

# INVESTIGATE VIA INTERNET THE CONSUMER'S WILLINGNESS TO PAY FOR THE SAKE OF THE ENVIRONMENTAL PROTECTION

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## ABSTRACT

This paper investigates the consumer's willingness to provide financial support to the cause for environmental protection. This study is unique because it was carried out via e-mail using a questionnaire, and the answers were recorded automatically in a database which was created for this purpose. The sample was random and the participants were notified by e-mails. The recipients of the e-mails were urged to forward the questionnaire to others. The total number of questionnaires under investigation reached 1000.

The format of the investigation was as follows: First, we would ask their opinion about the degradation of the environment. Upon receiving an answer stating that the environment was indeed being degraded then we would ask if they were willing to pay a small monthly fee towards its restoration. Those who thought otherwise, were asked to state their opinions. We took into account the opinions regarding the environmental degradation as well as to demographic characteristics when we evaluated their willingness to pay or not.

*Keywords:* Willingness to pay, environmental behavior.

## 1. Introduction

Only recently people have started paying serious attention to the problem of environmental degradation and many of them have expressed willingness to pay to fix the problem and/or reverse the degradation process. This willingness to financially contribute however is always accepted as readily as one would think.

## 2. Methodology

### 2.1. Purpose of research

The study focuses on evaluating the answers of a questionnaire that was posted on a website<sup>1</sup>. The sample of respondents was random and was prompted to participate in the survey via e-mails, also a large

number of recipients forwarded the surveys to third parties. In conclusion we evaluated 1000 fully completed questionnaires. Table 1 shows the demographic characteristics of the sample.

### 2.2. The questionnaire

This survey used the "range of responsible consumer behaviour" (*Socially Responsible Consumption Behavior scale - SRCB*) built by J. R. Antil and Bennet (1979). The use of scale was dictated by the fact that this has significant advantages (Antil J., 1984, Oikonomou et al., 2008). Initially, a list of 30 questions expressed the views of consumers about the environmental degradation and their desire to bear the cost for protection of the environment. Then they proposed various amounts to pay for environmental protection.

Some of the respondents were asked to answer to what extent they agree or disagree, on a scale Likert 7

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<sup>1</sup>

<http://oikonomou.homeftp.net/statistics/PayforEnvironmentalProtection>.

degrees. Among the statements were reverse statements that are scored in reverse to the processing of data. We tried to determine their willingness to pay and their judgement in relation to the monthly cost of entertainment.

Table 1. Quality characteristics of sample.

AGE	Frequency	Percent
to 25 years	276	27.6
from 26 to 40 years	621	62.1
from 41 to 55 years	103	10.3
over 55 years	0	0.0
Sum	1000	100
SEX	Frequency	Percent
Female	615	61.5
Male	385	38.5
Sum	1000	100
FAMILY STATUS	Frequency	Percent
Single	754	75.4
Married	246	24.6
Sum	1000	100
CHILDREN	Frequency	Percent
No child	814	81.4
One child	64	6.4
Two children	106	10.6
Three children	12	1.2
More than 3	4	0.4
Sum	1000	100
EDUCATION	Frequency	Percent
Primary education	0	0.0
Secondary education	194	19.4
University education	460	46.0
Post. Studies	346	34.6
Sum	1000	100
OCCUPATION	Frequency	Percent
Civil servant	190	19.0
Private staff	309	30.9
Student	259	25.9
Freelancer	191	19.1
Unemployed	47	4.7
Household	2	0.2
Retired	2	0.2
Sum	1000	100
AVERAGE SALARY	Frequency	Percent
Less than 800 €	400	40.0
801-1200 €	289	28.9
1201-1400 €	153	15.3
>1401 €	158	15.8
Sum	1000	100

Initially we recorded the amount they spend on a monthly basis for their entertainment. We then asked the respondents to indicate whether they wish to pay a

certain amount of money on a monthly basis to support environmental protection. The figures suggested that the answers were a 5€, 10€ and 3€. In the end they were asked to indicate the maximum amount they are prepared to pay on a monthly basis. Our analysis examined the statements regarding the above figures. The maximum amount indicated their willingness to pay as a percentage of monthly expenditure on entertainment.

Assessing the willingness of payment was in accordance with the views expressed on environmental degradation and with the demographic characteristics of the sample. Based on the amount spent on a monthly basis for the entertainment, the investigation identified two elements:

1. If consumers are aware and to what extent the environmental problems affect the evaluation of the demographics.
2. To what extent they are willing to bear the personal costs and sacrifices necessary to protect the environment, especially if the sacrifices are translated into economic burden.

### 3. Statistical treatment of data

The data was processed with SPSS using the factorial analysis. The aim was to simplify the large and complex data set by analysis of correlations between them. Given the exploratory nature of research, the analysis was limited to identifying the key elements that explain the term possibly not existent probably correlation matrix. Our sample satisfies the conditions of the method, since the respondents are beyond 100 and this number is more than twice the number of questions. The analysis was done by rotating the factors (factor rotation) and using the rotation method Varimax. The analysis revealed 6 groups of questions related to each other and explain the 51.87% of the total variance. Analysing the content of the questions of each group we determined the characteristic of each of these concerns. Based on these data we created the following variables: *“personal sacrifices”*, *“willingness to pay”*, *“concern for the environment”*, *“corporate responsibility”*, *“willingness to protest”* and *“non-personal sacrifices”* whose value is equal to average of marks given by each respondent in each category of proposals represents. The reliability of these variables, determined according to the method of Cronbach, is satisfactory (Table 2).

The dummy variables were created to represent each category of variables relative to the base category. For example, the variable “sex” category basis as deemed category “woman”, and this was the value of 1, while the category “man” was the value 0. As mentioned above participants were asked to indicate whether they wish to contribute to the environmental protection, paying an amount of money per month.

Table 3 presents the frequency of responses and the percentage. We note that depending on the amount they

offered to pay, the proportions of positive and negative responses vary.

To have another measure for assessing affordability (economic comfort) beyond income, we asked from the responders to indicate the amount spent on a monthly basis for their leisure time.

**Table 2.** Cronbach coefficients for the aggregated categories.

Grouped categories	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of questions
G1 "Willingness payment"	0.850	0.848	6
G2 "Corporate responsibility"	0.679	0.682	4
G3 "Personal sacrifices"	0.688	0.703	5
G4 "Willingness to protest"	0.618	0.659	6
G5 "Concern for the environment"	0.573	0.604	4
G6 "Non-personal sacrifices"	0.575	0.596	3

**Table 3.** Agreement to pay based on a monthly payment amount.

Agreement to pay	5€	10€	3€
Yes	532 (53.2%)	346 (34.6%)	953 (95.3%)
No	468 (46.8%)	654 (65.4%)	47 (4.7%)

The frequency and percentage breakdown of responses is presented in Table 4. Table 5 presents the frequencies and the percentage breakdown of the maximum amounts that are willing to pay on a monthly basis to support environmental protection.

**Table 4.** Monthly expenditure on leisure time.

€month	Frequency	Percent	Cumulative Percent
0-50	240	24.0	24.0
51-100	277	27.7	51.7
101-150	156	15.6	67.3
151-200	147	14.7	82.0
201-400	146	14.6	96.6
Over 401	34	3.4	100.0
Sum	1000		

In Tables 6 and 7 below shows the correlation of data with the greatest interest.

#### 4. Restrictions

To interpret the results one should take into account the following limitations of the investigation: For the survey we used a sample of convenience and not sample whose demographic characteristics are comparable to the general population.

**Table 5.** Maximum monthly expenditure on environmental protection.

€month	Frequency	Percent	Cumulative Percent
0	406	40.6	40.6
1-5	204	20.4	61.0
6-10	163	16.3	77.3
11-20	148	14.8	92.1
21-30	31	3.1	95.2
31-40	3	0.3	95.5
41-50	32	3.2	98.7
51-100	10	1.0	99.7
101-150	2	0.2	99.9
Over 151	1	0.1	100
Sum	1000	Average	9.26 €/month

An example is the education level, where the university graduates reached 46%, while those who have completed post-graduate studies, reached 34.6%. If one considers the situation in the general population he understands that the apportionment of the education levels of the sample is a major limiting factor of the investigation analysis. The same holds true for age, where people over 55 are not represented. Finally, we note the relatively small number of observations for pensioners and those engaged in household. Given the composition of this sample, it would be risky at least trying to generalize the conclusions arising from this survey in the total population (Oikonomou S., 2008).

The nature and means of limiting our research to a large extent the problem of bias, since the respondent does not indicate their identity, but it is necessary to ensure the anonymity of the Internet. Usually, most studies of socially desirable behaviour, suffer from the bias of "socially desirable" response, known as "halo effect". Respondents know what is expected of them by the community and respond accordingly (Roberts J.A., 1996).

Consumers can claim that they are buying green products while in reality they do not, either because they feel guilty, or because they do not make green purchasing choices. Besides they believe that they want to hear the questioner (Oikonomou S., 2008).

**Table 6.** Correlations of variables.

		G1	G2	G3
Female	Correlation	.113**	.171**	.179**
	Sig.	.000	.000	.000
Up to 24 age	Correlation	.057	-.078*	-.042
	Sig.	.074	.014	.183
From 25 to 40 age	Correlation	-.057	.032	.023
	Sig.	.069	.315	.472
From 41 to 55 age	Correlation	.009	.064*	.026
	Sig.	.787	.044	.417
First graduate	Correlation	.052	-.040	-.003
	Sig.	.101	.208	.927
Over 1400 €/month	Correlation	.015	.004	-.069*
	Sig.	.628	.893	.029
Civil servant	Correlation	.034	.038	.060
	Sig.	.284	.234	.057
Private staff	Correlation	-.013	.033	.053
	Sig.	.688	.295	.093
University student	Correlation	.054	-.081*	-.068*
	Sig.	.087	.010	.032
Freelancer	Correlation	-.056	.002	-.093**
	Sig.	.075	.950	.003
Unemployed	Correlation	-.035	.008	.063*
	Sig.	.275	.806	.048
Cities	Correlation	-.006	.068*	-.003
	Sig.	.843	.032	.933
Towns	Correlation	.006	-.068*	.003
	Sig.	.843	.032	.933
PLT 0_50	Correlation	-.057	.003	.079*
	Sig.	.070	.927	.012
PLT 151_200	Correlation	.021	-.053	-.034
	Sig.	.514	.095	.277
PLT over 400	Correlation	-.036	-.052	-.099**
	Sig.	.260	.100	.002
PEP 0	Correlation	-.545**	-.113**	-.150**
	Sig.	.000	.000	.000
PEP 1_3	Correlation	-.059	-.070*	-.071*
	Sig.	.060	.026	.025
PEP 4_5	Correlation	.100**	.030	.033
	Sig.	.002	.348	.301
PEP 11_20	Correlation	.262**	.032	.071*
	Sig.	.000	.306	.025
PEP 21_50	Correlation	.239**	.085**	.120**
	Sig.	.000	.007	.000
PEP over 51	Correlation	.137**	.050	.033
	Sig.	.000	.112	.298

PLT. Pay for Leisure Time (€/month).

PEP. Pay for Environmental Protection (€/month).

**Table 7.** Correlations of variables.

		G4	G5	G6
Female	Correlation	.114**	.161**	.094**
	Sig.	.000	.000	.003
Up to 24 age	Correlation	-.121**	-.027	-.108**
	Sig.	.000	.391	.001
From 25 to 40 age	Correlation	.088**	.049	.066*
	Sig.	.005	.124	.036
From 41 to 55 age	Correlation	.038	-.038	.053
	Sig.	.233	.233	.093
First graduate	Correlation	-.039	-.004	-.096**
	Sig.	.220	.902	.002
Over 1400 €/month	Correlation	-.027	-.057	.019
	Sig.	.387	.071	.547
Civil servant	Correlation	.001	.010	.082**
	Sig.	.977	.761	.009
Private staff	Correlation	.081*	.022	.032
	Sig.	.010	.493	.307
University student	Correlation	-.130**	-.043	-.135**
	Sig.	.000	.176	.000
Freelancer	Correlation	.015	-.021	-.005
	Sig.	.634	.500	.882
Unemployed	Correlation	.047	.047	.057
	Sig.	.137	.135	.071
Cities	Correlation	.032	.068*	.006
	Sig.	.310	.032	.845
Towns	Correlation	-.032	-.068*	-.006
	Sig.	.310	.032	.845
PLT 0_50	Correlation	.026	.046	.025
	Sig.	.408	.148	.431
PLT 151_200	Correlation	-.067*	-.045	-.019
	Sig.	.034	.156	.547
PLT over 400	Correlation	-.039	-.029	-.056
	Sig.	.223	.366	.074
PEP 0	Correlation	-.036	-.009	-.174**
	Sig.	.259	.782	.000
PEP 1_3	Correlation	-.046	-.025	-.034
	Sig.	.148	.424	.276
PEP 4_5	Correlation	.046	-.017	.014
	Sig.	.142	.589	.669
PEP 11_20	Correlation	.011	-.027	.115**
	Sig.	.723	.391	.000
PEP 21_50	Correlation	.090**	.056	.091**
	Sig.	.004	.075	.004
PEP over 51	Correlation	.052	.039	.045
	Sig.	.101	.224	.153

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Nevertheless, the interpretation of a research studying the existence of a willingness sum payment or acceptance of higher prices for green products should be handled with care. The experts warn that the survey expressing a willingness to pay should be used rather as an indication of consumer preferences, rather than a literal prediction of behaviour (Laroche M., et al., 2001).

This does not mean, however, that these researches are without any utility. In general, revealing the public feeling on the issue. Subject followed the correct procedures for research; the results can be used to focus marketing efforts on more attractive terms of demographic, market segments (Bentham P., 1998).

## 5. Results

Based on the statements of 30 questions assessing their environmental awareness, respondents demonstrate their availability and willingness to pay, when they are asked to indicate the amount to be paid, indicate greater amounts than they originally proposed. Also, more sensitive (according to their statements in 30 questions), respondents are willing to pay even larger sums up to 50€

Women according to their statements are more aware and sensible to issues of environmental protection, expressing their concern for environmental degradation, the willingness to protest, to force companies to take responsibility of their actions, while expressing willingness to bear the financial burden. Also women say that they are willing to pay a greater percentage of environmental protection, compared with men.

Persons up to 24 years are unwilling to pay and protest. They believe, and it is not prepared to make personal sacrifices. You may delegate responsibility to the state and public authorities. Since the age of respondents increases, the awareness of environmental problems increases too. People aged 41-55 say they intend to pay any amount, but when they proposed to increase the proportion of expenditure on environmental protection in relation to expenditure for entertainment or to pay certain sums of money, they do not accept.

For married people is not possible to draw any specific conclusions, only that they are prepared to pay a negative amount for an environmental protection, probably because of limited financial capacity. The existence or not of the children did not affect responses.

The result with the greatest interest is the evaluation of responses based on education. Respondents holding a postgraduate qualification, declare their willingness to pay, However when they are proposed an amount of money, they withdraw their declaration. Unlike the graduate school or high school respondents, while they declare their willingness to pay, increase the proportion of expenditure on environmental protection in connection with their entertainment expenses. Except graduates because of their studies and broader

knowledge to recognize environmental degradation (local and global) and their greater financial comfort (comparing the reported research income), be more willing to pay a amount. This is not proved in practice during our evaluation of the results.

Regarding income, those with income less than 800€ a month, do not indicate their willingness to pay is largely prepared to increase the percentage of money for environmental protection on their spending on entertainment. Unlike the highly paid, with more than 1,400€ a month, saying they are concerned about environmental degradation, and therefore are not willing to pay a financial consideration.

Civil servants are more willing to pay, but in practice to accept the burden of payment, while private employees are negative to pay this amount as fixed. The student do not seem concerned about the environment, and neither is willing to pay for environmental protection. It is not prepared to increase the proportion of expenditure on environmental protection in relation to expenditure on entertainment. Finally, residents of major urban centers while more sensitive state in relation to the inhabitants of the province is not prepared for personal sacrifice, when they are accompanied by financial sacrifices or intent of payment.

## 6. Conclusions

Note that the effects of correlations should not be interpreted as causal relationships. The independent variable that can predict a good slave, does not mean that cause it. Nobody excludes the dependent variable is one that causes the independent, yet both are caused by a third factor not considered in the report.

The findings on certain aspects only coincide with those of previous investigations (Oikonomou S. and Drosatos G., 2009). Gender successfully provides most of the items examined, leading us to conclude that women in Greece are more aware than men in relation to environmental issues and much more willing to translate this positive disposition towards the protection of ecological balance specific actions and particular to specific consumer behaviours. This point is of particular importance for Greece, where women, in the vast majority of households choose and they purchase more products of everyday use. Perhaps this attitude to women is because the social roles of women familiar with the assessment of the needs of others, giving them a further incentive to demonstrate socially responsible behaviour.

In contrast, however, with most studies abroad are not given a reply on the role of age. In these investigations, however, opinions differ. Some researchers relate the ecological behaviour of young people, while others believe it is likely to occur in old age. In our case no evidence that would suggest quite the one or the other view. Shown a trend towards older people are more willing to incur cost to enhance environmental protection. Large role played by the economic situation

and particularly the assessment of environmental awareness.

The findings may prove useful for the purposes of public policy in that regard:

- The creation of infrastructure such as the evaluation and approval of project financing for waste management.
- Research, such as the use of soft forms of energy.
- Education, including teaching environmental education in schools.
- The laws, stricter penalties for businesses that pollute.
- The desired environmental characteristics of products for pricing.

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