Original Article

Identifying the green consumer: A segmentation study

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Arminda M. Finisterra do Paço
has obtained her PhD in Management and is an assistant professor and researcher in the Business and Economics Department of Beira Interior University, Portugal. Her research interests are green marketing, public and non-profit marketing, social marketing and entrepreneurship education.

Mário Lino Barata Raposo
has obtained his PhD in Management and is a full professor in the Business and Economics Department of Beira Interior University. He is Coordinator of the research unit NECE, coordinator of the Transfer Technology Office, vice-president for Portugal of the European Council for Small Business and vice-council of the university. His research interests are marketing and entrepreneurship.

Walter Leal Filho
has obtained his BSc, PhD, DSc and DL and heads the Research and Transfer Centre 'Applications of Life Sciences' at the Hamburg University of Applied Sciences in Hamburg, Germany. His research interests are on environmental management, corporate social responsibility, marketing and the connections between climate and behaviour.

ABSTRACT The modern world has led consumers to become increasingly concerned about the environment. Such concerns have begun to be displayed in their purchasing patterns, with consumers increasingly preferring to buy so-called 'environmentally friendly products'. Marketing managers have in turn recognised the strategic importance of marketing in finding responses to the 'environmental needs' of consumers due to the influence this may have on their consumption habits. The growing number of organisations entering the green product market also indicates the need for suitable segmentation and positioning strategies. This paper focuses on the identification of distinct market segments. Through the use of variables related to the environment, as well as demographic variables, the segments that are occupied by consumers with different sensitivities to environmental matters are identified, and the possible implications of these results for the marketing strategies of companies are also discussed.

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INTRODUCTION

Several factors have contributed to the emergence and growth of an environmental protection movement, although it seems that none of them has been more important than the perception that our planet is reaching extremely high saturation levels of pollution.[1,2] Environmental concerns and the demand by consumer groups for environmentally friendly products have, for example, led to the emergence of a 'new marketing philosophy', known as green marketing.[3,4]

Correspondence: Arminda M. Finisterra do Paço
Department of Business and Economics, Research Unit NECE, University of Beira Interior, Covilhã 6200-209, Portugal
E-mail: apaco@ubi.pt

As far as the conceptual aspects related with green marketing are concerned, Kilbourne[5] suggests that there has been an anomalous development in this specific field of study. Research tends to be fragmented and very specific, sharing common aims and focusing on the identification of the environmental consciousness of consumers, or on the development of scales for measuring the level of environmental concern. At times, it is also clear that the existing literature is written from diverging perspectives.[6–8] This fact is not necessarily negative, but does show the plurality of views.

However, there is also some consensus around the idea that market segmentation and market orientation appear as aspects to which the marketer needs to pay special attention. The growing concern with the environment, increased competition, and the greater selectiveness and demands of consumers represent some of the immediate challenges to green marketing.

This paper comprises the following major sections. The first section begins by presenting a brief description of the concept of green marketing. Next, the importance of market segmentation is highlighted together with a presentation of the most relevant criteria for differentiating individuals in terms of their environmental behaviour. After this contextualisation, the main methodological aspects related to the investigation are presented in the second section. The third section discusses the research methodology, and the fourth section presents the results. The last section discusses some practical implications and presents some conclusions.

THE CONCEPT OF GREEN MARKETING

Much of the research into environmental responsibility was in fact undertaken in the 1970s and 1980s, when few consumers made a serious assessment of the impact of products on the environment. There were few green products available during this period, and many studies on environmental responsibility focused on other issues, such as energy conservation and political activism. Studies on consumer behaviour have also appeared with greater frequency in recent years.

The 1990s have been identified as the 'decade of the environment',[9–11] or as the 'the Earth decade'.[12] During this decade, social and environmental concerns took on a greater importance for consumer purchasing decisions.[13,14] It can therefore be said that environmental concerns and the consumer demand for green products were driving forces behind the resurgence of green marketing, the aim of which is to achieve a balance between the objectives of sales and profits, on the one hand, and a concern for society and the environment, on the other.[2] At the same time, firms seeking to remain competitive and to survive in the market began to incorporate these newly emerging concerns in their management and marketing decision making.[3,14–17]

Thus, green marketing can be defined as 'the holistic management process responsible for identifying, anticipating and satisfying the needs of customers and society, in a profitable and sustainable way'.[4]

According to Polonsky,[18] green or environmental marketing consists of all activities designed to generate and facilitate any exchanges intended to satisfy human needs or wants, such that the satisfaction of these needs and wants occurs, with minimal detrimental impact on the natural environment.

There are many factors that influence green marketing. Products that are deemed negative and the use of which may lead to a set of negative effects (for example, global warming, ozone layer depletion, rainforests' destruction and so on) or consequences (for example, disruptions in agriculture, increases in the frequency of draughts/floods) are normally unsuitable. Figure 1 outlines some of the factors associated with the green marketing of products.

Recently, increasing attention has been paid to the relationships among consumer behaviour, marketing and the environment. Such attention has been manifested in two ways: on the one hand, there has been an increase in public awareness about environmental aspects, and, on

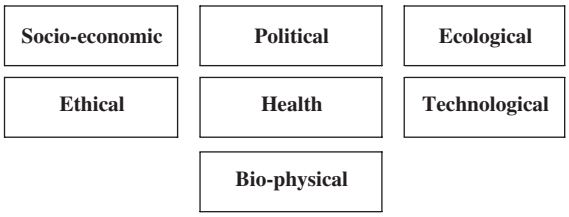

Figure 1: Some of the factors associated with the green marketing of products.

the other hand, an increase in the evidence of environmental responsibility or green marketing activities. Thus, the increase in environmental consciousness and concern seems to be a good incentive for decision-makers in the field of marketing to adopt new management practices.

SEGMENTATION OF THE GREEN CONSUMER MARKET

To set a market segmentation process in motion, one first needs to choose a set of variables that will then compose the so-called segmentation bases or criteria used to identify consumption patterns. Next, an attempt will be made to provide an overall perspective of the various segmentation bases and their respective variables, seeking to direct the approach towards the situation of the green consumer market. Specifically, the demographic, psychographic and behavioural criteria will be examined.

Demographic criteria

The variable 'age' has been explored by countless green marketing researchers (see, for example, Anderson *et al*,[19] D'Souza,[20] Jain and Kaur,[21] Roberts,[22] Samdahl and Robertson[23]). However, discussion of the pertinence of this variable for distinguishing between green consumers and other consumers has not always enjoyed general agreement. There are studies suggesting that there is no significant correlation between age and environmental attitudes/behaviour.[24] Others suggest that there is a significant and negative correlation,[19,25,26] while yet others have found a significant and positive correlation between age and environmental sensitivity and behaviour.[22,23]

The development of the roles, skills and attitudes assumed by each gender has led many researchers to argue that women are more likely to present pro-environmental behaviour. But the results obtained in relation to this variable have not always produced similar results. For example, some studies agree when they conclude that women are more aware of and concerned with the environment than men.[27–30] Mainieri and Barnett[31] state that women tend to be more pro-environmental than men, insofar as they buy more green products and participate more in the separation of packages for recycling, but they did not find any significant differences between the two genders in terms of their participation in activities for the conservation of natural resources or participation in environmentalist groups.

Individuals with greater training and higher educational levels, and consequently enjoying access to more information, are expected to display greater concern, acting more frequently in favour of the environment. For example, Granzin and Olsen[32] found that there was a positive relationship between the variable 'education' and the variable 'walking for environmental reasons' (instead of using a car). However, this variable's explanatory capacity is not confirmed by other studies.[31]

Although the results of studies examining the relationship between the variable 'education' and environmental aspects are more consistent than those of other demographic variables, no definitive and conclusive relationship has yet been established between the two variables.[15] Most of these studies found a positive relationship between the variable 'educational level' and environmental attitudes.[19,22,25,26] However, Samdahl and Robertson[23] noted that level of education is negatively correlated with environmental attitudes, and Kinnear *et al*[24] did not find a significant correlation between these two variables.

It is generally believed that income is positively correlated with environmental sensitivity. The most common justification for this situation is based on the fact that individuals with a higher income level can more easily bear the marginal increase in the costs associated with supporting 'green causes' and buying green products.[15]

The results of the studies by Berkowitz and Lutterman[27] and Henion[33] suggest that consumers

with middle and high incomes and a higher educational level are more predisposed to display a pro-environmental behaviour. However, environmentally friendly behaviour was not shown to be consistent throughout the various income brackets. Samdahl and Robertson[23] concluded in their study that environmentally aware consumers had a lower educational level and lower income than the average for Americans as a whole. This led them to conclude that income and educational level were not very reliable variables for predicting environmental concern or buying behaviour.

Psychographic criteria

It was in the 1960s that the concept of lifestyle first began to be used more frequently by marketing managers in research undertaken into the phenomena of buying and consumption. This concept is based on the study of people's activities, interests and opinions.[34] As far as the question of activities is concerned, it is likely that those individuals who are more closely involved in community and/or socially responsible activities may display a more pro-environmental behaviour.[35] In relation to the matter of interests and opinions about political questions, there exists a perception that, in general, environmental themes are part of a 'liberal' political agenda. Some studies suggest that individuals with a liberal political background are more likely to display a strong commitment to the green movement, in contrast to those with more conservative political views.[15,36]

Since the 1970s, variables relating to personality have been used in segmentation studies, but, according to Cornwell and Schwepker,[35] two of these variables have been given more attention than the others: locus of control (which describes the extent to which the individual perceives that a reward or improvement depends on his behaviour), and alienation (the individual's feeling of being isolated from his community, society or culture). The first variable was examined in some studies relating to environmental concern. In turn, the variable 'alienation' has been used in several studies of pro-environmental behaviour.[37]

The variables of personality have shown a high level of correlation with environmental consciousness.[24,38] However, although this relationship was noted in many studies, the fact remains that the results have been inconsistent in regard to specific pro-environmental behaviour, such as green product buying decisions.

The variable values may also be included in the psychographic segmentation basis. The studies undertaken by Homer and Kahle[39] and McCarty and Shrum[40] helped to clarify the interrelationship between values, attitudes and environmental behaviour. The research undertaken by Homer and Kahle[39] provided the empirical support for the hierarchical effect of the 'value-attitude-behaviour' model in the case of ecological food. Individuals buying products of this type gave greater importance to the values of internal orientation (self-realisation, happiness and fun, a sense of completeness and self-respect) whereas those not buying them seemed to be more geared towards external values (sense of belonging, being respected and safety).

Follows and Jobber[41] suggest that individuals who give greater importance to conservative values either do not wish to complicate their lives due to changes, or do not wish to be involved in something that is not the norm. In this way, it is thought that such individuals attach little importance to the direct impact that products have on the environment and great importance to the direct impact of the products themselves.

Behavioural criteria

In behavioural segmentation, buyers are divided into groups based on their knowledge, attitude, use of a product or response to a product, with an attempt also being made to understand their buying behaviour from the viewpoint of users and non-users.

Chan[42] sought to segment the market, based on the usage rate of green products, and to understand how the segments differed in terms of their demographic profile, perception and attitude towards the purchase of green products. Consumers showing a high utilisation rate of these products (*Heavy Green Consumers*) were found to be more influenced by the opinions of other people, the

government and environmentalist groups, had a strong sense of identity and were concerned about the environment. In turn, those who consumed far less (*Light Green Consumers*) displayed a low usage rate, and thought that ecological products were harder to find.

In the case of the variable 'attitude', the attitudes of green consumers must, by definition, express environmental concern.[24] Research has shown that environmental concern is related, but not highly correlated, with consumer behaviour.[35] Balderjahn[37] concluded that individuals who had a positive attitude towards the environment participated more in the buying and consumption of green products.

Consumers do not always base their buying decisions on their attitudes towards the environment, even though these attitudes can have a fairly strong influence on their purchases.[36] Several studies have investigated the relationship between attitudes towards the environment and the buying of products[38,43] or the intentions of use.[44] It seems that the more closely involved consumers are with the environment, the more likely they are to buy green products.[45]

RESEARCH METHODOLOGY

What the previous bibliographical study of the segmentation of the green market has highlighted is the fact that the various types of consumers may have different concerns and emotional attachments towards the environment, different environmental knowledge and different environmentally friendly behaviours.

As mentioned earlier, this paper seeks to identify different segments of consumers. Given the complexity and the range of variables that may determine the characterisation of these groups, as made evident in the literature review, it was decided to focus this research mainly on analysing the environmental and demographic criteria.

The data used in this study were collected through a survey of Portuguese consumers. The model of data collection was a survey conducted by means of a self-administered questionnaire. A group of 55 interviewers (university students) was used to distribute the questionnaries in their cities of origin. The main objective was to extensively cover the national territory in Portugal. The objectives of the study, as well as some technical and ethical issues, were explained to the group of interviewers before the collection of data commenced. Thus, a convenience sample was used and the final sample was composed of 887 individuals aged over 18.

The questionnaire was composed of two main sections. In the first section, data were collected about the demographic characteristics of respondents (gender, age, income, educational level and job/occupation). The second section examined the environmental dimension (concern, affect, knowledge, environmentally friendly behaviours, information search, activism, green product buying behaviour, sensitivity to price, recycling, perceived efficiency and scepticism). The scales used to measure this dimension were Likert scales (min 1; max 5).

After collection, the data were statistically analysed and interpreted using the statistical software SPSS 15.0 (Statistical Package for Social Sciences). The data obtained were submitted to a Multivariate Statistical Analysis, which included the following sequence of statistical treatment: factor analysis, cluster analysis and discriminant analysis. After this, a characterisation was made of the segments found.

RESULTS

As the number of variables used in this research is quite extensive, an exploratory factor analysis was used to simplify the interpretation of the variables. Each of the factors was depicted by means of several items used in the questionnaire.

The factor analysis used to determine the factors that were relevant to the study originated nine new variables. These were then used as inputs in later analyses (cluster and discriminant). After analysing the percentage variation of the agglomeration coefficient, it was decided to opt for a three-cluster solution (Table 1). The cluster method used was Ward's method, and the interval measure was the Squared Euclidian distance.

The variables showing the highest positive or negative scores in absolute terms help to explain

Table 1: Cluster analysis results

Variables	*Cluster 1 n=319 (36.0%)*		*Cluster 2 n=311 (35.1%)*		*Cluster 3 n=257 (29.0%)*	
	Mean	*Standard deviation*	*Mean*	*Standard deviation*	*Mean*	*Standard deviation*
Environmentally friendly buying behaviour	−0.3432	1.1392	0.4424	0.7501	−0.1094	0.8781
Environmental activism	−0.3455	0.8244	0.1938	1.0843	0.1943	0.9802
Environmental knowledge	0.3075	0.8940	0.2168	0.7613	−0.6441	1.0839
Environmental concern	0.0317	1.0134	0.1512	0.8345	−0.2224	1.1239
Recycling	−0.3128	1.1556	0.3094	0.7576	0.0139	0.9320
Perceived consumer effectiveness	−0.0166	0.9422	0.4651	0.7838	−0.5423	1.0276
Resource saving	−0.2660	1.0856	0.2740	0.7895	−0.0014	1.0309
Economic factor	−0.1732	1.0146	0.2865	0.9656	−0.1317	0.9480
Scepticism towards environmental claims	0.0085	1.0168	−0.0643	1.0640	0.0673	0.8923

Table 2: Tests of equality of group means

Variables	*Wilks' lambda*	*F*	*Sig.*
Environmentally friendly buying behaviour	0.885	57.197	0.000
Environmental activism	0.933	31.797	0.000
Environmental knowledge	0.829	91.095	0.000
Environmental concern	0.977	10.282	0.000
Recycling	0.931	32.708	0.000
Perceived consumer effectiveness	0.839	85.017	0.000
Resource saving	0.948	24.161	0.000
Economic factor	0.955	20.651	0.000
Scepticism towards environmental claims	0.997	1.238	0.290

the inclusion of consumers in the different groups or clusters.

After the 'optimum' number of clusters had been found, several tests were carried out in order to discover whether there were any significant differences among the groups. For this reason, it was decided to use one-way variance analysis and discriminant analysis.

By observing the results in column F of Table 2, it can be seen that these allowed us to reject the null hypothesis of equal means among the groups, and to accept the alternative hypothesis, as the groups displayed different means. Excluded from this situation was the variable 'Scepticism towards environmental claims'. All the other variables, when considered individually, are significant for differentiating between the groups.

The Wilks' lambda test statistic is designed to determine the discriminant function that maximises the quotient between the variation explained by the difference between the group means and the variation within these groups. The result obtained suggests that the variable 'Environmental knowledge' provides the greatest difference between the means of the clusters, as it presents the lowest score.[46] After this, and in descending order of their discriminatory power, come the variables 'Perceived consumer effectiveness', 'Environmentally friendly buying behaviour', 'Recycling', 'Environmental activism', 'Resource saving', 'Economic factor', 'Environmental concern' and 'Scepticism towards environmental claims'.

The discriminant analysis that was undertaken made it possible to find two discriminant functions (Table 3). The differences between the clusters may be analysed on the basis of the loadings of these functions.

The statistical significance of the functions is represented by the value of the Wilks' lambda test statistic, which, when transformed into a Chi-square, has a significance level of 0.000. This shows that the functions are significant for discriminating between the groups found.[47]

In view of the statistical significance observed among the groups, it is useful to examine the individual contribution of the variables to the discriminant functions. The relative contribution of each of the variables to the discriminant function can be analysed through the structure matrix (Table 4).

We are now in a position to be able to characterise the various groups or segments of

Table 3: Canonical discriminant functions

Functions	*Eigenvalue*	*Wilks' lambda*	*Chi-square*	*DF*	*Sig.*
1	0.742	0.414	776.053	18	0.000
2	0.387	0.721	287.793	8	0.000

Table 4: Structure matrix

Variables	*Function 1*	*Function 2*
Perceived consumer effectiveness	0.479[a]	−0.214
Environmentally friendly buying behaviour	0.369[a]	0.270
Economic factor	0.241[a]	0.097
Environmental concern	0.152[a]	−0.125
Scepticism towards environmental claims	−0.059[a]	0.022
Environmental knowledge	0.298	−0.602[a]
Environmental activism	0.115	0.401[a]
Recycling	0.236	0.291[a]
Resource saving	0.209	0.239[a]

[a]Largest absolute correlation between each variable and any discriminant function.

consumers found, bearing in mind the results obtained previously, through the various statistical procedures. It was thus decided that the three segments should be named, as follows:

Segment 1 – '*The uncommitted*' *(36 per cent)*
This segment mainly consists of young people (aged between 18 and 34), and is the segment that includes younger individuals with high educational levels (secondary and higher education), service, sales and administrative workers, and students, with monthly incomes ranging from €500 to €1000 and living in urban environments. The individuals in this segment have very negative positions in relation to some environmental aspects (activism, environmentally friendly buying behaviour, recycling, resource saving and willingness to pay more to preserve the environment), despite the fact that they claim to have knowledge about the issue.

Segment 2 – '*The green activists*' *(35 per cent)*
This segment is composed of individuals whose ages range between 25 and 34 years and 45 and 54 years. Compared to the other segments, this is the one that groups together those individuals with the highest education levels (higher education), working in more qualified jobs (middle and senior management and specialists from the intellectual, scientific and artistic occupations) and earning higher incomes. The individuals in this segment have a favourable position in relation to all environmental aspects, particularly towards perceived efficiency, environmentally friendly buying behaviour, recycling, sensitivity to the economic factor and resource saving, but they show themselves to be sceptical about the promotional and advertising claims made by firms.

Segment 3 – '*The undefined*' *(29 per cent)*
This segment includes individuals from the higher age groups, and those with lower educational levels than the other segments. These individuals are service, sales and administrative workers, middle and senior managers, and unskilled and domestic workers, with monthly incomes of up to €1000. They have very negative positions towards environmental issues, although they are activists, which is curious. They have a positive attitude towards recycling, and are highly sceptical about the promotional and advertising claims made by firms. They claim to have little knowledge about environmental issues. The environment does not occupy a prominent position among their concerns, and they consider that their individual action does not contribute to the improvement of the environment.

CONCLUSIONS

The results of this study show that consumers who buy green products do so for specific reasons, and that certain environmental and demographic variables are significant for differentiating between the 'greener' segment and the other segments. Yet, generally speaking, one is left with the impression that the Portuguese sample, despite their support for policies designed to improve the environment, do not translate their concerns into actions: they rarely join

environmentalist associations and they do not take part in policy-making. Their participation is often based on protecting the environment by saving electricity and water, which shows that these concerns may be more closely related with economic factors than with an environmental consciousness.

It can be concluded that the Portuguese consumers sampled here understand the challenges currently placed before the environment, and that they are aware of the existence of environmental problems, even though their concerns are not always translated into environmentally friendly behaviour. It was also noted that there are consumers who are prepared to base their buying decisions on purchasing products that do not harm the environment. In fact, it was seen that there is a segment of 'greener' consumers in the sample that differs significantly in some aspects from the other market segments.

These segments should be analysed by firms in order to assess their attractiveness, adopt a correct positioning towards them and define suitable marketing programmes. The identification of the three market segments may make it possible to implement a complex segmentation strategy, as this provides a differentiated range of consumer perceptions and choices in relation to the target market.

It is therefore to be concluded that those firms that do not respond to the 'green challenge' with products that are safer for the environment will risk losing some credibility in the eyes of those consumers who are more concerned with environmental issues. In turn, those firms that use green marketing strategies will be able to take advantage of the countless opportunities presented by environmental consumerism.

REFERENCES

1 Iyer, E. and Banerjee, B. (1993) Anatomy of green advertising. *Advances in Consumer Research* 20: 494–501.

2 Kärnä, J., Hansen, E., Juslin, H. and Seppälä, J. (2002) Green marketing of softwood lumber in western North America and Nordic Europe. *Forest Products Journal* 52(5): 34–40.

3 McDonagh, P. and Clark, A. (1995) Corporate communications about sustainability: Turning clever companies into enlightened companies. *Greener Management International* 11: 49–62.

4 Peattie, K. and Charter, M. (1997) Green Marketing. In: P. McDonagh and A. Prothero (eds.) *Green Management*. New York: The Dryden Press, pp. 388–412.

5 Kilbourne, W. (1995) Green advertising: Salvation or oxymoron? *Journal of Advertisement* 24(2): 7–19.

6 Davis, J. (1992) Ethics and environmental marketing. *Journal of Business Ethics* 11(2): 81–87.

7 Davis, J. (1993) Strategies for environmental advertising. *Journal of Consumer Marketing* 10(2): 19–36.

8 Carlson, L., Grove, S. and Kangun, N. (1993) A content analysis of environmental advertising claims: A matrix method approach. *Journal of Advertising* 22(3): 27–39.

9 Brown, J. and Wahlers, R. (1998) The environmentally concerned consumer: An exploratory study. *Journal of Marketing Theory and Practice* 6(2): 39–47.

10 Carlson, L., Grove, S., Kangun, N. and Polonsky, M. (1996) An international comparison of environmental advertising: Substantive versus associative claims. *Journal of Macromarketing* 16(2): 57–68.

11 McDougall, G. (1993) The green movement in Canada: Implications for marketing strategy. *Journal of International Consumer Marketing* 5(3): 69–87.

12 McDaniel, S. and Rylander, D. (1993) Strategic green marketing. *Journal of Consumer Marketing* 10(3): 4–10.

13 Prothero, A. (1996) Environmental decision making: Research issues in the cosmetics and toiletries industry. *Marketing Intelligence & Planning* 14(2): 19–25.

14 Menon, A., Menon, A., Chowdhury, J. and Jankovich, J. (1999) Evolving paradigm for environmental sensitivity in marketing programs: A synthesis of theory and practice. *Journal of Marketing Theory and Practice* 7(2): 1–15.

15 Straughan, R. and Roberts, J. (1999) Environmental segmentation alternatives: A look at green consumer behaviour in the new millennium. *Journal of Consumer Marketing* 16(6): 558–575.

16 D'Souza, C., Taghian, M., Lamb, P. and Peretiatkos, R. (2007) Green decisions: Demographics and consumer understanding of environmental labels. *International Journal of Consumer Studies* 31(4): 371.

17 Rivera-Camino, J. (2007) Re-evaluating green marketing strategy: A stakeholder perspective. *European Journal of Marketing* 41(11/12): 1328.

18 Polonsky, M. J. (1994) An introduction to green marketing. *Electronic Green Journal* 1(2), http://egj.lib.uidaho.edu/index.php/egj/article/view/2566/2524, accessed 16 January 2009.

19 Anderson, Jr. W.T, Henion, II, K.E. and Cox, E.P. (1974) Socially vs. ecologically concerned Consumers. In: R.C. Curhan (ed.). *American Marketing Association Combined Conference Proceedings*; 36: 304–311.

20 D'Souza, C., Taghian, M., Lamb, P. and Peretiatkos, R. (2006) Green products and corporate strategy: An empirical investigation. *Society and Business Review* 1(2): 144–157.

21 Jain, S. and Kaur, G. (2006) Role of socio-demographics in segmenting and profiling green consumers: An exploratory study of consumers in India. *Journal of International Consumer Marketing* 18(3): 107–117.

22 Roberts, J. (1996) Green consumers in the 1990s: Profile and implications for advertising. *Journal of Business Research* 36(3): 217–232.

23 Samdahl, D. and Robertson, R. (1989) Social determinants of environmental concern: Specification and test of the model. *Environment and Behavior* 21(1): 57–81.

24 Kinnear, T., Taylor, J. and Ahmed, S. (1974) Ecologically concerned consumers: Who are they? *Journal of Marketing* 38(2): 20–24.

25 Van Liere, K. and Dunlap, R. (1981) Environmental concern: Does it make a difference how it's measured? *Environment and Behaviour* 13: 651–676.
26 Zimmer, M., Stafford, T. and Stafford, M. (1994) Green issues: Dimensions of environmental concern. *Journal of Business Research* 30(1): 63–74.
27 Berkowitz, L. and Lutterman, K. (1968) The traditional socially responsible personality. *Public Opinion Quarterly* 32: 169–185.
28 Banarjee, S. and McKeage, K. (1994) How Green is My Value: Exploring the Relationship between Environmentalism and Materialism. In: C. Allen and D. John (eds.) *Advances in Consumer Research*, Vol. 21. Provo, UT: Association for Consumer Research, pp. 147–152.
29 Laroche, M., Bergeron, J. and Barbaro-Forleo, G. (2001) Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing* 18(6): 503–520.
30 Webster, F. (1975) Determining the characteristics of the socially conscious consumer. *Journal of Consumer Research* 2(12): 188–196.
31 Mainieri, T., Barnett, E., Valdero, T.R., Unipan, J.B. and Oskamp, S. (1997) Green buying: The influence of environmental concern on consumer behaviour. *Journal of Social Psychology* 137(2): 189–204.
32 Granzin, K. and Olsen, J. (1991) Characterizing participants in activities protecting the environment: A focus on donating, recycling and conservation behaviours. *Journal of Public Policy & Marketing* 10(2): 1–27.
33 Henion, K. (1972) The effect of ecologically relevant information on detergent sales. *Journal of Marketing Research* 9(2): 10–14.
34 Plummer, J. (1974) The concept and application of life style segmentation. *Journal of Marketing* 38: 33–37.
35 Cornwell, T. and Schwepker, C. (1995) Ecologically Concerned Consumers and their Product Purchases. In: M. Polonsky and A. Mintu-Wimsatt (eds.) *Environmental Marketing: Strategies, Practice, Theory and Research*. New York: The Haworth Press, pp. 119–153.
36 Vlosky, R., Ozanne, L. and Fontenot, R. (1999) A conceptual model of US consumer willingness-to-pay for environmental certified wood products. *Journal of Consumer Marketing* 16(2): 122–140.
37 Balderjahn, I. (1988) Personality variables and environmental attitudes as predictors of ecologically responsible consumption patterns. *Journal of Business Research* 17: 51–56.
38 Schwepker, C. and Cornwell, T. (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.
39 Homer, P. and Kahle, L. (1988) A structural equation test of the value–attitude–behaviour hierarchy. *Journal of Personality and Social Psychology* 54(4): 638–646.
40 McCarty, J. and Shrum, L. (1994) The recycling of solid wastes: Personal values, value orientations and attitudes about recycling as antecedents of recycling behavior. *Journal of Business Research* 30(1): 53–62.
41 Follows, S. and Jobber, D. (2000) Environmentally responsible purchase behaviour: A test of a consumer model. *European Journal of Marketing* 34(5/6): 723–746.
42 Chan, K. (1999) Market segmentation of green consumers in Hong Kong. *Journal of International Consumer Marketing* 12(2): 7–23.
43 Rios, F., Martínez, T., Moreno, F. and Soriano, P. (2006) Improving attitudes toward brands with environmental associations: An experimental approach. *The Journal of Consumer Marketing* 23(1): 26–34.
44 Alwitt, L. and Berger, I. (1993) Understanding the Link between Environmental Attitudes and Consumer Product Usage: Measuring the Moderating Role of Attitude Strength. In: L. McAlister and M. Rothschild (eds.) *Advances in Consumer Research*, Vol. 20. Provo, UT: Association for Consumer Research, pp. 189–194.
45 Schuhwerk, M. and Lefkokk-Hagius, R. (1995) Green or non-green? Does type of appeal matter when advertising a green product? *Journal of Advertising* 24: 45–55.
46 Malhotra, N. (2002) *Basic Marketing Research: Applications to Contemporary Issues*. Englewood Cliffs, NJ: Prentice-Hall.
47 Mitchell, V. -W. (1994) How to identify psychographic segments: Part II. *Marketing Intelligence & Planning* 12(7): 11–17.