; Banerjee & McKeage, 1994). For example, women have higher recycling participation compared to their male counterparts (Mainieri and Barnett, 1997). Regarding the participation of natural resources, the results obtained were non-significant for supporting environmental groups.

Education has been generally thought to be positively related to behaviour. A literature review evidenced that education was more highly consistent than other demographic variables and found a significantly positive relationship with environmental behaviours (McEvoy, 1972; Anderson et al., 1974; Roper Organization, 1990; Newell & Green, 1997; Diamantopaulos, Schlegelmilch, Sinkovics, & Bohlen, 2003). In fact, social class was discussed little in green research as it was found to have a high correlation to income, occupation and

education. However, social class is generally believed to influence individuals' lifestyles and new product adoption (Hooley, Saunders, & Pierry, 1998). Ultimately, many studies have used demographic variables in relation to environmental attitudes and/or behaviours, and if the results were found to be significant, then these results offered easy solutions to market segmentation.

For more efficient segmentation, several studies have explored psychographic variables. Hine and Gifford (1991) established the effect of anti-pollution movement on PEBs. Furthermore, Roberts (1996b) confirmed the relevance of the "liberalism effect" as a reflection of political orientation. Stern et al. (1993) found that egoism (which refers to the willingness to incur extra costs associated with environmentalism) and social-altruism (a concern for others' welfare) affect green behaviour. Many researchers addressed the issues that perceived consumer effectiveness centred on consumers' attitudes influenced consumers' beliefs (Antil, 1978; Webster, 1975; Roberts, 1995; 1996b).

Values were considered as the criterion variables (or drivers) as they determined the actions and conducts involved in consumer effectiveness. In this regard, many studies have attempted to link value and its relevance to environmentally friendly behaviour. In particular, Schwartz (1992, 1994) reported that ecological behaviour was changed if values grouped into "self-transcendence" and "self-enhancement" were negatively related to eco-centric attitude (Schultz and Zelezny, 1999). Similarly, a causal relationship between values and ecological behaviour was supported in the study by Thøgersen and Olander (2002, 2003). According to De Young (1985, 1986), lifestyles also influenced ecological behaviour and were found to be significant in glass and paper recycling. In fact, Lievers, Serra and Watson (1986) stated that "…people with conservative and religious values and lifestyles liked to contribute actively to the society improvement."

In recent years, the attitude variable was applied widely in relation to the buying of products in varied contexts. According to Eagly and Chaiken (1995), "an attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor". Consumers made their purchasing decisions based on their attitude towards environment (Schwepker & Cornwell, 1991). Studies performed by Balderjahn (1988), Roberts (1996), and Kalafatis, Pollard, East and Tsogas (1999) found that consumers' attitudes were excellent predictors of environmentally friendly behaviour. Surprisingly, consumers valued "clean environment", but this sentiment was inconsistent with their actual behaviour (Dembkowski & Hanmer-Lloyd, 1994). McCarty and Shrum (1994) found that actual behaviour was influenced by the perception of inconvenience, rather than the belief regarding the actual inconvenience involved in recycling.

In cross-sectioning the previous literature, environmental concern has been explored in various studies. Environmental concern may be defined as an attitude that is related to environmental consequences (Antonides & van Raaij, 1998). Until the 1980s, Lepisto (1974) and Kinnear et al. (1974) established the relationship between attitude and/or behaviours with environmental concern. Then, Antil (1984) and Roberts (1995; 1996b) correlated environmental concern with environmentally friendly behaviour. Attention has been paid to "locus of control" and alienation wherein "locus of control" was linked to environmental concern in Henion and Wilson (1976). However, Balderjahn (1988) investigated alienation in relation to PEBs. Mostafa (2009) formed segments by linking environmental concern with purchase intention using self-organising maps (SOM).

Previous studies also centred on consumers' knowledge, which is established as influencing criteria in all stages of the buying process. Vining and Ebreo (1990) and Chan (1999) tested consumers'' environmental knowledge or "ecoliteracy" as a determinant of environmentally friendly behaviour. However, ecoliteracy was proven to be a poor predictor of environmentally friendly behaviour (Laroche, Bergeron, & Barbaro-Forleo, 2001). In addition, efforts were made in relating "environmental consciousness" to environmentally friendly behaviour. In general, according to Hartmann and Ibanez (2006), "environmental consciousness" referred to the "cognitive dimension of environmental attitudes, or environmental behaviours". Environmentally conscious people were frequently changing their purchasing behaviours (Chase, 1991) in favour of those greener behaviours (Peattie, 2001).

Another variable that the literature review showed to be relevant and affecting environmental knowledge, attitude and behaviour was so-called "perceived behavioural control". This variable explained the extent to which consumers' believed in the ability to effect environmental preservation. According to De Pelsmacker, Janssens and Geuens (2002), high "perceived behavioural control" leads to more intense eco-friendly behaviour. If consumers felt that their actions would solve environmental problems, they displayed more proactive behaviour according to Straughan and Roberts (1999).

Consumers who were receptive to green products and purchase such products by choice are ready to pay premiums to help companies in recovering additional cost associated with being green. However, other authors suggested that some consumer groups favour green products and are willing to pay more for these products (Kassarjian, 1971; Klein, 1990; Laroche et al., 2001). For example, the

study performed by Reinhardt (1998) reports that consumers were ready to pay more than 5% for green products. In fact, Roper Starch Worldwide (1997) indicated that consumers would pay as high as 20% or more for environmental benefits; however, the literature on willingness to pay equivocally suggested otherwise (Wood, 1990; Sims, 1993).

PEB was particularly driven by internal factors including the psychologist view that has been attributed to the external conditions which the economists view as a factor (Clark, Kotchen, & Moore, 2003). Guagnano, Stern and Dietz (1995) argued to incorporate internal processes and external conditions into the socioeconomic theory of behaviour (p. 700). An interdisciplinary perspective was required to provide a more complete framework for analysing PEB. In the same vein, Balderjahn (1988) considered consumers' ideology a control for various PEBs. For example, internally controlled individuals conserve more energy and purchase energy savers, but externally controlled consumers participate in public acts such as joining environmental organisations and signing petitions. Taken collectively, with the exception of several recent publications (Steg & Vlek 2009; Laroche et al., 2001; Schwartz, 1990; McDaniel & Rylander, 1993), the literature on grouping consumers based on PEB has offered inadequate theoretical specification. Moreover, studies specific to the Indian context in this area are rare, and thereby the present study is a foray in this regard.

RESEARCH GAP AND RESEARCH QUESTIONS

The green marketing segmentation literature centres its focus mainly on consumers' purchasing behaviours and the practice of green marketing strategies. However, within the green consumer behaviour domain, many researchers have studied demographics and other environmental variables linked to green purchasing behaviours to characterise green consumers. However, few studies have taken the microscopic view and have not considered green purchasing behaviour for profiling. These studies are more focused on consumers' PEBs and have less interest in green purchasing behaviours. Furthermore, studies using PEBs for categorisation are rare in India. This dearth of research leads to the need for investigation of the following research question:

RQ: Do different typologies of Indian green consumers exist in terms of PEB?

RESEARCH METHODOLOGY

The Survey Measures

The measures used in this study were adapted from past studies. The survey method was employed through a structured non-disguised questionnaire which consisted of two sections: (1) respondents' general demographic information and (2) questions regarding PEB. These PEB data using a 5-point Likert-type scale were adopted from the Cleveland et al., (2005) study and were verbally anchored by a "strongly agree" (5) and "strongly disagree" scale (1). The PEB scale was measured with ten statements capturing public transit use, energy use, conservation and automobile use/maintenance behaviours. During the pilot testing process, revisions were made to the questionnaire such as edits to wording and structure errors. Participants' suggestions were also incorporated into the survey prior to its final version.

Reliability Statistics of Measures

Reliability is ensured by establishing internal consistency of the measures. Accordingly, Cronbach alpha (α) was computed, which is an indicator of internal consistency. Cronbach alpha was computed to be 0.634 with the item-to-total reliability of all ten statements of 0.4 (Nunnally, 1978) (Table 1).

Sample

The study sample composition consisted of individuals with age group 18+, which was selected to capture the diversity of respondents residing in India. It is reasonable to assume that this age group has decision making abilities and is able to select from various choices. As per Hair, Anderson, Tatham and Black (1998), considering ten observations per variable and that PEB has ten variables, the effective sample size must be 100. With the standard 95% confidence level at 8% tolerance for error, it was determined standards should be used for an unknown population. With this statistical standard, it was found that the required sample size was 150, while the actual number of respondents was 152 higher than the threshold. These 152 respondents were selected through convenience sampling.

Table 1
Reliability Statistics of dependent variable (PEB)

Variable name	Statement	Item-to-total reliability	Cronbach's Alpha
D1	I use public transport (bus / train) whenever that option is available	0.649	0.634
D2	I keep my bike/car well-tuned by taking it for regular service	0.603	
D3	I drive my bike/car more slowly and consistently	0.594	
D4	I usually turn-off the bike/car at the red signal at traffic point	0.616	
D5	I turn-off all electronic equipment when not in use	0.583	
D6	I usually buy more expensive but more energy efficient light bulbs	0.620	
D7	I prefer to walk rather than drive to a store that is just a few blocks away	0.598	
D8	I refuse to buy products from companies accused of being environmental polluters	0.589	
D9	I take my own carry bags while shopping	0.625	
D10	When buying something wrapped, I check that it is wrapped in paper or cardboards made from recycled material	0.609	

DATA ANALYSIS AND MAJOR FINDINGS

Demographic Respondent Profile

The sample demographics reflect that a majority of the respondents are male (n = 113, 74.3%), with only 25.7% respondents being female (n = 39). Large family size (4-5 members) constitutes 65.1% of sample respondents (n = 99). In addition, 90.2% of sample respondents are within the age groups 20-35 (n = 65, 42.8%) and 36-50 (n = 72, 47.4%). The sample is balanced with 50.7% single (n = 77) and 48.7% married (n = 74) respondents. However, respondents with high educational levels (postgraduates and doctorate) represent the majority with 69.7% (n = 106) of the sample, while medium education level (graduate) represents 24.3% (n = 37). The lower educational levels (undergraduate and high school) represent 5.9% (n = 9) of the sample (Table 2).

Table 2
Sample characteristics

Variable	Range	Frequency	%
Gender	Male	113	74.3
	Female	39	25.7
Family size	1 person	2	1.3
	2-3 persons	38	25.0
	4-5 persons	99	65.1
	More than 5 persons	13	8.6
Marital status	Single	77	50.7
	Married	74	48.7
Employment status	Full time	95	62.9
	Part time	13	8.6
	Student	25	16.6
	Housewife	4	2.6
	Unemployed	5	3.3
	Business	9	6.0
Home ownership	Own	112	74.7
	Rent	37	24.7
Age	Less than 20	2	1.3
	20-35	65	42.8
	36-50	72	47.4
	More than 50	13	8.6
Education	High school	3	2.0
	Undergraduate	6	3.9
	Graduate	37	24.3
	Postgraduate	85	55.9
	Doctorate	21	13.8

Results

Considering that individuals vary in regard to their PEB and that the list of variables is extensive, an exploratory factor analysis (EFA) was performed to simplify the interpretation of variables. The main goals of EFA are data reduction and summarisation of variables to a smaller set of factors (Kim & Mueller, 1994a, 1994b) preserving the essential nature of original variables to the extent possible.

Data collected on ten variables were entered into factor analysis. Principal Component Method was selected with Varimax rotation to extract factors. Accordingly, KMO Measure of Sampling Adequacy and Bartlett's test of sphericity were found to be satisfactory. Using form anti-image correlation matrix, it was found that statement 1 had a measuring sampling adequacy (MSA) value less than 0.5, and this statement was therefore deleted. Next, the remaining nine statements were subjected to factor analysis. The KMO Measure of Sampling Adequacy was 0.638, indicating that the analysis results are meritorious (Kaiser, 1970). Bartlett's test of sphericity was significant at 0.000 levels, thus demonstrating a high elevated degree of correlation between the variables (Hair et al., 1998) (Table 3).

Table 3

Factor analysis results and composition of each factor

Factors	Items	Description	F1	F2	F3	% of Variance	% of Cumm. Variance
Energy economies	Prefer to walk rather than drive	The variables related to the tendency of individual's economic motives, and display of high economic concern are grouped together in the first factor like prefer walk over vehicle, drive slowly and maintain vehicles regularly etc.	0.780			27.157	27.157
	Buy more expensive but more energy efficient light bulb		0.595				
	Drive my bike/car more slowly and consistently		0.583				
Energy conservatism	Turn-off the bike/car at red signal at traffic point	The second factor includes variables that may reflect an environmentally friendly behaviour, since they relate to the saving of energy resources and conservation. Also, it relates to reduction in energy usage when they are not in use		0.772		15.089	42.256
	Turn-off all the electronic equipment when not in use			0.755			
	Keep my bike/car well-tuned by taking it for regular service			0.592			
Energy activism	Check wrapped in papers/cardboards made from recycled material	The third factor essentially brings together the variables related to an active participation in environmental protection, refers to showing pro-activism and action orientation in taking care of environment			0.777	11.878	54.124
	Take my own carry bags while shopping				0.772		
	Refuse to buy products from company i.e. environmental polluters				0.538		

Kaiser-Mayer-Olkin Measure of Sampling Adequacy = 0.638, Bartlett's Test of Sphericity: Approx. Chi-Square (36) = 175.842; $p = 0.000$

Finally, three factors were extracted, which together explain 54.124% of the variance. The minimum factor loading observed was 0.538, and the maximum

loading was 0.780. The factors, their respective items with the numbers and their corresponding factor loading are given in Table 3.

After the determination of the most prominent factors for the study through the factor analysis, these variables were used as inputs in the subsequent analyses. The factor scores were calculated for each respondent based on an average score for each statement loading onto that factor for PEB. These scores were then subjected to hierarchical cluster analysis to identify possible clusters according to the respondent's PEB. For cluster analysis, the squared Euclidean distance and Ward's method were used (Table 4) to analyse the cluster numbers formed, the case numbers in each cluster, and the mean a nd standard deviation when each variable is crossed with each cluster.

Table 4
Cluster analysis results

	Cluster 1 *n* = 106 (69.3%)		**Cluster 2 *n* = 45 (29.8%)**	
Variables	Mean	SD	Mean	SD
Energy economics	4.066	0.694	3.896	0.697
Energy conservatism	3.774	0.705	3.629	0.637
Environmental activism	3.371	0.613	4.356	0.457

Further testing was performed to meet two objectives: (1) to observe whether significant differences in the means of clusters exist; and (2) to validate the determined groups. Accordingly, we used the One-Way variance analysis (ANOVA) and Discriminant analysis. For subsequent analysis, variables used for cluster information were treated as dependent variables and clusters obtained were treated as independent variables. The results of Wilks' lambda, *F* statistics and significant levels are displayed in Table 5.

Table 5
Wilks' lambda and F-statistics

Variables	**Wilks' lambda**	***F***	**Sig.**
Energy economics	0.987	1.888	0.171
Energy conservatism	0.991	1.394	0.240
Environmental activism	**0.614**	93.858	0.000*

In the Variables column of Table 5, only one variable, "Environmental activism", was significant to differentiate the groups at a 0.01 level. Other variables,

"Energy economics" and "Energy conservation", were found to be non-significant. The Wilks' lambda value indicates that the "Environmental activism" variable provided a larger spread between the clusters' mean (Malhotra, 1993), which had the least value.

To validate the resulting formed cluster analysis groups, a multiple discriminant analysis (MDA) was conducted. This analysis allowed us to find a discriminant function (Table 6). The percentage of explained variance by the function in the found groups was calculated as the square of canonical correlation coefficient (Malhotra, 1993). In this case, the function explained approximately 62% (square of 0.783) of the variance.

Table 6
Canonical discriminant function

Eigen value	**Canonical correlation**	**Wilks' λ**	**Chi-square**	**df**	**Sig.**
1.580	0.783	0.388	139.813	3	0.000*

The calculated Wilks' Lambda value (0.388) was converted into a chi-square value of 139.813, with 3 degrees of freedom and statistical significance to 0.000 levels. This value indicates that the function is significant to discriminate between the found groups (Mitchell, 1994). After observing statistical significance between groups, it becomes useful to examine the individual contribution of the discriminating function's variables. The standardised canonical functions coefficients indicate, in absolute values, the relative importance of each variable to differentiating between the two groups (Table 7).

Table 7
Standardised canonical discriminant function's coefficients

Variables	**Coefficients**
Energy economics	–0.737
Energy conservatism	–0.532
Environmental activism	1.415

*Significant at 0.01 level

To test the validity of the obtained discriminant function, it is required to identify whether the existing number of individuals included into the groups significantly differs from the expected number (Table 8). As observed, 92.05 per cent of individuals were correctly classified into their groups through discriminant function, which reveals satisfactory validity (Malhotra, 1993).

Table 8
Classification results

			Predicted Group	
Original group	No. of cases	%	Group 1	%
Group 1	106	69.3	**94**	88.7
Group 2	45	29.8	0	0
Total	**151**		94	

Note: *Percentage correctly classified* = (94+45)/151=0.9205= 92.05%

For the purpose of group profiling, bivariate analysis was performed (Table 9). Significance of demographics characteristics in the differentiation of the groups was established through cross tabulations and Pearson's test (χ^2 analysis). The variables "gender" and "marital status" were found to be significant for differentiating between the groups. The variables "age", "education", and "occupation" were found to be non-significant for differentiating between the groups.

Table 9
Chi square summary

Variable	**Pearson's χ^2**	**Df**	**Sig.**
Gender	6.231	1	0.008*
Age	3.506	3	0.320
Education	6.92	4	0.140
Occupation	1.848	5	0.870
Marital status	6.845	1	0.009*

*Significant at 0.01 level

For characterising groups or segments found, the crossing of demographic variables and behavioural (PEB), as well as the previously obtained results, were used to different the segments. The resulting segments are described as follows:

1. *Active Green Activists*--This segment, which composed 37.75% of the total sample, is primarily women (*n* = 25, 64.10%), with 35.89% males. The segment is dominated by unmarried individuals (*n* = 35, 62.5%), while married individuals comprise 37.5% (*n* = 21). Their values include active participation in protests in defending environmental causes and supporting environmental organisations, among other relevant activities. These

individuals' beliefs include providing extra effort to environmental resource stewardship and not purchasing a product from companies with a reputation of environmental polluting.

2. *Passive Green Activists*--This segment comprises 62.25% of the total sample, which is primarily married individuals (n = 54, 59.57%). This group consists of a higher percentage of males (n = 69, 73.4%), as only 26.59% are women (n = 25). These respondents value non-human elements of the environment and display high concern regarding PEBs such as energy conservation, water resources, forestry, and pollution (Straughan & Roberts, 1999, p. 562). They prefer to walk rather than using vehicles and carry bags while shopping, among other behaviours. They always try to control their behaviours to minimise the negative effects on environment, but never display their negative opinions of companies when they do not prioritise environmental issues.

DISCUSSION

This study examined three underlying factors that influence consumers' PEB:

1. Energy economics (economic factor),
2. Energy conservation (resource saving), and
3. Environmental activism.

Thereafter, cluster analysis was performed based on these three factors, which resulted in two clusters. To validate the clusters, discriminant analysis was run using clusters membership (as DV) and factors extracted in factor analysis (IV). It was found that 92.05% of individuals were correctly classified into their groups through one discriminant function. Furthermore, using ANOVA, significant differences were found between the mean of clusters . Pearson's test (χ^2 analysis) was used to obtain the significance of demographic characteristics in the differentiation of the groups formed, and profiling was also performed. Henceforth, two typologies were formed: 1) the "active green activists" and the "passive green activists" based on the consumers' PEB.

This paper helps to contribute a better understanding of consumers' PEB, and it presents categories for segmenting consumers by behaviour. The results of the study indicate that are two consumer segments in which "active green activists" appear to participate in environmental protection and actively undergo steps to make environmental considerations. In contrast, the "passive green activists"'

display pro-environmental actions on a personal level and choose not to participate publicly.

An essential implication for marketers is that while targeting "active green activist" consumers who display higher PEB, these consumers' behaviours must be reinforced through rewards. The individuals from this segment are well informed and committed towards what they are doing. Therefore, media campaigns should be developed that appreciate these behaviours and provide these consumers with a sense of self-satisfaction. Females are more concerned with their PEBs and should be treated as trendsetters in motivating their peer groups to behave pro-environmentally. In addition, marketers can identify opinion leaders form "active green activists" who can network and influence their peer group with ease. Awareness programs should be developed to make consumers realise the positive impact of their behaviours on the environment, such as further preventing environmental degradation.

To change voluntary behaviours of "passive green activists", companies should use informal or personal channels to reinforce their efforts and should communicate the rewards of sacrificing convenience. This consumer segment behaves environmentally friendly, but these consumers are motivated to take charge and contribute on a wider scale to protect the environment. Such consumers should be targeted through a media campaign illustrating how they can help the environment significantly. Those companies that do not have green practices may risk losing some credibility in the eyes of consumers with pro-environmentalism, who may switch to other companies if green options are available.

As with any study, the methods in the present study imposed limits on the generalisability of results, as all variables were measured by self-reporting. The results did demonstrate the suitability of the traditional K-means cluster analysis within the context of the current study. More research is required to be confident about the most appropriate segmentation method and design for other situations and contexts. As in many research studies of consumer markets, a truly representative sample was difficult to achieve, and a sampling bias may exist.

The current study contributes to the literature on green segmentation using PEB for classification. In future studies, increasing the number of relevant variables could diversify the findings and elicit insights for marketers and researchers at large. An additional source of future research is to understand various PEBs and the motivational or cognitive processes that ensure environmental sustainability.

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