

Chapter 14

Measuring and Explaining Environmental Behaviour: The Case of Spain¹

Juan Díez-Nicolás

Spain ranks in position 76 out of 146 countries on the Environmental Sustainability Index (Esty, Levy, Srebotnjak, and de Sherbinin 2005), it ranks in position 19 out of 22 European Union countries included in the analysis (Luxembourg, Malta and Cyprus are not included), and it ranks in position 23 out of 29 OECD countries. The ESI-2005 index is based on 76 variables, from which only 21 indicators are constructed, which in turn are then grouped into 5 main components (environmental systems, reducing environmental stresses, reducing human vulnerability to environmental stresses, societal and institutional capacity to respond to environmental challenges, and global stewardship). Relatively speaking, Spain seems to score better in terms of reducing human vulnerability to environmental stresses and in societal and institutional capacity to respond to environmental challenges, but it scores worse in environmental systems, global stewardship and in reducing environmental stresses. The ESI report concludes that Spain suffers an overcharge of its ecological systems, though it shows a great capacity to face that problem with success. But it seems quite evident that Spain ranks lower than one would expect when considering measures of economic development (i.e., per capita GNP) or human development (i.e., HDI), where it ranks in position 25 and 20 respectively out of 177 countries (PNUD 2004).

Another international comparative research that measures environmental performance in 17 industrial democracies also shows very poor results for Spain (Scruggs 2003). The research focuses on the measurement and explanation of reducing environmental pollution since the early 1970s. Its results show that Ireland and Spain are the two countries (out of the 17 industrial democracies that are compared) with the lowest reduction in environmental pollution during the period 1970-1995. In this case, however, it must be taken into account that all other

¹ The data that provide the basis for discussing the Spanish case were the result of a research grant from the Obra Social Caja Madrid, and were first published in *El Dilema de la Supervivencia (The Survival Dilemma)*, (Díez-Nicolás 2004). The present paper, however, incorporates new ideas, arguments and data that are the result of many fruitful academic discussions with colleagues, including the workshop at International University Bremen.

sixteen countries would rank higher than Spain in terms of GNP per capita and in terms of HDI (except Italy). Scruggs differs from the authors of the ESI report in that he focuses on a selected number of countries (i.e., 17 industrial democracies), in that he focuses only on environmental performance (and more concretely, on the results in reducing environmental pollution), and in that he makes an effort to explain differences in environmental performance through different variables: structural variables (i.e., environmental policies, changes in per capita income, geographic size and density), individual variables (i.e., expressed social concern about environmental protection, post-materialist values), and institutional variables (i.e., economic and political institutions).

One of the most important contributions of Scruggs' research is his insistence on the difference between policies and outcomes, that is, between the intentions expressed by the government towards the environment and the actual results achieved in reducing pollution (performance). But this difference between attitudes and intentions towards the environment and actual environmental behaviour can also be detected at the individual level. In a previous attempt to compare seventeen countries with respect to their orientation towards the environment (Díez-Nicolás 1999) a distinction was made between knowledge, concern, attitudes, intentions to behave, and reported behaviour towards the environment, providing enough evidence to conclude that post-materialist values were positively correlated with knowledge, concern, attitudes, intentions to behave and reported environmentalist behaviour, though it was underlined that reported behaviour on behalf of the environment was very rare in most of the compared countries. On the other hand, it was also found that social position, an indicator that allows to differentiate between the social center (elites) and the social periphery (publics), was also positively related with all the environmental measures that have been mentioned, besides being highly correlated with post-materialist values, thus confirming Galtung's theory about the emergence and change of social attitudes (Galtung 1976). Post-materialist values and social position were also significantly correlated with membership in associations related to environmentalism, a finding that does not contradict Scruggs' finding that membership in environmental associations is not significantly correlated with better performance in reducing pollution in the countries he studied. The two findings actually seem to suggest that too frequently attitudes are taken as proxies of real behaviour, whereas the two often differ considerably.

As a matter of fact, a review of the literature shows that many authors tend to take knowledge about the environment, concern about the environment, attitudes towards the environment, or even intentions to behave towards the environment, as real measures of environmental behaviour. But this inference is questioned when one is confronted with the fact that, though post-materialist values are correlated with membership in environmental associations, membership in associations is not significantly correlated with good environmental performance as measured by reduction in pollution (Scruggs 2003). One hypothesis that seems to arise from these findings is that though attitudes may appear to be positively correlated with behaviour, they may also be a consequence of a desire to adapt to 'political correctness'. There is a large amount of literature on comparative analysis

concerning environmental knowledge, concerns, attitudes, mobilization, and intentions or expectations of behaviour (Skrentny 1993, Dunlap 1995, Ellis and Thompson 1997, Gilroy and Shapiro 1986, Rohrschneider 1990, Hofrichter and Reif 1990) but very few references to real behaviour or reported-recalled behaviour. And just as the policies formally adopted or announced by a particular government do not really tell us much about their implementation and results, likewise knowledge, concerns, attitudes and intentions to behave do not tell us much about what individuals' real environmental behaviour will be.

The Theoretical Framework

The most general hypothesis that will be tested in this paper is that attitudes precede behaviour, but they do not necessarily determine it. Attitudes, and indeed opinions (which are overtly expressed attitudes but not real attitudes) may be the result of personal reflection on acquired information about an object, but a person may also acquire them as part of the information itself, without reflecting personally about it (Katz 1953). That may be the reason why in the above-mentioned analysis of 17 countries (Díez-Nicolás 1999) it was found that attitudes (expressed opinions, including intentions to behave) towards the environment were much more frequent and positive than reported behaviour (even though it may be assumed that respondents probably overestimated their positive actions towards the environment). Nevertheless, in spite of a possible adaptation to what seems to be the 'politically correct' orientation, the fact that people feel and express the idea that they should behave properly towards the environment seems to be a result of what Durkheim called 'la contrainte social' (Durkheim 1893), the social pressure, which is not a random event, but a result of other social phenomena.

According to 'social ecosystem' theory (Duncan and Schnore 1959; Duncan 1964; Díez-Nicolás 1982; Hawley 1986), social attitudes are instrumental collective responses that a population develops in order to achieve the best adaptation possible to their environment, under a given state of the arts (technology). Human populations, as all other biotic populations, must interact with their environment and survive through the use of the resources that they find in it. But, contrary to all other biotic populations, human populations always interact with their environment through culture: a material culture (broadly defined as technology) and a non-material culture (broadly defined as social institutions, belief and value systems). Both of these form collective responses, which once established may facilitate or prevent further development, including technological development. The four elements of the ecosystem (i.e., population, environment, social organization and technology), therefore, interact with each other, each one of them being a dependent or an independent variable with respect to the other three, based on the analytical perspective that one adopts. The history of mankind may be very briefly described as a continuous process of change, because any equilibrium is by definition unstable, thus requiring constant new attempts to reach a stable balance among the four elements, a situation that is never attainable. The long-term historical development of human societies has implied growing population,

continuous expansion of the environment (mainly due to technological achievements in the fields of transportation and communication), ever-increasing complexity of technology, and ever-changing social institutions (i.e. economic, political, family, spatial, etc.) as well as belief and value systems (i.e. religions, ideologies, social movements, etc.).

If one accepts this very general theoretical framework, the conclusion is that 'culture matters', that attitudes and ideologies are both a result and a pre-requisite of certain other system conditions. The Protestant ethic may well have been a prerequisite for the historical emergence of capitalism (Weber 1905), and the achievement motivation (McClelland 1961) probably was a prerequisite for industrialization and economic development, but both social attitudes were also the result of previous social problematic conditions that required new social responses. Thus, the so called protestant ethic could be interpreted as a collective instrumental response to the need that emerged when capital investment in agriculture was producing very low returns and flourishing trades with the newly discovered worlds were yielding large capital gains that had to be reinvested in new and more productive activities different from agriculture. And the achievement motivation may be interpreted as a collective instrumental response to accelerate the economic recovery after World War Two, stimulating individuals to work more and with higher productivity by attaching more importance to individual merit than to family origins.

Similarly, one could argue that the diffusion of industrialization from the more developed countries (mainly North America, Europe, Japan and Australia) to the rest of the world produced better living conditions for the less developed regions but put also a huge pressure on the environment. This pressure was caused not only by the exponential increase in the intensive use of resources that derived from the exponential growth of population, but also by the fact that industrialization gave mankind, for the first time in its history, the power to destroy all kinds of life on earth. The increasing success of world industrialization at the end of the sixties and at the beginning of the seventies led human societies to become aware of the increasing importance of the environment, not only because of the economic limits of growth (Meadows et al. 1972), but also because of the social limits (Hirsch 1978) and the real threat to life on earth (Toffler 1975). Consequently, concern about the environment emerged as a collective response to avoid the threats of an intensive use of world resources that resulted from an unforeseen success in achieving world industrialization.

But the emergence of a new reality was not recognized by everybody everywhere at the same time. As 'centre-periphery' theory proposes, new attitudes and values are first developed at the centre of society and then spread towards the social periphery (Galtung 1964, 1976; van der Veer 1976; Díez-Nicolás 1966, 1968, 1995, 1996). Concern about the environment emerged at the end of the sixties in the more developed societies, and within them, among those individuals in higher social positions (the 'social centre' as defined by Galtung), that is, among better informed persons and those with more influence on public opinion. Inasmuch as concern for the environment was at that time a new social issue, it was only natural that it first became adopted by the elites that make the 'social centre' of the more 'central'

(developed) societies, as manifested in the growth of international and national new organizations (United Nations 1987, 2003; UNEP 1999) dealing with the environment, as well as in the growth of publications and new lines of research on environmental issues in all domains of science (natural and social).

Inglehart's theory of cultural change placed concern for the environment as one of the key indicators of the new post-materialistic orientation that replaced the value system underlying the industrialization process, that is, the new set of self-expression values that characterize post-modern and more developed societies, in contrast to the scarcity or survival values that characterized traditional and pre-industrial societies (Inglehart 1971, 1977, 1990, 1997; Inglehart et al. 2004). The relationship between post-materialist or self-expression values (which include concern for the environment) and environmental knowledge, attitudes and behaviour has been the object of comparative analysis of societies with very different levels of economic and political development (Bolten and Jagodzinsky 1985; van Deth 1983; Duch and Taylor 1993; Gendall et al. 1995; Skrentny 1993; Scruggs 2003).

The theoretical-logical relationship among the three theoretical frames discussed above has not gone unnoticed. In fact, in previous writings it was verified for a number of countries with very different levels of economic development, political organization and cultural values that knowledge about the environment, concern for the environment, preference for protecting the environment over economic development, and intentions to act in favour of the environment, are generally more prevalent in more developed ('central') societies, more prevalent in every society among individuals with higher social positions ('social centre'), and more prevalent in every society among individuals who show a more post-materialist orientation (Díez-Nicolás 1992, 1995, 1999, 2000). But one relationship lacked verification, mainly because measurement instruments used on the surveys from which data were obtained were not appropriate for that purpose: the relationship between attitudes towards the environment and environmental behaviour. This is the main purpose for using Spain as a case study for testing a model that focuses on environmental behaviour as the main dependent variable, and for including attitudes towards the environment, concern and knowledge about the environment, social position, and other relevant variables, as independent explanatory variables. The choice of Spain is especially relevant because, as was mentioned above, it is a country in which environmental policies established by the government do not seem to be implemented, a country that shows a low Environmental Sustainability Index relative to other measures of economic development and ranks among the lowest in terms of reducing environmental pollution (Esty et al. 2005; Scruggs 2003).

The Measurement of Environmental Behaviour

The theoretical model used to explain environmental behaviour in Spain consists of a path analysis model in which the dependent variable is a compound index of environmental behaviour, and the six independent variables are all the product of a

combination of items included in a questionnaire applied to a representative sample of 1,224 residents in Spain, 18 years old and over, through face-to-face interviews in their homes. The sample design starts with the proportional distribution of interviews among the 17 regions according to their population and to community size within each region. Municipalities with more than 500,000 inhabitants are of compulsory selection; the rest come out of a random draw. Once the number of interviews has been established (by size of municipality and region), municipalities are randomly extracted through a computerized system. Electoral sections, generally around 155, are also randomly selected within each municipality. A random route system is applied for household selection within each electoral section. Age and sex quotas within each random route (established for each electoral section on the basis of its census distribution by size of community within each region) are used for selecting the respondent within each household.

The six independent variables, ordered from the most antecedent variable to the last in the path analysis model are the following: social position, environmental information, knowledge about the environment, post-materialism, environmental orientation, and confidence in civil society.

According to the theoretical framework presented above, one would expect to find a positive relationship between social position and post-materialism, on the one hand, and good practices of environmental behaviour on the other hand. These are the two major hypotheses to be tested in the model. But some other hypotheses are also derived from theory. Thus, according to 'centre-periphery' theory, the social centre is more informed and has more knowledge and opinions than the social periphery about any issue, and therefore one would expect to find positive relationships between social position and information on the environment, between social position and knowledge about the environment, between social position and post-materialism (based on the assumption that the social centre internalizes new values earlier than the social periphery), and between social position and an environmental orientation (attitudes more favourable to protecting the environment than to economic development). There is no theoretical reason to expect, however, any particular relationship, positive or negative, between social position and confidence in civil society.

Regarding information on the environment, and always according to the theoretical assumptions presented above, one would expect to find that individuals who are more informed about the environment should have more knowledge about it, should be more post-materialist oriented, should be more favourable to protecting the environment, and should also have better practices towards the environment. Again, however, there is no reason to expect any particular relationship between information on the environment and confidence in civil society, though one might expect that individuals who are better informed about the environment are also more informed about other issues, due to a higher level of education, which would lead them to trust civil society more than public administrations (Putnam 1993). Following similar arguments, knowledge about the environment should be positively related to post-materialism, to favourable attitudes concerning the protection of the environment, and to good practices of environmental behaviour, but one should not expect any kind of relationship with confidence in civil society. Finally, attitudes

towards the environment and confidence in civil society should be positively related to good practices of environmental behaviour.

The construction of indexes to measure each variable in the model has followed the following steps. First, the social position index is based on seven socio-demographic variables. The index of social position has been constructed through an adaptation of Galtung's index, and modifying previous adaptations to Spain of that index made by the author (Díez-Nicolás 1968), avoiding dichotomization of variables and giving different (rather than equal) weights to the component variables. The values attached to categories in each variable are the following. Sex (male = 1; female = 0). Age (<18 and >75 = 0; 18-25 and 65-74 = 1; 26-35 and 55-64 = 2; and 36-54 = 3). Educational level (less than primary and missing = 0; primary, elementary, secondary first cycle, vocational = 1; secondary second cycle, pre-university = 2; university degree = 3). Monthly income (<450 € = 0; 451-900 € = 1; 901-1,650 € = 2; >1,650 € = 3). Size of habitat (<10,000 inhabitants = 0; 10,000-50,000 = 1; 50,000-250,000 = 2; 250,000 plus Madrid and Barcelona = 3). Occupational status (no occupation plus missing = 0; non qualified = 1; qualified and middle status occupations = 2; high status occupations = 3). Economic sector (no occupation plus missing = 0; primary, extractive sector = 1; secondary, industrial sector = 2; tertiary, service sector = 3). Centrality (regions with low per capita income [Castilla-La Mancha, Galicia, Andalucía, Extremadura] = 0; regions with middle per capita income [La Rioja, Aragón, Cantabria, Valencia, Castilla-León, Canarias, Asturias, Murcia] = 1; regions with high per capita income [Madrid, Navarra, País Vasco, Baleares, Cataluña] = 2). The social position index could therefore vary between 0 and 27 points. The correlation coefficient between the index of social position and the more common index of socio-economic status is $r=.50$, but the former has shown greater predictive value than SES (Díez-Nicolás 1992, 2004).

Social position is positively and significantly correlated at .01 level with the eight component socio-demographic variables, as expected, but the correlation coefficients are especially high with occupation, education, economic sector and income, and lower with sex and age, as was intended when deciding to give more weight to occupation, income and education. As to the distribution of the index, it shows a bell-shaped curve with about 10 percent of respondents in high social positions (21 points or more), but only 3 percent in what Galtung would call 'the decision-making nucleus' (24 points or more). At the other end of the scale, about a quarter of the sample qualifies as 'social periphery' (10 points or less), and about 5 percent could even be considered 'extreme social periphery' (5 points or less).

Information about the environment was measured through the number of sources that individuals said they used to obtain information on the subject. In fact, three measures of exposure to information are considered: one is a 'general index of exposure of information' which takes into account newspaper readership, listening to information programmes from general broadcasts, watching TV news programmes; a second index is based on the respondents' evaluation as to how well informed about environmental issues they feel; and the third index is based on the number of sources that respondents said they used to obtain environmental information. It was found that 15 percent of the sample shows a high index of

exposure to general information (every day they read one newspaper, listen to a radio news programme and watch a TV news programme), and 29 percent answers they feel very or rather well informed about environmental issues. However, 29 percent of respondents admits that they do not use any of the thirteen sources of information on environmental issues that were mentioned to them, and only 3 percent that they use five or more of those sources to obtain information on the environment. The thirteen sources of information on environmental issues that were presented to respondents were: newspapers, radio, TV, ecological associations, other scientific associations, internet, studies or professional training, public lectures or courses, professional activity, voluntary work, friends, specialized magazines, and other sources. A main component analysis showed four different factors: one that included the three media sources, a second one that included the two sources about associations, a third one that included the three sources on study and profession, and a fourth one that included only voluntary work. The other three sources (friends, specialized magazines and others) did not fit into any of the four factors or any other factor. TV was undoubtedly the most cited source of information on the environment. A regression model in which exposure to environmental information was the dependent variable and social position, post-materialism and general exposure to information were included as independent variables explained 17 percent of the variance, and though the three variables showed significant standardized regression coefficients, social position seemed to contribute more than the other two to that explanation. Besides, the three indicators of information on the environment are significantly correlated: general information and self-evaluation ($r=.19$), general information and exposure to information on the environment ($r=.25$), and self-evaluation and exposure to information on the environment ($r=.61$).

Environmental culture has been measured through eight items, but a principal component analysis showed that there are two components, one that measures scientific knowledge about the environment (five items), and another one that measures concern about the environment (three items). Statistical analysis demonstrated that only scientific knowledge about the environment was really relevant, though the correlation between the two indicators was $r=.47$. Scientific knowledge has been measured by giving the correct answers to four statements on the environment: 'If someone is exposed to a certain amount of radioactivity, no matter how small, he/she will certainly die'; 'all pesticides and chemicals used on food crops cause cancer in human beings'; 'some radioactive residues produced by nuclear plants will remain dangerous for thousands of years'; 'every time that coal or oil are used the [green house] effect is worsened'; and 'cellular phone antennas are dangerous for the health of individuals'. Since for each item the respondent could answer 'totally true, probably true, probably false, or totally false', the resulting scale could vary from five totally correct answers (20 points) to five totally incorrect answers (0 points).

Exposure to environmental information shows a greater relationship with scientific knowledge about the environment than with concern about the environment. On the other hand, the items that measure knowledge had all been tested successfully in many other surveys, while the items that measure concern

were new and had not been tested before. And, finally, the items that measure concern seem to produce answers very much in line with 'political correctness'. For all these reasons, it was decided to measure this variable only through the scientific knowledge items. It must be underlined that only around 15 percent of the respondents seems to be really knowledgeable about the environment (obtaining 16 points or more), while about the same proportion seems to have a very low knowledge about the environment (obtaining 9 points or less). A regression model to explain knowledge about the environment using social position, post-materialism and exposure to information on environment explains 19 percent of the total variance, and though the three predictors contribute significantly to that explanation, exposure to information seems to contribute less than the other two variables because of its high intercorrelations with them.

Post-materialism has been measured using Inglehart's scale of twelve items. The twelve items were divided into two groups, a first group of four items, two measuring materialist values ('maintaining order in the nation' and 'fighting rising prices') and two measuring post-materialist values ('giving people more say in important government decisions' and 'protecting freedom of speech'), and a second group of eight items, four measuring materialist values ('a high level of economic growth', 'making sure this country has strong defence forces', 'a stable economy', and 'the fight against crime') and four measuring post-materialist values ('seeing that people have more say about how things are done at their jobs and in their communities', 'trying to make our cities and countryside more beautiful', 'progress toward a less impersonal and more humane society', and 'progress toward a society in which ideas count more than money'). Since respondents could choose two items from the first group of four items, and three from the second group of eight items, they could select in total a maximum of 5 and a minimum of 0 post-materialist items. This is an extensively tested scale, regardless of whether one uses only a scale of four items, a scale of four and another one of eight items, or three scales of four items each. Social position and post-materialism are certainly positive and significantly correlated ($r=.16$), as expected, but it must be underlined that their relationship is far from perfect, a finding that supports the decision to include the two indexes as separate independent variables to explain good practices of environmental behaviour. A regression model to explain post-materialism through social position, exposure to environmental information and scientific knowledge on the environment explains 10 percent of the variance, but social position does not add significantly to that explanation in the presence of the other two predictors, information and knowledge on the environment, which contribute more or less the same.

Pro-environmental orientation has been measured through nine items, some of them more favourable to economic development and others more favourable to protecting the environment. To construct the index, a principal component analysis was made with the nine items that measure preferences towards the environment or economic development, and only one factor was extracted, so that they scaled themselves with the most pro-environment at one end and the most pro-development at the other end. Then, the two most pro-environment items ('to protect the environment it is necessary to reduce our consumption and standard of

living'; 'the protection of the environment requires more solidarity with the less developed countries'), and the two more pro-development items ('people have the right to use all the artefacts that technology provides, even if when using them we unintentionally deteriorate the environment'; 'it is right to use animals in medical experiments if it helps to save human lives') were selected to construct an index. Since respondents had to agree or disagree with each item on a four point scale, the index varies between 4 (completely disagree with the two pro-environment items and completely agree with the two pro-development items) and 16 (exactly the reverse). The nine items were scaled on a bipolar axis through a principal component analysis with only one extracted factor. The distribution of respondents on a 4 to 16 point scale was again a bell-shaped curve skewed towards the environmentalism pole, with almost 10 percent of respondents on the three more pro-environmental positions, and only less than 1 percent on the three more pro-development positions. The regression model calculated to explain the pro-environmental orientation through the previous four variables (social position, exposure to environmental information, knowledge about the environment and post-materialism) explains only 6 percent of the total variance, and only social position and post-materialism show significant contributions to explaining that variance.

Finally, confidence in civil society has been measured on the basis of four questions that attempted to assess the degree of confidence that respondents had in different civil institutions (educational, mass media and business and industrial firms) regarding the protection of the environment. The index of 'confidence in civil society' was built on the basis of four questions: confidence on the school education that the respondent received concerning the protection and maintenance of the environment; opinion on whether the information on the environment provided by the press, broadcasting stations, and TV channels is sufficient or insufficient; opinion on whether or not business and industrial firms take into account environmental criteria in their processes of production and manufacturing; and opinion on whether or not business and industrial firms give at present more or less information on the ingredients and components of their products or over their impact on the environment.

The scale varies between 7 and 29 points, but one third of respondents did not give an answer to any of the four questions. A regression model constructed to explain confidence in civil society shows that only 4 percent of its variance is explained by the five previous variables, though only exposure to environmental information and attitudes towards the environment contribute significantly to that explanation. It must be underlined, however, that ideology (measured on a self-positioning scale of seven points) is very significantly related to confidence in civil society ($r=.20$), suggesting that individuals who place themselves on the right tend to have greater confidence in civil society than those who place themselves on the left (a finding that is coherent with the complementary finding that individuals who place themselves on the left tend to rely more on public administration than on civil society).

But the major goals of this paper were to measure environmental behaviour and to explain why some individuals show better practices of behaviour towards the environment. Several approaches have been tested to measure behaviour

towards the environment because behaviour as such cannot be measured through surveys, but only reported behaviour or intentions to behave. First, respondents were asked for the frequency with which they practiced a total of twenty-three common activities that may have an impact on the environment. The list of activities was: driving a car, driving a motorcycle, driving a work vehicle (bus, truck, tractor, etc.), double parking, smoking at home or in open spaces, throwing trash in the streets, separating garbage in different bags, using sprays, throwing cigarettes or trash to the floor in bars or cafes, depositing newspapers and other papers in containers, leaving garbage bags and other rubbish (bottles, cans, etc.) in the countryside or in beaches after a picnic, throwing cigarettes or trash out of the car's window, lighting a fire in the fields or woods, smoking at work, bars or restaurants, or in any other indoor space, opening a tap and letting the water run unnecessarily, throwing away batteries with the regular garbage, leaving lights on in rooms where there is nobody, buying products using the least possible amount of wrapping, throwing bread or other food products into the garbage bag because of expired date, using public transportation for daily activities instead of private car, buying recycled paper or products, depositing bottles in the appropriate containers, burying cigarettes butts in the sand at the beach, and other activities. The most frequently practised activities are driving a car (86 percent), smoking at home or in open spaces, throwing papers and other rubbish in the street, smoking at work, in bars, restaurants and other indoors public places, and throwing cigarettes and/or trash to the floor in bars and cafes (between 65 percent and 61 percent). The twenty-three activities were then classified as good or bad practices towards the environment (seven of them were classified as good and sixteen as bad practices), and an index showing the difference between good and bad practices for each individual was constructed. The classification of these practices as good or bad was confirmed through a principal components analysis extracting only one factor. For each individual only those activities that were practised sometimes or usually were taken into account. The index could vary between -16 and +7, but 100 were added to the result to avoid negative values, so that the scale could vary between 84 and 107 points.

A second index was calculated taking into account the frequency of practising each activity (i.e., giving different weights according to frequency of practice) and the degree of damage to the environment that individuals attributed to each activity. For the seven 'good' practices 3 points were given if they were practiced usually, 2 points if sometimes, and 0 points if never. 'Bad' practices were separated into two groups, one including the eight that were considered as more damaging to the environment by respondents, and a second group including the other eight activities. For the activities in the first group 0 points were given to those who said they practiced them usually, 1 point if practiced sometimes, and 3 points if never practiced. For the activities in the second group 0 points were given if practised usually, 1 point if practised sometimes, and 2 points if never practised. This index could vary between 0 and 61 points.

A third index based on the same data was built, taking into account only the seven 'good practices'. This index was very simple, as it only took account of whether or not each of the seven 'good' activities was ever practised by the

respondent, so that the values could vary between 0 and 7. Only 9 percent of respondents said they had practised all seven good practices, while 5 percent had practised none.

Another approach to measuring good behaviour towards the environment referred to reported changes in a consumer's behaviour. The questions, in this case, asked whether or not respondents had changed their habits of water, gas or electricity consumption, and their buying habits, in order to save energy or to take into account environmental protection criteria. In every case, if the answer was positive (i.e., R had changed habits to save energy or to protect the environment) 3 points were given; two points were given if the answer was 'no, because I use only what is necessary' or 'no, because I changed my habits before'; and one point was given if the answer was 'no, I did not change them because I don't care about those things'. The index could vary between 4 and 12 points, but 17 percent of respondents did not answer these questions, and only 9 percent had changed the four habits in order to save energy or protect the environment.

Consumer behaviour has also been measured through some other questions that have been used to elaborate another index. In this case five different consumption habits were taken into account: looking at expiration date of food products, buying household appliances of low energy consumption, buying house cleaning products that are not aggressive to the environment, buying recycled products, and buying fruit and vegetables non-exposed to pesticides or chemical products. Since the frequency for each one of the five consumption habits was available, 2 points were given to those habits that were followed always or almost always, 1 point if followed sometimes, and 0 points if followed never or almost never. The index could vary between 0 and 10 points, and 15 percent of respondents did not answer the questions, but while 8 percent obtained 3 points or less (on a scale 0 to 14), 14 percent obtained 7 or more points.

One affirmative action index has been constructed through four items that asked about participation in political activities in favour of the environment: membership in some group or association engaged in protecting the environment, signing some collective letter within the last 5 years for some environmental cause, giving money to some environmental group, or participating in some protest or public demonstration on some environmental issue. Each individual received one point for each activity in which he had ever engaged, so that the index could vary between 0 and 4 points. It must be underlined that more than 80 percent of respondents had never done any of the four activities, while only 13 persons had done all four. This finding by itself is a clear demonstration of the great gap between attitudes and behaviour, and why it is so important to measure behaviour, even at the risk of overestimating good behaviour due to the fact that it is necessary to rely on the respondent's answers.

The last index was intended to measure 'disposition' to behave in favour of the environment. Only two items were used to construct this index: one asked if R would be in favour or against paying more taxes or accepting a decrease in their present standard of living in order to protect the environment. The scale for each item was one of five categories: 'very much in favour', 'somewhat in favour', 'nor in favour neither against', 'somewhat against' and 'very much against',

giving from 5 to 1, and 0 for no answer. The scale could vary from 0 to 10. The correlation coefficient between the two items was $r=.60$ and statistically significant.

It is interesting to note that, in contrast with the little action measured by the answers regarding real behaviour (which probably were somewhat exaggerated), when the questions refer to 'intentions' to behave individuals seem to be much more ready to act. In fact, 26 percent of the respondents say that they would accept paying more taxes if they were applied to protect the environment, and 36 percent would accept lowering their standard of living in order to protect the environment. The contrast between future expectations and past actions is remarkable, and certainly warns against using 'intentions' to behave as good predictors.

To summarize, seven indexes of environmental behaviour have been constructed. Using regression models with the model independent variables and each index as the dependent variable, the corrected explained variance varies between 14 percent and 26 percent for six indexes, but only 2 percent with respect to the index measuring change of consumption habits. In most models social position and post-materialism are the variables with the highest standardized regression coefficients. But it must be admitted that using seven indexes as the dependent variable does not clarify the measurement of environmental behaviour. Therefore, and in view of the knowledge gained through the very detailed analysis that was performed, a summary index for measuring environmental behaviour was constructed. This index has been based on all the items that imply good practices towards the environment, giving one point for each. The items are the following: separating garbage in different bags, depositing newspapers and other papers in appropriate containers, buying products with the least possible amount of wrapping, placing in the trash bread or other food products whose expiration date has passed, using public transportation for daily activities instead of private car, buying recycled paper or other recycled products, and depositing bottles in appropriate containers. One point was also given for reducing the use of water, gas and electricity and for modifying consumption habits to care for the environment. One point was given for doing always or almost always the following: looking at the expiration date of food products, buying ecological food products grown naturally, buying house cleaning products that are not aggressive towards the environment, buying recycled products, buying products with the 'ecological label', buying household appliances with low energy consumption, buying fruits and vegetables grown without pesticides or chemical products, and giving up driving the car for environmental reasons. One point was also given for being a member of a group or association engaged in protecting the environment, having signed some collective letter about some environmental issue, having given money to some environmental group, or having participated in some protest group or public demonstration for some environmental cause. The total number of good practices is twenty-three, so that the index could vary between 0 and 23.

The global 'index of good environmental practices' can vary between 0 and 23 points, and it may be seen that only less than 5 percent of respondents obtain 13 or more points, while 55 percent obtain 5 or less points. It is quite evident that, on the basis of such a variety of possible good practices towards the environment, the great majority of Spaniards obtain a very low score. And it must be emphasized

that bad practices (which, as has been demonstrated, are quite frequent) have not been included in this index, and neither have intentions to behave, since the answers seem to be rather exaggerated.

To test the validity and reliability of this global 'index of good environmental practices', a correlation matrix of the previous seven indexes and the new global index has been calculated. The main conclusion that can be derived from this correlation matrix is that the global 'index of good environmental practices' shows the strongest correlation coefficients with all other indexes, a finding that seems to guarantee its utility to measure good environmental behaviour, and that consequently fulfils one of the main goals of this chapter.

Table 14.1 Correlation coefficients (Pearson's r) among the different indexes of environmental behaviour*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Global index of good environmental practices	-							
(2) Difference between positive and negative behaviours	.26	-						
(3) Behaviour scaling and frequency of practice	.35	.97	-					
(4) Favourable behaviours (positive, good practices only)	.44	.44	.51	-				
(5) Change in consumption habits	.53	.12	.14	.14	-			
(6) Ecological behaviours	.55	.10	.16	.26	.17	-		
(7) Participation in activities of affirmative action	.47	(.05)	(.06)	.21	.11	.25	-	
(8) Intentions to behave in favour of the environment	.28	(.07)	.09	.20	.17	.18	.22	-

* All coefficients are significant at .01 level except those between brackets.

The Explanation of Environmental Behaviour

A path analysis model has been constructed to explain behaviour towards the environment. The dependent variable is the 'global index of good environmental practices' as defined above. The most antecedent independent variable is social position, and the intervening variables are exposure to environmental information, scientific knowledge about the environment, post-materialist values, pro-environment orientation, and confidence in civil society.

Table 14.2 Correlation coefficients (Pearson's r) among the different independent variables and the global index of good environmental practices*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Global Index of good environmental practices	-						
(2) Social position	.26	-					
(3) Post-materialism	.26	.16	-				
(4) Exposure to information on the environment	.29	.34	.24	-			
(5) Scientific knowledge about the environment	.22	.26	.26	.25	-		
(6) Environmental orientation	.14	.11	.24	(.04)	(.03)	-	
(7) Confidence on civil society	.14	(-.00)	(-.04)	.12	(.03)	-.16	-

* All coefficients are significant at .01 level except those between brackets.

All independent variables are positively and significantly correlated with the global index of good environmental practices, and most of the correlations among the independent variables are also positive and significant, but two of the variables (environmental orientation and confidence on civil society) do not show strong relationships with the other variables, including the global index of good environmental practices. Most interesting is that exposure to information on the environment and scientific knowledge concerning the environment are not significantly correlated with attitudes toward the environment. However, post-materialism shows the strongest relationship with it. Besides, confidence in civil society is not related to social position or to post-materialist values, neither to knowledge about the environment, but individuals who are more exposed to environmental information have greater confidence in civil society. And those who are more in favour of economic development than of protecting the environment have less confidence in civil society. The reason, as explained above, is that individuals who politically place themselves on the left are more favourable to the public sector than to civil society, but more favourable to the environment than to economic development, while those who place themselves on the right trust civil society more than they trust the public sector, and they are more favourable to economic development than to protecting the environment. Ideology, however, was not included into the path analysis model as an intervening explanatory variable because it is not significantly related at all to behaviour towards the environment.

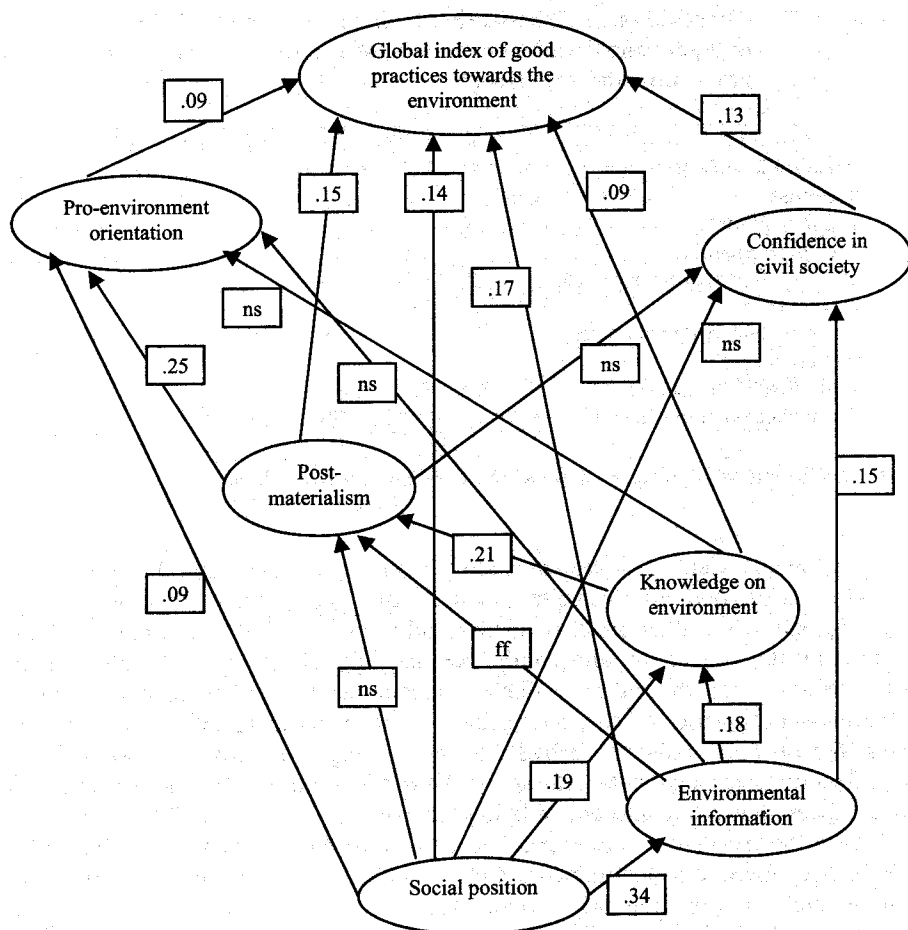


Figure 14.1 Standardized direct effects of each one of the explanatory variables in the model on all other variables

The standardized direct effects of each variable on all others, following the path established in the model, confirms some hypotheses that have been repeatedly verified by research. Thus, the 'social centre' is more informed and has more knowledge about everything (in this case about the environment) than the 'social periphery'. The social centre shows better environmental behaviour than the social periphery, thus confirming also that the social centre internalizes new values (good practices towards the environment) earlier than the social periphery (Galtung 1964; Díez-Nicolás 1968). But social position has no direct effect on confidence in civil society nor on post-materialist values (an apparently surprising finding that will be explained later, because these values are new, and therefore should be internalized

earlier by the social centre than by the social periphery), and a very weak though significant direct effect on attitudes in favour of the environment. Post-materialism, which is the other major explanatory variable according to the theoretical framework, shows significant direct effects on preference for the environment over economic development, confirming Inglehart's assumptions and findings (Inglehart 1977, 1990), and also on environmental behaviour, suggesting that values have an impact on behaviour but no direct effects on confidence on civil society. The model also confirms that exposure to information and knowledge about the environment have no direct effects on preferences for protecting the environment over economic development, suggesting that attitudes may be a consequence of adaptation to what seems 'politically correct'.

Table 14.3 Effects of explanatory variables on good practices towards the environment*

	Non-standardized effects		
	Direct +	Indirect =	Total
Social position	.11	.08	.19
Exposure to environmental information	.45	.18	.63
Scientific knowledge on the environment	.09	.03	.13
Post-materialist values	.45	.04	.50
Confidence in civil society	.17	--	.17
Attitudes favourable to environment	.17	--	.17
	Standardized effects		
	Direct +	Indirect =	Total
Social position	.14	.11	.26
Exposure to environmental information	.17	.07	.23
Scientific knowledge on the environment	.09	.03	.12
Post-materialist values	.15	.01	.16
Confidence in civil society	.13	.00	.13
Attitudes favourable to environment	.09	.00	.09

* All coefficients are significant at .05 level.

Furthermore, the six explanatory variables in the model have a direct and statistically significant relationship to the dependent variable, though knowledge about the environment and preference for the environment over economic development have weaker though significant relationships to it. This means that individuals who belong to the social centre, who have a post-materialist value orientation, who are more exposed to information on the environment, who have more knowledge about the environment, who attach more importance to protecting the environment than to economic development, and who show more confidence on civil society to protect the environment, tend to behave in a more favourable

manner towards the environment than their respective counterparts. The model explains 18 percent of the total variance on the good practices towards the environment, an important proportion when one considers the complexity of the model and, in particular, the complexity of the dependent variable itself.

Table 14.4 Standardized effects of explanatory variables among themselves*

	Social Position	Exposure to information	Knowledge on environment	Post- materialism	Confidence in civil society	Attitudes towards environment
	Direct effects					
Exposure to information	.34*					
Scientific knowledge	.19*	.18*				
Post- materialism	.05	.18*	.21*			
Confidence in civil society	-.04	.15*		-.06		
Environmental attitudes	.09*	-.03	-.02	.25*		
	Indirect effects					
Exposure to information	-					
Scientific knowledge	.06					
Post- materialism	.11	.04				
Confidence in civil society	.04	-.01	-.01			
Environmental attitudes	.02	.05	.05			
	Total effects					
Exposure to information	.34					
Scientific knowledge	.26	.18				
Post- materialism	.16	.21	.21			
Confidence in civil society	-.00	.13	-.01	-.06		
Environmental attitudes	.12	.02	.03	.25		

* These coefficients are significant at .05 level.

Undoubtedly, one of the most important findings is that attitudes towards the environment do not seem to be a consequence of being informed or having knowledge about the environment. But this is not the only realm of social life where attitudes are accepted without the necessary reflection. Mass media have made possible a massive transmission of values, attitudes and opinions that are accepted without critical reflection by large sectors of the population and which do not respond to deep convictions, but to a predisposition and desire to adapt to what is taken as the majority opinion or as the more socially acceptable.

Another important finding is the lack of significant and direct effects of social position on post-materialism. The significance level required for an error of ± 5 percent is > 1.96 . Standardized direct effects of social position on post-materialism, as well as that of social position on confidence in civil society, are very close to this level but do not achieve it.

But it must be noted that though the direct effects of social position on post-materialism are small (but positive), the indirect effects (through exposure to information and scientific knowledge about the environment) are very strong and positive. This means that not all individuals in the social centre adopt post-materialist values, but only those who, in addition, receive more information and have more knowledge about the environment. It is also important to underline that the greater explanatory power of social position with respect to post-materialist values is not new (Díez-Nicolás 1999), and this seems to result from the explanation advanced when discussing the theoretical framework, and more concretely when discussing the social-ecosystem and the centre-periphery theories. The confirmation of a primacy of social position over post-materialist values in explaining behaviour towards the environment should not be interpreted as a rejection of Inglehart's theory, but only as a specification of it that results from the assumption that attitudes (and more so behaviours) towards the environment are changing not only because of the modernization and post-modernization processes analyzed by Inglehart, but also because the social centre has become conscious of the real threat created by mankind to the survival of life on earth. For this same reason, it seems plausible that attitudes favourable to protecting the environment are being transferred from the social centre to the social periphery with greater intensity and speed than behaviours, since the people in the social periphery try to adapt their opinions (probably not as much as their real attitudes) to what they accept as 'politically correct', but without really internalizing these attitudes, and therefore, without this adaptation implying an effective translation of attitudes into behaviours towards the environment. It cannot be overlooked that, while 32 percent of respondents declare their readiness to lower their lifestyle significantly in order to protect the environment better, only 5 percent declare having contributed money to some ecological or environmental organization or group. The contradiction between attitudes and behaviours that these results show is not new, but common to other surveys conducted in Spain and other countries (Díez-Nicolás 1999). The contradiction does not result necessarily from a deliberate intention to lie, but from a process that is taking place in many societies, whereby attitudes are being transferred earlier and quicker than behaviours from the social centre to the social periphery, a process which is normal with respect to many other social

changes. In other words, the majority of Spaniards, and probably of other nationals, really believe that they 'should' give priority to protecting the environment over economic development, but their real behaviours and value orientations continue to give greater priority to economic development.

References

- Boltken, F. and W. Jagodzinsky (1985), 'In an environment of insecurity: postmaterialism in the European Community, 1970 to 1980', *Comparative Political Studies*, 17.
- van Deth, J.W. (1983), 'The persistence of materialist and postmaterialist value orientations', *European Journal of Political Science*, 9.
- Díez Nicolás, J. (1966b), 'Posición social y opinión pública' (Social position and public opinion), *Anales de Sociología*, 2: 63-75.
- Díez Nicolás, J. (1968), 'Social position and attitudes towards domestic issues in Spain', *Polls*, III, 2: 1-15.
- Díez Nicolás, J. (1982), 'Ecología humana y ecosistema social' (Human ecology and the social ecosystem), in CEOTMA, *Sociología y Medio Ambiente* (Sociology and Environment). MOPU, Madrid.
- Díez Nicolás, J. (1992), 'Posición social, información y postmaterialismo', *Revista Española de Investigaciones Sociológicas*, 57: 21-35. (Trad. al inglés (1996): 'Social position, information and postmaterialism', *REIS*, English edition: 153-165.)
- Díez Nicolás, J. (1995), 'Postmaterialism and the social ecosystem', in Beat and Beatrix Sitter Liver (eds.), *Culture Within Nature*. UNESCO, Paris.
- Díez Nicolás, J. (1999), 'Industrialization and concern for the environment', in N. Tos, P.Ph. Moler y B. Malnar (eds.), *Modern Society and Values*. FSS y Mannheim, ZUMA, Ljubljana.
- Díez Nicolás, J. (2000), 'La Escala de postmaterialismo como medida del cambio de valores en las sociedades contemporáneas' (The scale of postmaterialism as a measure of value change in contemporary societies), in F. Andrés Orizo and J. Elzo, *España 2000, entre el Localismo y la Globalidad. La Encuesta Europea de Valores en su Tercera Aplicación, 1981-1999*. (Spain 2000, between localism and globality. The European Values Survey in its Third Application, 1981-1999.) Editorial Santa María, Madrid.
- Díez Nicolás, J. (2004), *El Dilema de la Supervivencia (The Dilemma of Survival)*. Obra Social Caja Madrid, Madrid.
- Duch, R.M. and M.A. Taylor (1993), 'Postmaterialism and the economic condition', *American Journal of Political Science*, 37.
- Duncan, O.D. (1964), 'Social organization and the ecosystem', in: R.E.L. Faris (ed.), *Handbook of Modern Sociology*. Rand Mc Nally and Co, Chicago.
- Duncan, O.D. and Schnore, F. (1959), 'Cultural, behavioral and ecological perspectives in the study of social organization', *The American Journal of Sociology*, LXV: 132-153.
- Dunlap, R. (1995), 'Public Opinion and Environmental Policy', in J. Lester (ed.), *Environmental Politics and Policies*, 63-113. Durham, Duke University Press, NC.
- Durkheim, E. (1893), *De la Division du Travail Social*. Alcan, Paris.
- Ellis, R.J. and F. Thompson (1997), 'Culture and the Environment in the Pacific Northwest', *American Political Science Review*, 91: 885-98.
- Esty, D.C., M. Levy, T. Srebotnjak and A. de Sherbinin (2005), *2005 Environmental Sustainability Index: Benchmarking National Environmental Stewardship*. Yale Center for Environmental Law and Policy, New Haven.

- Galtung, J. (1964), 'Foreign policy opinion as a function of social position', *Journal of Peace Research*, 34: 206-231.
- Galtung, J. (1976), 'Social position and the image of the future', in H. Ornauer and others (eds.), *Images of the World in the Year 2000*. Mouton, Paris.
- Gendall, P., Smith, T.W. and Russell, D. (1995), 'Knowledge of scientific and environmental facts: A comparison of six countries', *Marketing Bulletin*, 6: 65-74.
- Gilroy, J. and R. Shapiro (1986), 'The Polls: Environmental Protection', *Public Opinion Quarterly*, 50: 270-79.
- Hawley, A.H. (1986), *Human Ecology. A Theoretical Essay*. Chicago: The University of Chicago Press. Traducción castellana (1991): *Teoría de la Ecología Humana*. Tecnos, Madrid.
- Hirsch, F. (1978), *Social Limits to Growth*. Harvard University Press, Cambridge.
- Hofrichter, J. and K. Reif (1990), 'Evolution of Environmental Attitudes in the European Community', *Scandinavian Political Studies*, 13 (2): 119-46.
- Inglehart, R. (1971), 'The silent revolution in Europe: intergenerational change in post-industrial societies', *American Political Science Review*, 65.
- Inglehart, R. (1977), *The Silent Revolution*. Princeton University Press, Princeton.
- Inglehart, R. (1990), *Culture Shift in Advanced Industrial Society*. Princeton University Press, Princeton.
- Inglehart, R. (1997), *Modernization and Postmodernization*. Princeton University Press, Princeton.
- Inglehart, R., M. Basañez, J. Díez Medrano, L. Halman and R. Luijkx (2004), *Human Beliefs and Values*. Siglo XXI, Mexico.
- Katz, D. (1953), 'Three criteria: knowledge, conviction and significance', in B. Berelson and M. Janowitz, *Public Opinion and Communication*. The Free Press, Glencoe, Ill.
- McClelland, D.C. (1961), *The Achieving Society*, D. van Nostrand Co, New Jersey.
- Meadows, et al. (1972), *The Limits to Growth*. Universe Books, New York.
- PNUD (Programa de Naciones Unidas para el Desarrollo) (2004), *Informe sobre Desarrollo Humano 2004*. Ediciones Mundi Prensa, Madrid.
- Putnam, R.D. (1993), *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press, Princeton.
- Rohrshneider, R. (1990), 'The Roots of Public Opinion toward New Social Movement: An Empirical Test of Competing Explanations', *American Journal of Political Science* 34: 1-30.
- Scruggs, L. (2003), *Sustaining Abundance*. Cambridge University Press, Cambridge.
- Skrentny, J.D. (1993), 'Concern for the environment: A cross national perspective', *International Journal of Public Opinion Research*, 5: 335-354.
- Toffler, A. (1975), *The Ecospasm Report*. Bantam Books, New York.
- United Nations (1987), *Our Common Future*. UN Commission on Environment and Development. United Nations, New York.
- United Nations (2003), *The Road from Johannesburg: World Summit on Sustainable Development*. United Nations, New York.
- UNEP (United Nations Environment Program) (1999), *Global Environment Outlook*. Earthscan Publications, London.
- van der Veer, K. (1976), 'Social position, dogmatism and social participation as independent variables', in: H. Ornauer et al. (eds.), *Images of the World in the Year 2000*, Mouton, Paris.
- Weber, M. (1905/1958/1976), *The Protestant Ethic and the Spirit of Capitalism*. tr. Talcott Parsons, intro. A. Giddens.