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Ecologically Conscious Consumer Behavior in the Greek Market

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Abstract

Ecologically Conscious Consumer Behavior (ECCB) - including pro-environmental purchase, pro-environmental post-purchase (recycling) and pro-environmental activities – was investigated. Demographic variables, the List of Values, environmental knowledge, pro-environmental attitudes and recycling attitudes were also examined as potential correlates of the ECCB types. Evidence was found that demographics and attitudes affect ECCB, while environmental knowledge and the L.O.V. do not. Cluster analysis revealed three segments in the market, namely the Ecologically Conscious Consumers (31.66%), the Ecologically Concerned Consumers (45.26%) and the Ecologically Indifferent Consumers (23.07%). The Ecologically Conscious Consumers are those who obtained higher scores in all the types of ECCB. Therefore, it was concluded that consumers who engage in one type of ECCB are more likely to engage into another type as well. They are people who express strong positive pro-environmental and recycling attitudes; most of graduates and most of those who earn relatively higher incomes fall into the ECCs' cluster.

Keywords: Ecological Marketing, Consumer Behavior, Segmentation, Greece.

Ecologically Conscious Consumer Behavior in the Greek Market

As public concern about the environmental problems is constantly rising (Pickett, Kangum and Grove, 1993; Shrum, Lowrey and McCarty, 1995; Schlegelmilch, Bohlen and Diamantopoulos, 1996) research is needed with respect to the content of the ecologically conscious consumer behavior (ECCB) (Roberts, 1996; Tilikidou, 2001, p 5). The topic of ECCB has never been in the mainstream of the marketing academic community (Roberts, 1996). Geographically, research publications are more profuse in the U.S.A. than in Europe (Schlegelmilch et al., 1996). In Greece ecologically oriented research has been almost absolutely neglected (Tilikidou and Zotos, 1999).

Literature review indicates that in most cases only fragments of ECCB were examined (Shrum, Lowrey and McCarty, 1994; Tilikidou and Zotos, 1999). Suggestions concerning a more integrated examination of ECCB have been previously made (Schlegelmilch et al., 1996, Roberts, 1996). In Greece, Tilikidou, Adamson and Sarmaniotis (2002) made an effort to present a holistic theoretical framework. According to that framework ECCB consists of three types, namely the pro-environmental purchasing behavior, the pro-environmental post-purchasing (recycling) behavior and a set of other pro-environmental activities. The framework suggested that all the ECCB types should be examined together at the same place and time and that the examination should also include a set of factors that possibly affect each or all the ECCB types. Among those, demographics, personality variables, environmental knowledge and attitudes were selected. In this sense ECCB is not fragmentary or circumstantial but hopefully conscious, preceded by a cognitive and an attitudinal sequence.

Previous relevant studies have not revealed common demographic or personality characteristics able to describe consumers who enhance all types of ecological behaviors (Balderjhan, 1988; Pickett et al.,

1993; Roberts, 1996). However, businesses interested in adopting an ecologically oriented strategy as well as national and European authorities, responsible for environmental policies, need trustful information as to whether any ecologically conscious consumers (ECCs) exist in the market. If yes, who are they and what their characteristics are.

This paper presents the examination of all the ECCB types and their relationships with demographic and personality variables, environmental knowledge and specific attitudes, namely pro-environmental attitudes and recycling attitudes. An effort was also made to investigate the inter-relationships among the types of ECCB and to present an ecologically related segmentation of the Greek consumer market.

Review of the literature

During the nineties, ecological marketing, reflecting the mounting of public concerns began to expand. The review of the literature indicates two points: First, usually fragments of ECCB are examined under various terminology (Granzin and Olsen, 1991; Baldassare and Katz, 1992; Scott and Willits, 1994; Martin and Simintiras, 1995; Shrum et al., 1995). For example the issue of solid waste recycling is not usually examined in the same study with the ecological buying, while no attention has been paid at the investigation of the so called other, various, purchasing or non-purchasing, pro-environmental activities (Tilikidou, 2001, p. 65). Second, reviewing previous studies, in terms of their conclusive remarks, provides a mosaic of somehow unclear and sometimes contradictory pictures. Place, time and methodology (sampling and variables measurement) are usually considered to be significant reasons of the observed discrepancies in the results (Antil, 1984; Shrum et al., 1994; Schlegelmilch et al., 1996; Tilikidou, 2001, p 56).

An overall look at the previous research findings indicates that: a) demographics can provide useful information but there is no worldwide accepted demographic profile of ECCs (Shrum et al., 1994; Tilikidou and Zotos, 1999) b) the psychographic profile of ECCs is still vague (Ebreo and Vining,

2001; McCarty and Shrum, 2001) c) there is a certain link, usually moderate (Hines, Hungerford and Tomera 1987) between specific attitudes and a specific ecological behavior (Martin and Simintiras, 1995) and d) environmental knowledge has been examined in a few studies (Arbuthnot, 1977; Antil 1984; Schlegelmilch et al., 1996).

Research Objectives

In light of the literature review and of the above-mentioned theoretical framework, the following research objectives were set:

➢ To examine to what extent Greek consumers adopt the types of ECCB and the impact of demographic and personality variables (the L.O.V.) upon them

➢ To examine the impact of environmental knowledge upon ECCB

➢ To examine the relationships between each ECCB type and specifically oriented pro-environmental and recycling attitudes

➢ To investigate and describe the number and the size of the ecologically related consumers' segments in the Greek market; to provide a detailed profile of ECCs

Methodology

A survey was conducted among the households of the Thessaloniki, Greece urban area. A structured questionnaire was administered to 559 respondents, which were selected by a combination of the two-stage area sampling and the systematic sampling. Respondents were approached through personal interviews with a structured questionnaire. ECCB was measured with three multi-item behavioral variables: Pro-environmental Purchasing Behavior (11 items, Cronbach's alpha=0.8870), Pro-environmental Post-purchasing (Recycling) Behavior (5 items, one for each material) and Pro-environmental Activities (11 items, a=0.7954). Pro-environmental Activities was divided into two

sub-measures, namely Participative Activities (7 items, a=0.8288) and Individual Activities (4 items, a=0.7037). All behavioral variables were measured on a 7-point frequency scale from 1=Never to 7=Always. Selected demographics (age, education, income, occupation and gender) as well as Kahle's (1983) List of Values (L.O.V.) were included in the questionnaire. Environmental Knowledge was measured with 29 out of 30 items of the Children's Environmental Knowledge Scale (CHEKS) adopted from Leeming, Dwyer and Bracken (1995). With regard to attitudes two types of multi-item attitudinal variables were used: Pro-environmental Attitudes and Recycling Attitudes, each of 15 items (alpha values 0.7790 and 0.8834 respectively). Both the attitudinal variables were measured on a 7-point Likert scale from 1=Absolutely Disagree to 7=Absolutely Agree. It is noted that the behavioral and the attitudinal variables were originally developed for the purpose of this study and provided extensive evidence of reliability, validity and stability (see Tilikidou et al., 2002).

Results

Univariate analysis, comparative to the relevant population characteristics resulted in no statistically significant differences for all demographic characteristics, with the exception of gender. Women are slightly over-represented in the sample. Descriptive statistics for each one of the demographics are not presented due to the length of the paper.

Pro-environmental Purchasing Behavior (PPB) takes theoretical values from 11 to 77, resulted in a Mean of 43.7022, indicating average involvement of consumers in this behavior. Pro-environmental Post-purchasing (Recycling) Behavior (RB) takes theoretical values from 5 to 35, resulted in a Mean of 17.7360 while Pro-environmental Activities takes theoretical values from 11 to 77 and resulted in a Mean of 39.5470. These two variables indicated somewhat below average involvement. With regard to the two sub-measures of Pro-environmental Activities it is noted that respondents seem to be far

more involved in Individual Activities (IA) which resulted in a Mean of 20.8903, than in Participative Activities (PA), which resulted in a Mean of 18.6587.

Environmental Knowledge takes values from 0 to 29, resulted in a Mean of 17.3766 indicating a moderate level of environmental knowledge among respondents. Pro-environmental Attitudes (PAT) and Recycling Attitudes (RAT) take values from 15 to 105 each, resulted in a Mean of 81.2568 and 90.2810 respectively, indicating high scores of pro-environmental and especially of recycling attitudes within the Greek population.

Analysis of the results

ANOVA One-Way (Table 1) indicated statistically significant ($p < 0.05$) differences in PPB across education and income, in RB across education, income and occupation, in PA across education, income and occupation and last, in IA across age, education and occupation. The Means of all the behavioral variables are increasing across the categories of education, income and age. With regard to occupation ANOVAs demonstrated that employees seem to be more engaged in Recycling Behavior and Individual Activities, professionals are more engaged in Participative Activities.

Take in Table 1

Pearson's parametric correlation indicated significant, but very low or non-significant relationships between the behavioral measures (PPB, RB, PA, IA) and the L.O.V. categories. Environmental Knowledge was found to be positively correlated ($p < 0.01$) to Pro-environmental Attitudes ($r = 0.366$) and Recycling Attitudes ($r = 0.317$) but not to any of the behavioral measures. Statistically significant ($p < 0.01$), positive, moderate in most cases, relationships between each one of the behavioral measures and each one of the attitudinal measures were indicated. PPB is correlated to PAT ($r = 0.407$) and to RAT ($r = 0.375$). RB is correlated to RAT ($r = 0.413$) and to PAT ($r = 0.329$). PA is correlated to PAT ($r = 0.346$) and to RAT ($r = 0.358$), while IA is correlated to PAT ($r = 0.356$) and to RAT ($r = 0.304$).

Multiple regression (stepwise method) was then employed in order to examine the ability of the combination of age, education income, the L.O.V., Environmental Knowledge, Pro-environmental Attitudes and Recycling Attitudes to predict each one of the Pro-environmental Purchasing Behavior, Pro-environmental Post-purchasing (Recycling) Behavior, Participative Activities and Individual Activities. Gender and occupation were excluded from the analysis as they are measured on nominal scales.

The results indicated that 21.7% of the variance of the respondents' Pro-environmental Purchasing Behavior is explained by their Pro-environmental Attitudes, while 11.4% of the variance of the respondents' Recycling Behavior is explained by their Recycling Attitudes. With regard to the other Pro-environmental Activities, only 6.1% of the variance of the respondents' Participative Activities is explained by their Recycling Attitudes, while the respondents' Pro-environmental Attitudes and education level explain 31.5% of the variance of their Individual Activities. The relevant resulting equations are:

Pro-environmental Purchasing Behavior= -4.926 + 0.613 Pro-environmental Attitudes

Recycling Behavior = -0.885 + 0.237 Recycling Attitudes

Participative Activities = 5.791 + 0.178 Recycling Attitudes

Individual Activities = -4.749 + 0.227 Pro-environmental Attitudes + 1.748 Education

Clustering ECCB

Cluster analyses were then employed in order to reveal possible inter-dependence relationships between a whole set of variables. Cluster analysis makes no distinction between dependent and independent variables. The primary objective of cluster analysis is to classify variables or observations into relatively homogeneous groups (Malhotra, 1999, p. 610; Sudman and Blair, 1998, p. 558).

Hierarchical cluster analysis (Euclidean Distance and Ward Minimum Variance) was firstly utilized to group variables (Ward, 1963). Hierarchical clustering was used to explore the subtle associations among groups of the behavioral and the attitudinal items, which were all entered in the analysis. Environmental knowledge and the L.O.V. were excluded as they were found to be unrelated to ECCB in bivariate and multivariate analyses. The results are presented in a dendrogram (Figure 1) in which vertical lines represent clusters that are joined together. A three clusters solution seemed most interpretable. The position of the line on the scale indicates the distances at which clusters are joined (Malhotra, 1999, p. 619). The demonstrated associations seem considerably close, as the distances are less than 10. For the content of items a look at Table 2 is necessary.

In the first cluster the less adopted items of recycling (R03, R04, R05) are joined together with those items of participative activities (D03, D04, D05, D02 and D01) that express more active, energetic support to the environmental protection. People who take the trouble to sort out and transport more rubbish (aluminum, glass and plastic) than just return refillable bottles and recycle paper, are those who contribute to the environmental protection by purchasing ecological periodicals, by contributing money or voluntary work to ecological groups or by taking part into ecological events.

The second cluster gathered together the most important items (A07, A06, A03, A05, A01, A02, A04, A11, A10, D09, D10, A09, D06, D07, Q07, R02, R01, E02, E05, E04, E06, E03, E11, E10, E12, E01 and E14). Almost all items of purchasing behavior seem to be associated with those items of individual pro-environmental activities that concern conservation of energy and water, with the items of participative activities that express information interest, with the two most adopted by consumers items of recycling (bottles and paper) and with some items of the pro-environmental attitudes.

In the third cluster most of the attitudinal items (pro-environmental and recycling) are grouped together in a separate cluster than the behaviors did, as items E07, D11, E15, Q06, Q03, Q14, Q08, Q02, Q10, Q11, Q05, Q15, Q09, Q01, Q04, Q13, Q12, E13, E09, E08 and D08 are joined together.

Only two of the individual activities items are joined here, those that do not demand energetic actions (not throwing rubbish on the ground, try to make less noise).

Take in Figure 1

K-Means cluster analysis was then employed to group cases. This application of cluster analysis is mostly used in marketing research to form relatively homogeneous groups (segments) of consumers for market segmentation purposes (Sudman and Blair, 1998, p. 563). Information concerning the size of the segments and the relative importance of each item into each segment is provided. The method requires specifying in advance the number of clusters that will be obtained. In this study three clusters were specified at a hope that they would express three levels of engagement in ECCB: Higher moderate and lower engagement. All behavioral and attitudinal items were entered in the analysis.

The results presented in Table 2 indicate three consumers' segments as expected. Cluster one containing 177 cases (31.66%) includes consumers, who scored higher than the other two groups in all the behavioral and attitudinal variables. These are the Ecologically Conscious Consumers (ECCs). Cluster two containing 253 cases (45.26%) includes consumers, who obtained average scores in the attitudinal variables and considerably lower scores in the behavioral variables. These consumers might be named Ecologically Concerned Consumers. Cluster three containing 129 cases (23.07%) includes consumers, who obtained the relatively lowest scores in all the behavioral and attitudinal variables. These consumers can be characterized as Ecologically Indifferent Consumers. K- means cluster analysis revealed that consumers who scored higher in one type of ECCB scored higher in the other types as well. Moreover a closer look at K-means results (Table 2) provides the following detailed information as to the segment of ECCs.

Take in Table 2

The Ecologically Conscious Consumers' segment

The consumers, who obtained the higher scores in all items, seem to make environmentally friendly choices most of the times they buy a product, especially in the cases of no significant price difference, as the means of items A01 and A02 indicate. With regard to the recycled paper products, they use to buy them even if they are more expensive than or not as white as the regular stationary (A10, A11). With regard to the ecological detergents, consumers seem less willing to pay more (A06), but they would certainly buy them if they were convinced that they are really environmentally friendly (A09). As to the organics they seem to choose them rather occasionally (A07). They also report permanent involvement in recycling activities, naturally more frequently to those that are more broadly delivered in their district (R01, R02), that is refillable bottles and paper. As to the other Pro-environmental Activities, these consumers never throw rubbish on the ground (D08), they always try to make less noise (D11), they are almost always interested into seeking information about environmental issues (D06, D07) and they use less energy and water most of the times (D09, D10). Rather rarely they seem to contribute money to ecological groups, to take part into environmental protection events, to buy ecological periodicals and even less frequently they are used to offer voluntary work (D01 - D05). ECCs hold strong attitudes especially towards problems that the pollution causes to their personal life and health (E02, E09). They almost absolutely agree that environmental protection is the most important problem of our time (E08). They are very much annoyed with governments and international organizations that do not take the necessary measures to protect the environment (E13). They hold even stronger attitudes towards issues concerning recycling, especially as to the recycling importance to the environmental protection (Q01, Q09), as to the necessity of regulation (Q05) and also as to the societal benefits of recycling (Q15).

Furthermore, an effort was made to examine the demographics of the segments. This effort aimed to specify those demographics that can describe not only each one of the types of ECCB (as ANOVAs

did) but the whole set of the behavioral and attitudinal variables, which have been gathered together in each segment. In order to do this the variable Cluster Membership was created. Cluster Membership is a categorical variable measured on three points, one for each cluster. Chi-square was applied and indicated that statistically significant relationships ($p<0.05$) exist between Cluster Membership and education (graduates), as well as between Cluster Membership and income (higher). Most of graduates and most of those who earn relatively higher incomes fall into ECCs cluster (Table 3)

Take in Table 3

Discussion

The results indicated a moderate level of engagement in ECCB and a high level of environmental attitudes within the Greek consumers. Shrum's et al. (1994) comment that there is a gap between what consumers say and what they do was verified in Greece. Attitudes were found to be rather moderate predictive factors of the behaviors. The results, especially those provided by multiple regression, confirmed Fisbein's and Ajzen's (1974) suggestion that attitude – behavior link should be investigated at the same level of specificity as pro-environmental attitudes is the only capable variable to predict pro-environmental purchasing and recycling attitudes is the only variable to predict recycling behavior. Moreover, hierarchical clustering revealed detailed information concerning sets of attitudes that are joined together with specific sets of behaviors.

As to demographics, it was found that education and income are positively related to all the types of ECCB. In contrast, age, gender and occupation were not established as common, discriminative factors of ECCB in Greece. The use of the L.O.V. to reveal the personality variables of ECCs' profile was not successful. The choice of the L.O.V. was initially based upon its potential ability to be applied in a social environment and to achieve satisfactory correlation with consumer behavior

(Kahle, Beatty and Homer 1986; Novak and MacEvoy, 1990). This argument was not supported as to ECCB in Greece.

No statistically significant evidence of relationship between Environmental Knowledge and any type of ECCB was provided. The length and the difficulties of the measure discouraged respondents to reply. Only 13.8% of the respondents managed to answer all 29 items. The result of this research, regarding knowledge – behavior link, is consistent with those found by Maloney and Ward (1973) and Pickett et al. (1993), while it is inconsistent with those presented by Arbuthnot (1977), Antil (1984) and Schlegelmilch et al. (1996). However, positive relationships were found between environmental knowledge and the attitudinal variables. In any case the potential hierarchy 'knowledge-attitudes-behavior' needs further investigation. This further research direction should better verify our claim that ecological consumer behavior can be conscious.

K-means cluster analysis revealed that Greek consumers, who adopt ecologically related criteria in their purchasing behavior, are the same people who often recycle and take part into other, various pro-environmental activities. This idea contrasts with Roberts' (1996) opinion, expressed previously by Pickett et al. (1993), that ECCB may not be a general behavior pattern and that consumers who enhance one type of ECCB are not the same people who enhance another type as well. Roberts (1996) based his assertion on the limited ability of demographics to explain ECCB. Although Roberts (1996) claimed that his findings are consistent with those of Balderjahn (1988) and Pickett et al. (1993), attention should be paid as to the differences in the design of these projects. For example, Roberts (1996) examined ECCB using one 30-item measure, inclusive of several ecological behavior types, whereas Pickett et al. (1993) used a composite measure representing the conserver consumer. In contrast, Balderjahn (1988) used separate measures and in fact he found different significant demographics for each dimension of his model. In this research, separate measures were used as well, but at least education and income provided statistically significant relationships with all the types of

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ECCB. Moreover, no previous research examined the relationships among the ECCB types, while in this study emphasis was placed upon this particular path.

The estimated size of the Greek ECCs' segment can be argued as rather over-evaluated. The possibility always exists for an over-reporting tendency of respondents in the self-report method, when a frequency scale is used. This limitation can also be attributed to the influence of attitudes, which usually provide relatively high scores to a larger portion of consumers than behavior does. This happens especially in environmental issues, which are highly associated with social desirability (Amyx, DeJong, Lin, Chakraborty and Wiener, 1994; Schlegelmilch et al., 1996).

With regard to the effort of segmenting the Greek market, K-means indicated the existence of three segments of consumers in Greece, similar to those suggested previously by Roper Organization (1992) with concern to the American consumers. Of course differences in studies' methodologies, as well as place and time discrepancies, make any direct comparison effort insecure. However, the segment of Greek ECCs may be viewed as similar to Roberts' (1996) ECCs and similar to Roper Organization's (1992) "true-blue greens" and "greenback greens", who were named by Ottman (1997, p. 22) "active environmentalists" of the American population. The consumers in the second segment may be viewed as similar to Roper's (1992) "sprouts", who were characterized by Ottman (1997, p. 22) as the "swing group". Last, the consumers in the third segment seem similar to the Roper Organization's (1992) "grousers" and "basic browns", who were named by Ottman (1997, p. 22) "not active environmentalists".

Conclusions

Greek consumers who are engaged in ECCB seem to be in the minority of the Greek community, although their attitudes were found to be high in overall. Specific attitudes were found to be more capable of predicting specific behaviors. Our suggestion is that ECCB can be better understood if all

its types are examined under an integrated theoretical framework at the same place an time. Pro-environmental purchasing, recycling and pro-environmental activities are separate, though associated to one another types of ECCB. The attempt to cluster ECCB was found useful in providing fruitful, detailed information about the number, the size and the characteristics of the ecologically related consumers' segments in the Greek market. Hierarchical clustering was useful to understand better the associations among the behavioral and attitudinal aspects of ECCB. K-means cluster analysis indicated three consumers' segments, which were respectively named ecologically conscious, concerned and indifferent consumers. A considerable segment of ECCs does exist in the Greek market. These respondents obtained the relatively higher scores in all attitudes and behaviors. Thus, it is concluded that consumers who enhance one type of ECCB are more likely to enhance the other types as well. These people are influenced by their strong, positive attitudes; most of graduates and most of those who earn relatively higher incomes are ECCs.

Any ecological strategy should target for purchasers among recyclers and/or activists and for recyclers among purchasers and/or activists. Advertisements of ecological products should be placed nearby recycling bins and recycling promotion material nearby Super Market shelves, where ecological products are merchandised. It is a shame that the packaging of ecological products is often neither recycled nor recyclable. Even leaflets that promote recycling programs are not made by recycled paper. People, who belong to ecological groups, or buy ecological periodicals, as well as the audience of ecologically related mass media programs, should be the leading target group of 'green' offerings. Additionally, business' strategic alliances with ecological groups and organizations, as well as the productive use of eco-labels, might be taken into consideration.

An optimum marketing strategy should provide and promote ecological products of no significant differences with the conventional products in terms of price and efficacy. Schlegelmilch et al. (1996) for U.K. and Litvan (1995) for U.S.A. similarly suggested that green products should perform

competitively in other dimensions, besides their environmental benefits. Given that the attitudinal scores are remarkably higher than those concerning behaviors, Greek consumers need to be encouraged to "act on their concern" as Roberts (1996) suggested for the American consumers as well. Appropriate communication campaigns should be directed at increasing concern towards issues referring to consumers' eco-centrisism and perceived importance of natural resources conservation. Consumers need to be persuaded that their buying choices truly contribute to the environmental protection.

Local authorities, in charge of the recycling programs should understand that although consumers' understand the contribution of recycling to the environmental protection, they find the procedure very inconvenient. Communication campaigns should aim at minimizing the perceived importance of consumers' inconvenience by maximizing the importance of recycling benefits. More recycling bins around neighborhoods should be placed to make at least transportation less inconvenient.

Future research is certainly needed to assist to an even better understanding of ECCB. The cognitive and the psychographic aspects of the ECCs' profile remain still in the shadow. Research is needed to investigate consumers' preferences concerning specific product categories. The insights of the purchasing and non-purchasing pro-environmental activities are not well revealed yet. As to pro-environmental post-purchasing behaviors, it is noted that other types - besides recycling - were all found to be restricted by people's materialistic values (Tilikidou and Delistavrou, 2004). Materialism (people's beliefs about possessions) might be found a key-factor to understand more deeply ECCB as a whole. Last, a very interesting new path might be to explore the most appropriate communication mix for an effective ecological strategy.

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Table 1
One-way Analysis of Variance

			Between Groups	
Pro-environmental Purchasing Behavior	**Group**	**Means**	**F**	**Sig.**
Education	ELEMENTARY HIGH SCHOOL GRADUATE	38.7674 43.9361 47.3085	7.906	.000
Income	<7,500 € 7,500 € - 16,000€ >16,000€	40.6466 45.8309 52.3462	13.195	.000
Recycling Behavior				
Education	ELEMENTARY HIGH SCHOOL GRADUATE	14.8217 18.1197 19.8852	14.052	.000
Income	<7,500 € 7,500 € - 16,000€ >16,000€	16.9277 17.7772 20.4265	4.798	.009
Occupation	PROFESSIONAL EMPLOYEE HOUSEPERSON & OTHER	17.8365 19.2118 16.5789	5.327	.005
Participative Activities				
Education	ELEMENTARY HIGH SCHOOL GRADUATE	16,0394 18,8423 20,6393	11.805	.000
Income	<7,500 € 7,500 € - 16,000€ >16,000€	17,3889 19,3571 20,7353	5.489	.004
Occupation	PROFESSIONAL EMPLOYEE HOUSEPERSON & OTHER	19.7476 19.1244 17.7135	2.752	.045
Individual Activities				
Age	15 - 24 25 - 34 35 - 54 55 <	18.2308 20.5271 21.5977 22.7519	17.568	.000
Education	ELEMENTARY HIGH SCHOOL GRADUATE	21.1094 20.5035 21.9032	3.079	.047
Occupation	PROFESSIONAL EMPLOYEE HOUSEPERSON & OTHER	20.7143 21.8213 20.0106	5.842	.003

Table 2
K-Means cluster analysis

		Cluster 1 (177 cases)		Cluster 2 (253 cases)		Cluster 3 (129 cases)	
		Mean	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
Pro-environmental Purchasing Behavior measure							
A01	I choose the environmentally friendly alternative of a product, if there is one, regardless of price	4.99	1.44	3.46	1.57	2.22	1.27
A02	I choose the environmentally friendly alternative of a product, if there is no significant price difference	5.79	1.44	4.84	1.66	2.72	1.71
A03	I am interested in asking about the environmental consequences of a product before buying it	5.33	1.68	4.12	1.87	2.51	1.52
A04	I prefer recycled paper products	5.54	1.54	4.28	1.82	2.59	1.42
A05	I try to find eco-label products	5.46	1.54	4.10	1.67	2.33	1.30
A06	I prefer environmentally friendly detergents, even if they are more expensive	5.09	1.54	3.28	1.82	1.82	1.32
A07	I prefer to buy organic fruits and vegetable	4.87	2.15	3.90	2.20	2.49	2.01
A08	I prefer to buy environmentally friendly detergents, even if they are not equally effective	3.19	1.80	2.00	1.44	1.41	0.87
A09	I would change my usual detergent brand for another more friendly to the environment	6.01	1.38	4.90	1.69	2.92	1.54
A10	I prefer the recycled paper products, even if they are more expensive	5.30	1.72	3.44	1.95	1.70	1.06
A11	I choose the recycled paper products, although they are not as white	5.51	1.69	3.96	1.99	1.97	1.07
Pro-environmental Activities measure							
Participative Activities							
D01	I take part into cleaning shore, parks, yards etc.	2.81	1.87	1.71	1.31	1.33	0.86
D02	I take part into environmental protection events	3.03	1.88	1.61	1.09	1.20	0.63
D03	I buy ecological magazines and/or other printed material	3.14	1.99	1.70	1.16	1.43	0.89
D04	I contribute money to ecological groups and organizations	3.33	1.96	1.73	1.17	1.33	0.69
D05	I voluntarily work for ecological groups and organizations	2.51	1.74	1.45	1.02	1.18	0.54
D06	I have discussions with my family and/or friends about environmental issues	5.59	1.39	4.21	1.48	2.94	1.22
D07	I listen to the radio or watch television programs on ecology	5.63	1.49	4.42	1.63	2.98	1.45
Individual Activities							
D08	I do not throw rubbish on the ground	6.81	0.75	6.60	0.99	5.82	1.62
D09	I try to use less water	5.03	2.14	3.53	2.22	3.34	2.01
D10	I try to use less energy	5.34	1.87	4.37	1.99	3.89	2.10
D11	I try to make less noise	6.25	1.38	5.93	1.62	5.24	1.92
Pro-environmental Post-Purchasing (Recycling) Behavior measure							
R01	Return glass bottles	6.31	1.13	5.41	2.02	3.84	2.25
R02	Recycle paper	6.05	1.46	4.15	2.23	2.16	1.63
R03	Recycle aluminum cans	5.50	1.87	2.61	1.90	1.53	0.86
R04	Recycle plastic bottles	3.98	2.40	1.73	1.26	1.27	0.65
R05	Recycle glass	4.00	2.42	2.09	1.82	1.46	1.16

		Cluster 1 (177 cases)		Cluster 2 (253 cases)		Cluster 3 (129 cases)	
		Mean	*Std. Dev*	*Mean*	*Std. Dev*	*Mean*	*Std. Dev*
Pro-environmental Attitudes measure							
E01	I often get annoyed when I think of how much water is wasted	5.67	1.40	4.57	1.77	4.38	1.69
E02	Pollution does not affect my personal life *	6.34	1.43	5.69	1.95	5.11	1.81
E03	I can not follow environmentalists' and ecologists' debates*	5.63	1.62	5.10	1.69	3.91	1.57
E04	I have never been seriously concerned about issues such as ground water and sea pollution*	6.27	1.17	5.79	1.20	4.41	1.59
E05	I don't think that I have anything to do with animals' or plants' destruction*	5.91	1.44	5.33	1.72	4.38	1.64
E06	I have never been concerned with rare species extinction*	6.22	1.28	5.74	1.36	4.64	1.60
E07	I get very angry about experiments on animals using dangerous products	6.02	1.74	5.72	1.64	5.04	1.68
E08	Environmental protection is the most important problem of our times	6.53	0.90	6.32	1.00	5.67	1.28
E09	Pollution is the most serious threat for our health and for the health of our children	6.61	0.90	6.55	0.74	6.01	1.17
E10	The benefits of modern consumer products are more important than the pollution, which results from their production and use*	5.38	1.75	4.99	1.72	3.86	1.50
E11	Rapid technology improvement is causing more problems than benefits	5.03	1.80	5.09	1.58	4.08	1.76
E12	I don't believe that the environment would be protected if we used less water, electricity and oil*	5.40	1.81	4.68	1.74	3.95	1.59
E13	I am annoyed with Governments and International Organizations that do not take the necessary measures to protect the environment	6.47	1.30	6.46	0.79	5.60	1.19
E14	Humans were created to rule over the rest of nature*	5.06	2.07	4.35	2.24	4.02	1.79
E15	Over-consumption is highly responsible for the environmental destruction	6.12	1.06	5.82	1.21	5.01	1.49
Recycling Attitudes measure							
Q01	Recycling is important	6.77	0.45	6.51	0.66	5.78	1.19
Q02	Each consumer can contribute to the solution of the litter problem in his/her district	5.87	1.31	5.85	1.20	5.11	1.28
Q03	Recycling benefits are worth-while my time and effort	6.49	0.72	6.11	0.84	5.09	1.16
Q04	Recycling helps to the natural resources conservation	6.68	0.61	6.38	0.92	5.72	1.15
Q05	Government should issue regulations about the use of recycled and recyclable materials in products packaging	6.76	0.45	6.44	0.85	5.68	1.27
Q06	Consumers should force the producers to use recyclable materials in their products packages	6.39	0.93	6.05	1.01	4.91	1.39
Q07	It is rather inconvenient to sort out and transport the recycling materials*	5.24	2.01	4.75	1.95	2.82	1.55
Q08	It is my personal responsibility to help recycling efforts	6.36	0.98	6.05	1.05	5.00	1.21

	Cluster 1 (177 cases)		Cluster 2 (253 cases)		Cluster 3 (129 cases)	
	Mean	*Std. Dev*	*Mean*	*Std. Dev*	*Mean*	*Std. Dev*
Q09 Recycling is a great help to environmental protection	6.72	0.87	6.62	0.63	6.09	0.91
Q10 It is useless to recycle as long as not many other people do the same*	6.46	1.11	5.56	1.69	4.00	1.77
Q11 Recycling is more fuss than benefit*	6.61	0.98	6.27	0.87	5.37	1.41
Q12 Recycling reduces litter going to the landfill sites	6.55	0.89	6.37	0.90	5.76	1.32
Q13 Recycling contributes to energy conservation	6.57	0.77	6.22	0.97	5.67	1.35
Q14 I get satisfaction by taking part into recycling	6.51	0.79	5.95	1.01	4.71	1.27
Q15 Recycling benefits return back to the society	6.72	0.68	6.49	0.85	5.76	1.17

* Reverse coded items

Table 3
Chi square between cluster membership and demographics

| Cluster Membership with	Ecologically Conscious Consumers	Ecologically Concerned Consumers	Ecologically Indifferent Consumers	Total
Gender	*Value (x): 5.616*	*df: 2*	*Sig.: 0.060*	
Age	*Value (x^2): 2.488*	*df: 6*	*Sig.: 0.870*	
Education	*Value (x^2): 30.294*	*df: 4*	*Sig.: 0.000*	
Primary school	16.2%	48.5%	35.4%	100.0%
High school	31.8%	46.9%	21.3%	100.0%
Graduate	44.8%	40.0%	15.2%	100.0%
Whole sample	31.1%	45.7%	23.3%	100.0%
Income	*Value (x^2): 10.886*	*df: 4*	*Sig.: 0.028*	
<7,500 €	22.6%	50.0%	27.4%	100.0%
7,500 € - 16,000€	34.1%	44.9%	21.1%	100.0%
>16,000€	47.8%	42.0%	10.1%	100.0%
Whole sample	31.8%	46.4%	21.8%	100.0%
Occupation	*Value (x^2): 9.691*	*df: 8*	*Sig.: 0.064*	
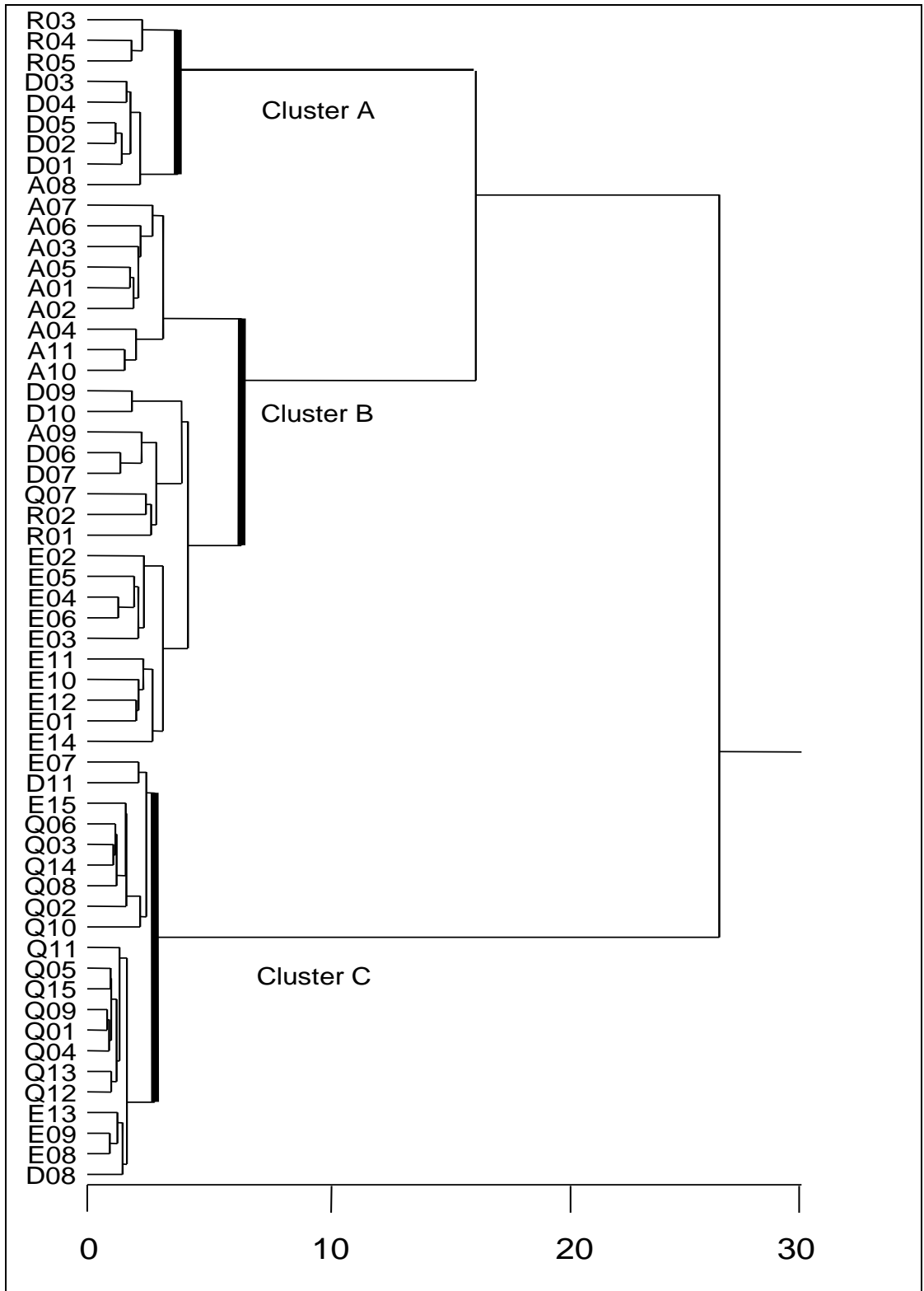
Figure 1: Hierarchical cluster dendrogram