

Personal Attitudes in Environmental Protection

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ABSTRACT: Concern for the environment is a constantly growing phenomenon. Awareness of most people and governments in the world with regard to this question has risen. Sometimes, this position is inversely proportional to economic growth, leading to a situation where a more environmental stance on the part of end users has often not been supported by more restrictive environmental protection laws. This study is intended to analyse the importance individual behaviours, attitudes and values have in relation to the environmental actions of various countries, using the information supplied by the World Values Survey Association. Empirical analysis is approached using a model of structural equations in which the intensity and sign of relationships can be seen.

Key words: Environment, Structural equations, Values, Attitudes

INTRODUCTION

Environmental concern has been considered one of the biggest problems in the world. There is a wide range of studies which have examined environmental preferences (Segarra-Ona *et al.*, 2011; Martinez-Paz and Perni, 2011; Lahijanian, 2012). Interest in environmental attitudes began at the beginning of 1970 (Bordand O'Connor, 1997). In this sense, high levels of environmental concern have been developed in recent years and responsible behaviour is increasingly considered desirable (Scott and Willits, 1994; Mondéjar-Jiménez *et al.*, 2010; Garau *et al.*, 2011; Ahmed and Abdella Elturabi, 2011; Lei *et al.*, 2011; Kanokporn and Iamaram, 2011; Mossalanejad, 2012). Concern for the environment has brought about a large number of actions in the last 30 years intended to reduce or reverse environmental degradation. A large number of initiatives are being undertaken, including a wide range of international agreements to encourage respect for the environment (Bruni *et al.*, 2011; Perez-Caldern *et al.*, 2011; Pirani and Secondi, 2011; Garcia-Pozo *et al.*, 2011; Spanou *et al.*, 2011; Junquera, 2012). Some studies highlight the importance of encouraging the environment in a favourable context (De Young, 1996; Geller, 2002; Peiró-Signes *et al.*, 2011; Mossalanejad, 2011; Arsalan *et al.*, 2012; Moghimi and Alambeigi, 2012). These environmental agreements require radical

changes in energy production and consumption in both industrialized and developing countries. Many governments and the European Union in particular agree on the need to increase efforts to protect the environment throughout the world, in order to reduce global warming (Franzen and Meyer, 2010).

Although it is true that these changes, such as those thought necessary for sustainability, are slowly taking place, the gap between attitudes and behaviour in the sphere of the environment is increasingly evident, because while awareness is notably increasing, active respect for the environment increases at a slower rate (Stern *et al.*, 1995). Although some authors make a positive connection between environmental concern and wealth (Diekmann and Franzen, 1999; Franzen, 2003), it needs to be emphasised that for this to happen fundamental changes in the behaviour of producers and consumers are required. Therefore, the public must be prepared to accept the extra costs related with sustainable production in environmental terms (Franzen and Meyer, 2010). Numerous studies in the literature examine environmental preferences (Whitehead, 1991; Stevens *et al.*, 1994; Danielson *et al.*, 1995; Cameron and Englin, 1997; Blomquist and Whitehead, 1998; Carlsson and Johansson-Stenman, 2000; Popp, 2001; Dupont, 2004; Bulte *et al.*, 2005), and those which include the effects

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of sociodemographic variables and other socioeconomic factors (Engel y Pötschke, 1998; Hidano et al, 2005). Also Torgler and García-Valiñas (2007) include thorough analysis of certain variables, some of these studies concentrating on particular variables such as age, sex, marital status, etc. However, it is hard to find studies of a country or group of countries and which take the perspective of general environmental harm into account (Witzke y Urfei, 2001; Israel and Levinson, 2004; Torgler and García-Valiñas, 2007). Comparison of different countries is very interesting because of the cultural and institutional influences. This study intends to be the first to introduce the way in which people's individual environmental attitudes are defined, using the information provided by the World Values Survey and European Values Survey (WVSA, 2011).

MATERIALS & METHODS

Numerous authors have used the database from the World Values Survey. Some have analyzed the variables related with religion, development, and political attitudes (Inglehart *et al.*, 2008; Inglehart and Welzel, 2010; Breznau *et al.*, 2011). For the empirical analysis, individual data from the World Values Survey, a representative survey containing the indicators and variables necessary to estimate the constructs presented, have been taken. A total of 17,000 observations belonging to a representative set of the world population have been used with the aim of explaining environmental actions based on values, attitude and proactivity. To explain each of the latent factors, a total of ten items from the World Values Survey were used, as shown in the following Table:

Table 1. Composite latent factor

Latent factor	Item
Environment values	Human & nature
	Environmental problems can be solved without any international agreements to handle them
	Humanity has a bright or bleak future
Environment attitude	Increase in taxes if used to prevent environmental pollution
	Would buy things at a 20% higher price if it helped to protect environment
	Protecting environment vs. Economic growth
Environment proactivity	Attend meeting, signed petition
	Contributed to environmental organization
Environment actions	Chosen products that are better for environment
	Recycle
	Reduce water consumption

Consequently, the current work aims to test three basic hypotheses about the relations between the latent factors:

- ✓ Hypothesis 1: Environmental values have a positive influence on the other latent factors.
 - H1.1: Environmental values have a positive influence on environmental attitudes.
 - H1.2: Environmental values have a positive influence on proactivity.
 - H1.3: Environmental values have a positive influence on environmental actions.
- ✓ Hypothesis 2: Environmental attitude has a positive influence on proactivity and on actions.
 - H2.1: Environmental attitude has a positive influence on proactivity.
 - H2.2: Environmental attitude has a positive influence on actions.
- ✓ Hypothesis 3: Environmental proactivity has a positive influence on environmental actions.

To confirm these hypotheses, the authors start from a reflective model and use the partial least squares technique, which does not require the assumption of variable normality and which is appropriate for research models aiming to predict the effects of some variables on others. Authors such as Anderson and Gerbing (1988), Barclay *et al.* (1995), and Chin *et al.* (2003) endorse this choice, and recommend the technique over maximum likelihood techniques in studies where the theory is not solidly established.

RESULTS & DISCUSSION

For the structural submodel, following the theoretical framework set out in the previous section, the environment action variable was regarded as exogenous, liable to affect the other factors. The estimate was made using the partial least square (PLS) method with the program SmartPLS 2.0.M3 (Ringle *et al.*, 2005).

The results obtained for the submodel bear out the choice of indicators. This outcome also constitutes a measure of the validity of the questionnaire used to capture the four latent dimensions. The usual goodness of fit measure, proposed in Tenenhaus *et al.* (2005), is the geometric mean of the average communality (outer model) and the average R^2 (inner model), with a value of 0.729.

As to the reliability of the instrument of measurement, the Cronbach's alpha value for all the latent variables is greater, as shown in Table 2. The composite reliability indices are also greater than 0.5 in all cases.

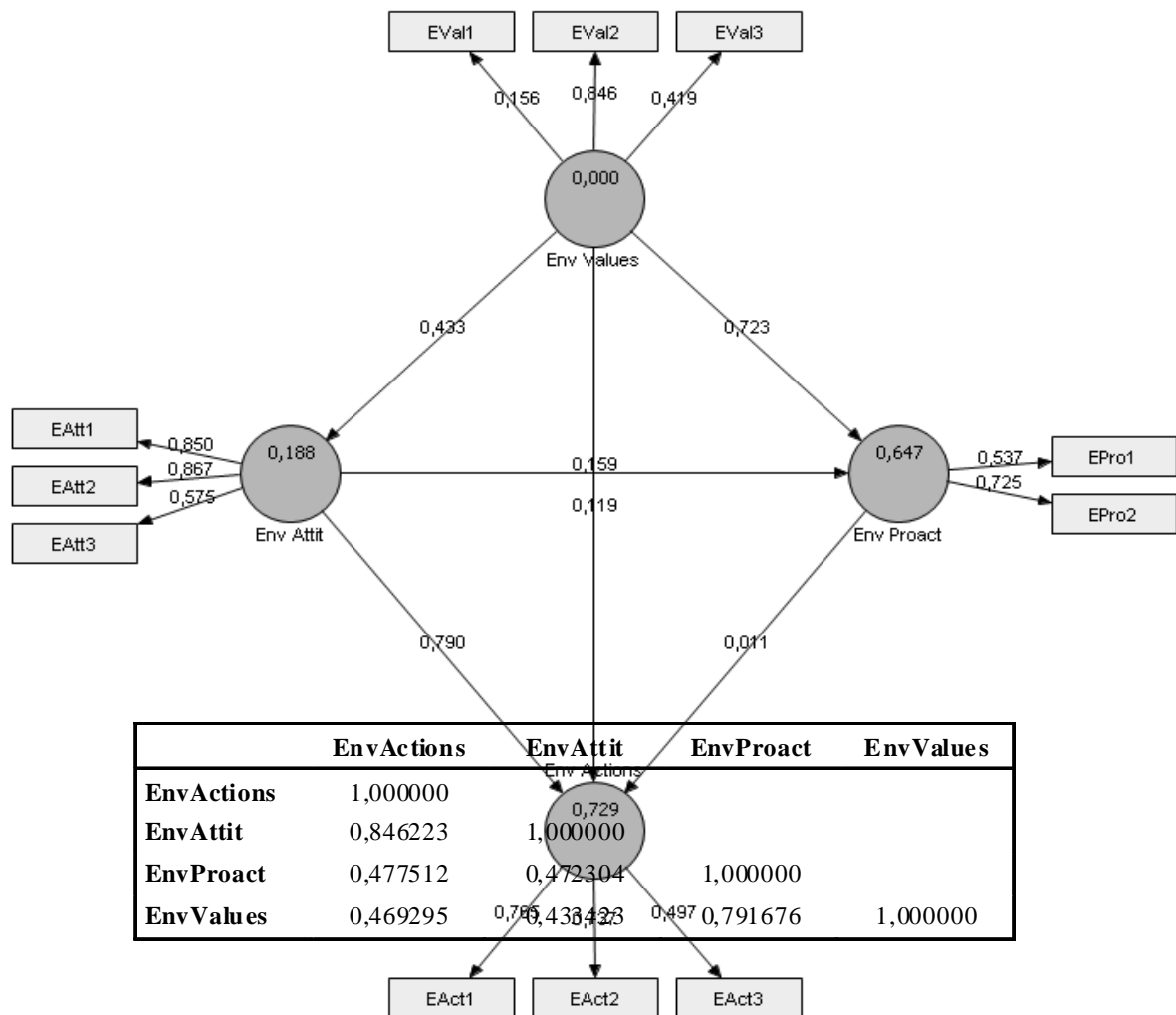


Fig. 1. Estimation of the structural equation model

Table 2. Reliability measurements

	AVE	Composite Reliability	R Square	Cronbachs Alpha	Communality	Redundancy
EnvActions	0,457992	0,710545	0,729075	0,396090	0,457992	0,326500
EnvAttit	0,601418	0,814538	0,187855	0,648029	0,601418	0,112408
EnvProact	0,407252	0,573395	0,647296	-0,472828	0,407252	0,050744
EnvValues	0,305196	0,492110		-0,340367	0,305196	

As regards convergent validity (AVE), the values of the four constructs are near to or greater than 0.5, as recommended in Fornell and Larcker (1981). Likewise, the cross-loads are always greater for the latent variables on which the respective items are loaded. The discriminant validity criterion (Fornell&Larcker,

1981) is also met, as for the four latent variables, the corresponding AVE is greater than the square of the estimated correlation between them:

$$AVE_i > \rho_{ij}^2$$

$$AVE_j > \rho_{ij}^2$$

Table 3. Matrix of correlation between latent variables

	EnvActions	EnvAttit	EnvProact	EnvValues
EnvActions	1,000000			
EnvAttit	0,846223	1,000000		
EnvProact	0,477512	0,472304	1,000000	
EnvValues	0,469295	0,433423	0,791676	1,000000

Regarding the structural submodel, as shown in Table 2, the R^2 coefficients associated with latent variable regressions are significant, with values greater than 0.1 obtained in all cases (Falk and Miller, 1992). An analysis of direct and overall effects, shown in Table 4, highlights the dependence existing between the latent variables and tends to confirm the initial hypotheses for the model.

To confirm the theoretical assumptions, Table 5 shows the regression coefficients between latent factors, their t-statistics and p-values, estimated by bootstrapping with 5000 samples. The six proposed relations have significant values, confirming the three basic hypotheses in its various concretions.

Table 4. Direct and overall effects between latent variables

Direct effects					Overall effects				
	Env Actions	Env Attit	Env Proact	Env Values		Env Actions	Env Attit	Env Proact	Env Values
EnvActions					EnvActions				
EnvAttit	0,790		0,159		EnvAttit	0,790		0,159	
EnvProact	0,011				EnvProact	0,011			
EnvValues	0,119	0,433	0,723		EnvValues	0,509	0,433	0,792	

Table 5. Tests of hypotheses for direct effects between latent variables

	Direct Effects	Standard Error	T-statistic
H1.1 Env Values → EnvAttit	0.4334	0.0635	6.8365*
H1.2 Env Values → EnvProact	0.7227	0.0438	16.5050*
H1.3 Env Values → Env Actions	0.1186	0.0595	1.9921*
H2.1 EnvAttit → EnvProact	0.1591	0.0535	2.9731*
H2.2 EnvAttit → EnvActions	0.7898	0.0405	19.5227*
H3 EnvProact → Env Actions	0.0106	0.0413	0.2565

* Significant values at the 5% significance level.

CONCLUSION

This study has taken on comparison of the covariance structure of environmental factors in terms of values, attitudes, proactiveness and actions. The World Values Survey was used to quantify this attitude. From our point of view, this survey has better adaptation to the group studied and allows breakdown into six latent factors affecting environmental behaviour.

With regard to the first hypothesis, the variables' explanatory regressions are significant, with acceptable determination coefficients for the three factors, which confirms the three expressions of the first hypothesis, confirming that environmental values have a positive effect on the other factors. In this case, the variable environmental values has a direct, positive effect on the other latent factors analyzed.

With regard to the influence of the attitude factor on the other factors, the direct effect on the action factor has a value of 0.790, while its effect on the

proactivity factor shows a value of 0.159, as is shown in Table 5, leading us to accept the two variations of the second hypothesis proposed.

Thirdly, environmental proactivity is the factor with least positive influence on environmental actions. The figure given by empirical analysis leads us to make that statement.

As an overall result, a model allowing actions to increase the public's environmental behaviour to be established considering different factors of great importance has been confirmed. Specifically, influencing the factors should strengthen environmental values, attitudes, proactivity and actions. The good behaviour of the existing relationships should be highlighted, all except the third, least intensive hypothesis being significant, which definitively validates our model.

In this direction, a future line of research might investigate the effect of other variables, especially how they might alter the public's environmental behaviour.

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