

Are Environmental Attitudes and Behaviour Inconsistent? Findings from a Finnish Study

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Surveys concerning environmental awareness in different countries pay too little attention to the problems of consistency. The inner inconsistency of attitudes and preferences is one problem. The major problem, however, lies in the attitude-behaviour inconsistency and free-rider behaviour. New ways of integrating behaviour with environmentally favourable attitudes are needed. Empirical examples are presented from a Finnish survey to illustrate the individual utility/collective welfare dilemma of the actors and to point out the tendency of free riding. High environmental concern and environmentally favourable attitudes do not automatically lead to environmentally beneficial behaviour. Commitment to environmental goals can be improved by way of social norms and agreements. Economic incentives and private side-benefits may also turn out to be useful in increasing co-operative behaviour of the non-committed utility seekers.

Public awareness about collective goals – like environmental protection – can be increased by public debate, but it is already much more difficult to reach any consensus concerning the priority ranking of these goals and concerning the collective measures that should be taken in order to provide them. That is why ways of improving rational discourse – that is, defining validity criteria for the discussion on social choices – are so important.

But in addition to improving communicative rationality along the lines which, for example, Habermas (1981) has proposed,¹ we should also pay attention to attitude-behaviour inconsistency in a broad sense. Even if approximate unanimity concerning collective goods can be reached in society, the integration of behaviour with these accepted goals remains to be achieved. Environmental quality is a good example of collective goods which can be provided only by way of co-operative behaviour.

Environmental quality has traditionally been treated as a free good. The market mechanism does not without intervention provide incentives for the economic agents to protect common property resources. On the contrary, its emphasis of self-interested action can destroy the moral values

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needed for co-operativeness (Hirsch 1977; Hirschman 1982a, b). For example, consumption choices aiming at the increased welfare of each individual consumer have brought about environmental damage as unintentional side-effects (Uusitalo 1986a). These side-effects, however, are not in accordance with consumers' preferences. People's actual choices do not reveal their preferences concerning non-market collective or public goods such as environmental quality.

Therefore, when studying the conditions of consumer rationality, more attention should be given to the *distinction between preferences and choice*, or more generally, between stated goals and behaviour. They can be inconsistent for several reasons, as will be described below.

So far several attitude surveys have documented the evolution of environmental attitudes and concern. They show a high worriedness about decreasing environmental quality and emphasize the priority that citizens give to environmental protection among other social tasks (for a summary of these surveys among Western European populations, see, for example, Hofrichter & Reif 1990).

However, very little attention has been devoted in these surveys to the inner consistency of the expressed attitudes and priority rankings. Moreover, what is almost totally neglected is the attitude-behaviour integration problem; the obvious tendency of economic actors to act on the basis of self-interested rationality and to 'free ride' instead of co-operating when actual choices are at stake.

In the following I will shortly discuss the various consistency problems relevant in the environmental attitude surveys. Thereafter I will present some results from a Finnish survey to exemplify some inconsistencies and to demonstrate why it is essential to extend the analysis of environmental attitudes to include also measures of consistency.

Sources of Inconsistency

By 'inner inconsistency of attitudes' is meant the fact that various expressed attitudes or preferences for environmental matters can be inconsistent with each other. For example, if we ask respondents to compare environmental protection with other social goals, the results can vary according to the framing of the question, the options included, the perceived risk involved in the options, the respondents' interest in giving 'false' answers for strategic reasons, or simply because the respondent – in contrast to the rationality assumptions of economic theory – is not able to decide between options and to give complete, transitive rankings of them (e.g. Tversky 1969; Kahneman & Tversky 1979, 1984; Elster 1983).

The transitivity of a given preference ranking, for instance of the ranking

of different social goals, can be studied with the help of certain measurement procedures. In the Finnish study we used the method of Analytic Hierarchy Process, by means of which the final hierarchies or preference rankings can be derived indirectly from the respondents' original pairwise comparisons. With this method, an index can be calculated which describes the inner consistency of the respondents' choices. (The method is described in detail by Saaty 1980; see also Uusitalo 1986b.)

Also a typical feature of environmental attitude surveys is that attitudes are often measured by one-item scales only, although the combining of different items into attitude dimensions and constructing sum scales could give a more reliable basis for further analysis.

'Attitude-behaviour consistency' is usually stated as a minimum requirement for rational behaviour in economic theory: the rational actor is expected to act consistently in accordance with his/her beliefs and to choose according to his/her preference.

However, in empirical studies, very often a rather low correspondence has been found between attitudes and behaviour, or between the three 'components': the cognitive, affective and behavioural components of attitude (for a summary of findings, see, for example, McGuire 1986; Pieters 1988). The vast field of sociopsychological attitude research has provided extensive testing of the consistency hypothesis but very few clear explanations for the inconsistency.

For example, the fact has been referred to that the more specified are the measured attitudes, the better they seem to predict the (same specific) behaviour (Ajzen & Fishbein 1980). But then we are close to trivial findings. Also, other factors which intervene in the attitude-behaviour relationship have been referred to: different context factors, behavioural intentions as a mediating factor, other attitudes held by the individual and perceived social norms (e.g. Wicker 1971; Bagozzi 1982).

However, in the case of a collective good, a more plausible explanation may be found through a better understanding of the individual utility vs. collective welfare dilemma and free-rider behaviour. Many desired collective goods can only be provided with co-operative action. However, from the individual actor's point of view, it can still be rational to try to free ride; to maximize individual utility and, in addition to that, enjoy the collective good provided by others.

In the Finnish study, we tested inner consistency by studying how consistent respondents were in their rankings of social tasks. We also studied the cognitive-affective link – that is, how well environmental knowledge predicted attitudes. Attitude-behaviour consistency was studied separately.

Understanding Free-Rider Behaviour

The decision whether to co-operate or free ride when desired collective

goods are produced can be perceived as similar to the *many-party case of the Prisoners' Dilemma situation*; actors make their decision atomistically and are not committed to any social norm of behaviour. According to the non-cooperative PD game, individual utility maximizing is in fact the best option for each individual.

In this case universal co-operation is superior to universal defection (everybody wishes that the collective good would be produced) while, at the same time, defection is the dominant strategy for each individual (e.g. Sen 1973; McMillan 1979). It is easy to show that if everyone acted in accordance with his/her individual utility, it would lead to collective results that nobody preferred and that the individually rational action would not even for the individual him/herself secure the best possible outcome. Therefore, PD has been used to illustrate the failure of individual rational calculus and to exemplify the need for collective norms and agreements.

When there are numerous actors, feelings of insignificance can increase the probability of free riding. The own contribution is perceived to be of marginal importance, and one may assume that others will provide the public good anyway (Kliemt 1986).

Another and slightly different game model, the *assurance game*, could be a relevant societal solution for environmental protection. In this game, people will act in an environmentally favourable way, but they do this only if they believe that others will also co-operate. Hence, the individual's beliefs concerning the behaviour of others are crucial for the assurance game, whereas in the prisoners' dilemma, each person acts only on the basis of his/her own utility calculation.

Efficient sanctions of social norms (e.g. punishing over-speed driving) give a guarantee to the individual that others will obey the norm and act co-operatively. Therefore, willingness to co-operate in the assurance game is often associated with the willingness to support stricter control of the behaviour in question. Feedback on the relative number of those who co-operate or free ride can also be of importance. If majority is co-operating, this can further enforce co-operative behaviour in the next sequence.

The tendency to free ride can indirectly be studied with the help of certain survey questions, for example by studying the willingness of respondents to support environmental measures directed mainly to other actors as compared with measures that require their own immediate contribution. The willingness to play the assurance game can also be empirically surveyed in terms of a person's willingness to obey legal norms or to accept other types of intervention measures that apply to everybody.

We can conclude that one plausible explanation for the attitude-behaviour inconsistency found in empirical studies can be stated in the form of a 'two-type information' hypothesis: Environmental awareness and information of the social-welfare aspects of environmental problems are fairly

well distributed among the population, and people seem to use this information when they judge their social priorities and express their concern about environmental problems. However, in actual choice situations, the decision is made with the help of individual utility information only because collectively binding norms are missing or too weak. Moreover, economic incentives are too weak to guide the behaviour. The person chooses to free ride. Still, his/her preferences can honestly be in favour of environmental protection.

There are those who have committed themselves to social goals and act accordingly and those who always tend to act as free riders. However most people probably experience some kind of inner conflict when choosing between these two types of behaviour. The dilemma between Economic Man and Social Man is a built-in, permanent conflict of each person and society. Striving for collective rationality in society means, for example, that there be information available on social norms which one should follow; information on the consequences (welfare losses to everybody) if one does not co-operate; and information that convinces that others will also co-operate (Uusitalo 1989).

Some Empirical Findings from the Finnish Survey²

The survey was taken to illustrate the conflict described above between individual utility and collective welfare which seems to be one of the major obstacles for environmental protection. The empirical goals were:

- to study the relative importance of environmental quality and protection as compared with other important societal tasks, especially as compared with goals related to economic utility;
- to study the consistency between environmental knowledge, attitudes and behaviour with the aim of exemplifying tendencies towards free-rider behaviour;
- to study attitudes towards various collective measures for environmental protection.

Preference for Environment vs. Other Social Goals

Table 1 shows the preference ranking derived from the pairwise comparison of the given eight social goals.³ Employment took the first place, followed by meaningfulness of work, taxes and environmental protection, all considered approximately equally important.

Population subgroups were rather consistent in the final rankings; only slight differences were found according to gender, age or education level.

Table 1. Priorities for Social Goals Determined by AHP Method for Whole Population and by Age (relative weight values).

	Whole population	Age				
		<20	20-29	30-49	50-64	>65
Reduced unemployment	23	<u>28</u>	22	21	23	23
Meaningful work with opportunity to influence its content	17	17	18	18	17	16
Prevention of tax rises	17	15	16	17	<u>18</u>	<u>18</u>
Environmental protection	15	<u>18</u>	<u>17</u>	16	<u>12</u>	<u>11</u>
Landowners' right to utilize their land the way they please	10	07	08	10	12	<u>15</u>
International competitiveness	08	05	08	<u>09</u>	<u>09</u>	<u>08</u>
Rich cultural life	06	<u>07</u>	<u>07</u>	<u>06</u>	<u>05</u>	05
Increased opportunity for consumption	04	04	04	04	04	04
Σ	100	100	100	100	100	100
(N)	(1145)	(73)	(285)	(462)	(201)	(124)
Inconsistency index	0.25	0.27	0.23	0.23	0.29	0.27
(standard deviation)		(0.19)	(0.18)	(0.18)	(0.21)	(0.19)

Women ranked environmental protection somewhat higher than men who, in turn, emphasized more than women the competitiveness on the international market. The young emphasized employment, environment and rich cultural life somewhat more highly than other age groups; and the more educated emphasized relatively more such life qualities as meaningful work, environmental protection and rich cultural life.

The inner consistency of given pairwise rankings was not very high. It was satisfactory only for the more educated groups (the inconsistency index should be 0.20 or below; see Uusitalo 1988). This refers to the fact that intransitivities take place, and people have difficulties in stating their preferences for abstract matters. Obviously the determinant decision criteria can also be changed depending on the set of options compared.

From the final ranking we see that opportunities to increase the consumption level were consistently perceived as the least important matter. Consumption was probably somewhat undervalued because the low perceived risk involved in losing anything from the present standard (Uusitalo 1988). At any event, the low weight given to consumption as compared with other goals refers to a turn from material towards qualitative tasks in life.

However, concerning the young respondents, this result was inconsistent with their other responses, for example, to questions of how they support

Table 2. Attitudes towards Economic Growth and Satisfaction with Own Level of Consumption, by Age.

	Totally agree or agree (percentage)	Cannot say (percentage)	Totally disagree or disagree (percentage)
Finland has reached such a high level of consumption that it could give up the goal of continuous economic growth.			
All	39	25	35
Age ¹ :			
Under 20	23	48	28
20-29	30	26	43
30-49	41	24	35
50-64	47	20	32
65 and over	52	21	26
I have reached the consumption level that satisfies me.			
All	51	17	33
Age ¹ :			
Under 20	28	23	48
20-29	35	18	48
30-49	48	20	32
50-64	68	11	19
65 and over	83	8	8

1. Significant at the $p = 0.001$ level.

further economic growth, and how satisfied they are with the acquired consumption level. Table 2 shows that the young were the *least* willing to give up the goal of continuous growth and the least satisfied with the acquired consumption level.⁴

In further analyses of various environmental attitudes and behaviour a similar pattern emerged: despite their high general interest in environmental protection, the young (especially students of age 20-25) were the least willing to support collective measures in favour of the environment, and their behaviour was the least beneficial from the environmental point of view. In their everyday life, individual utility and hedonistic life tasks seem to guide behaviour more than collective welfare considerations.

The individual-collective dilemma seems to be most obvious among the young generations. This is an interesting result if we compare it with some earlier studies in which the young in particular, because of their 'post-material' values, have bred great hope of a better environment in the future (e.g. Inglehart 1982, 1983).⁵

The priority given to individual utility was also exemplified by the

Table 3. Attitudes towards Environmental Protection versus Rights of Landowners.

	Whole population %	Farmers %	Others %
Question: Which do you think is more important?			
Environmental protection	55	18	59
Landowners' rights to utilize their land as they please	28	63	24
Of equal importance	17	19	17
(N)	100 (1145)	100 (109)	100 (1036)
Statement: To prevent the destruction of natural resources, government must have the right to control private land use.			
Completely or rather agree	55	41	56
Difficult to say	24	24	29
Completely or rather disagree	21	35	15
(N)	100 (1145)	100 (109)	100 (1036)

attitudes towards 'the landowners' right to do with their land as they please'. The farmer population, which consists of landowners themselves, ranked this matter as the most important of the given social options. In a control question farmers expressed a consistent view, but this time their opinion was closer to that of the rest of the population. The question was now framed so that the use of land could also be associated with the big forest or construction industries and not with farmers (Table 3).

Environmental Concern and Subjective Experiences

The many causes of environmental concern seem to be classifiable in at least three main groups: people are worried about *pollution*, the possibility of environmental *catastrophes*, and the depreciating *aesthetic* value of nature and environments.

From Table 4 we see that issues related to water and air pollution receive highest concern in Finland, followed by the fear of oil tanker accidents and hazardous waste (e.g. nuclear waste) problems. The Finnish population is also concerned about the destruction of natural landscapes (e.g. the preservation of forest areas and lakes for recreational use) and about the environmental threat caused to flora and fauna. One reason for this is that,

Table 4. Concern about Environmental Issues in Finland.

'How concerned are you about the following issues in Finland?'		Very concerned %	Rather concerned %	Slightly concerned %	Not at all concerned %
Air pollution	(2)	34	47	17	2
Water pollution	(1)	43	46	10	1
Hazardous wastes	(6)	29	42	24	5
Threat to flora and fauna	(7)	27	40	27	5
Noise		9	27	45	18
Clear fellings, intensive silviculture		23	32	31	14
Use of fertilizers and pesticides		22	36	33	9
Drainage of marshlands		14	31	34	20
Nuclear power plants		28	23	29	20
Damage by oil accidents	(3)	36	41	20	3
Increasing amounts of waste		18	43	32	7
Health risks of pollution	(4)	37	39	20	4
Demolition of old buildings		14	22	38	25
Destruction of natural landscapes	(5)	32	43	23	3
Damming of watercourses		13	29	41	17

N = 1145

although the population is now urbanized in its occupations, the vast majority still has a close contact with the country life and out-of-door activities. (For example, most respondents had as a child been living in the country (70 percent) or spending their summertime there.)

The general concern centres around 'big' matters. On the other hand, when respondents were asked about their *subjective experiences*, the most disturbing environmental problem in their own everyday life was the littering of the environments (Table 5). Almost all problems accumulate in big cities; for instance half of the population in big cities was disturbed daily by traffic pollution and one-third by traffic noise.

While objective, technical knowledge about environmental problems did not predict environmentally favourable attitudes, the past subjective experiences did this much better. For example, green attitudes are more typical for urban dwellers than for people living in the country.

The consistency between cognitive and affective-behavioural components seems to hold only for 'subjective knowledge'. Those who have themselves suffered from environmental hazards are more concerned about the problems and more willing collectively to do something. The Chernobyl

Table 5. The Most Disturbing Environmental Problem in One's Own Life Setting (responses in percentages).

	Yes
I am going to read you a list of items that some people might find disturbing. Are any of them disturbing you or your family's life? (N = 1145).	
Littering of environment	38
Offensive industrial odours and industrial air pollution	35
Pollution by traffic	34
Industrial and municipal waste waters	23
Noisy work-place	23
Handling of toxic substances at work or in work-place	22
Traffic noise	19
Unsatisfactory waste management	15
Noisy way of life of neighbours	9

case supports this proposition; technical knowledge about the risks involved in nuclear power plants was there already before the accident, but opinions changed only through concrete experience.⁶

The attitude-behaviour inconsistency and the free-rider tendency can be exemplified with the littering problem: it is the most disturbing everyday nuisance as was shown in Table 5. In a control question 95 percent stated that littering irritates them. However, more than half admitted that they sometimes litter themselves.

Other Environmental Attitudes

Sum scales were constructed from the original attitude statements which described 'Perceived responsibility and opportunity to influence', 'Willingness to pay for environmental quality' and 'Support of collective measures'. All were ranked significantly higher among females than males. Through the study, women systematically showed a more favourable attitude towards environmental matters than men.

Education seemed to be a less important factor in defining environmental attitudes than has been proposed in earlier studies. However, along with education, the ability to admit one's own responsibility increases (e.g. to admit the pollution effects of own car driving) and so does the willingness to support environmental protection via higher taxes.

Young people seem to be more optimistic than the old about their opportunities to have an effect in environmental matters. In fact, however,

Table 6. Preference for Different Protection Measures in Order to Conserve Nature and Preserve Natural Resources (responses in percentages).

	Whole population %
Imagine the following situation. People want to preserve a rapid in its natural state, but a power company wants to harness it for energy supply. Which one of the following solutions to the conflict do you prefer?	
The power company is paid out of government tax revenues not to harness the rapid	8
The rapid is protected by law and no compensation is paid to the power company	60
An environmental tax is imposed on the power company if it harnesses the rapid	23
Cannot say	9

N = 1145

they had very seldom really tried to have an influence; older generations made many more efforts of complaint or political influence. The attitude-behaviour inconsistency is obvious not only for young respondents. Of the whole sample about 80 percent said that they will make a complaint if they notice environmental problems concerning them. However, despite the high concern about many problems, only 11 percent really had made a complaint.

As stated before, young respondents were also least willing to support collective protection measures. Moreover, the support of collective measures decreases with income level. Some people obviously think that, to a certain degree, they can individually 'buy' themselves a good environment, e.g. by selecting a quiet and nice residential area. Consequently, they tend to disfavour collective measures that influence their own behaviour.

Preferences for Protection Measures and Free Riding

The tendency to free ride is also indicated in the attitudes towards various collective measures. Collective solutions as such are supported, but the support will diminish the more the measures imply a sacrifice or change of own behaviour.

Table 6 shows broad public support for collective legal norms aimed at influencing the environmentally relevant decisions of business firms. Direct regulation by law is preferred to pollution charges, at least in a case when decisions are taken about saving or totally destroying a natural resource.

Table 7. Preference for Different Measures to Reduce the Harmful Effects of Traffic.

	Strong support	Slight support	No support	Cannot say
Here is a list of measures which can be used to reduce the environmentally harmful effects of traffic but all of which involve costs. How would you rate them in terms of your personal support?				
Reducing unnecessary driving by maintaining high gasoline prices	11	33	52	4
Making lead-free gasoline and catalytic converters mandatory	51	37	8	4
Working on public transport to make it an inexpensive alternative to private transport	64	28	5	2
Curbing the number of cars by maintaining a high automobile tax	5	19	72	4
Better enforcement of speed limits	39	40	17	3
Improvement of driving habits through attitudinal education	68	26	3	3
Restricting private motoring in urban centres	26	42	28	4

N = 1145

Table 7 presents attitudes towards collective measures aimed at preventing damage caused by citizens themselves. The table shows the support for different ways to prevent pollution and noise caused by private cars. Those measures are supported (e.g. attitudinal education, better public transport) which do not necessarily require any change of own habits. Catalytic converters and better enforcement of speed limits are also supported, provided that they are mandatory to all (cf. assurance game). Measures that require immediate economic or behavioural sacrifices are resisted, although they, in fact, could be much more efficient in attaining the desired goal.

The willingness to pay for good environmental quality was quite high. For example, over 60 percent of respondents expressed their willingness to pay more taxes to improve environmental quality, and there is wide support for price differentiation in favour of environmentally less harmful products. However, the willingness to pay is not so high as, let us say, the concern about air pollution would suggest. Consumers, give first priority to measures that do not require sacrifices on their part.

The Attitude–Behaviour Consistency

The study of attitude–behaviour consistency showed that, although attitudes and behaviour are positively correlated as can be assumed, the association is very weak. The total concern about environmental problems and the attitude towards collective measures were those attitudes that were somewhat correlated with behaviour. Own responsibility and the belief in own possibilities of influence were associated only with recycling behaviour but not with other types of environmentally relevant behaviour. In many cases, background factors such as gender and age were better predictors of behaviour or behaviour intentions than attitudes.

One conclusion from this is that even very positive attitudes towards environmental protection do not automatically mean that the person also adopts a way of life that is beneficial to the environment. Therefore collective agreements, social norms and economic incentives are needed in order to integrate preferences and behaviour and discourage free riderism.

Conclusion

Environmental awareness and the demand for environmental quality have grown fast in most countries. However, the matter gets more complicated if we problematize the survey results and take into account the inconsistencies in preference rankings and between attitudes and behaviour.

People have difficulties in expressing complete and transitive preferences on abstract societal goals. Many good things are desired simultaneously, and the results will vary according to the choice of options, risk involved and so on. When preferences are measured for such multidimensional matters as environmental quality or other social goals, a thorough-going transitivity cannot be expected. To draft a preference ranking or welfare function for a whole society is thus always somewhat arbitrary.

The individual utility vs. collective welfare dilemma which is characteristic for collective or public goods was illustrated with examples of environmental attitude–behaviour inconsistency and the tendency to act as a free rider. Despite desiring the collective good – environmental quality – each individual often tries to shun own sacrifices and wishes that others will bring about the collective good.

Consequently, one plausible explanation for attitude–behaviour inconsistency is that expressed favourable attitudes towards environmental protection are based on existing information on collective interests and social welfare, while in actual choice situations, the decisions are still based on individual utility considerations. Social norms and economic incentives are both necessary in order to integrate behaviour with the common interests.

The individual–collective dilemma will hardly ever be totally solved, and best solutions to environmental problems probably entail ways in which both utility seeking and socially committed behaviour are simultaneously made use of. A person's activity in favour of environmental protection is usually increased if he/she can also attain some private side-benefits from the activity in addition to contributing to the collective goal. This is illustrated by the observation that those who suffer from environmental hazards are more willing to do something and to support collective measures.

The collective-good character of environmental quality and free-rider behaviour explain why environmental preferences are not revealed through people's actual choices on the material-goods market. These types of collective demands do not articulate themselves through market demand. Neither does the political mechanism function in favour of them because interest groups in environmental matters are too weak. Therefore, surveys where preferences are studied directly are still an important way to improve rational political discussion about environmental matters.

NOTES

1. Rational argumentation in society takes place within several frames and with varying criteria of validity, as Habermas (1981) has suggested. The rationality criterion for factual statements should be their truthfulness. This is established in scientific discourse. The rationality criterion for norms is based on arguments of universality, of their 'rightness' and 'justness' for everybody. This can be accomplished with the help of practical and ethical discussion. Even the 'rationality' of preferences and evaluative expressions can be discussed on the basis of an investigation of their autonomy vs. manipulability, or whether they have been forced to adapt to external conditions. Validity claims of this sort are suitable for aesthetic and evaluative discussion. The last-mentioned discourse is also advocated by Elster (1983) when he bids for a closer study of the autonomy of preferences.

The above-mentioned types of rational argumentation usually tend to be confused in the public discourse. For example, one seeks to validate normative statements by trying to prove their truthfulness, factual statements are sometimes evaluated as expressed preferences and so on.

As an example of a differentiation among the different discourses we can take statements from the energy–ecology debate. 'Air pollution causes cumulative forest damage' is a factual statement and should be discussed with the help of scientific proof. 'Industry needs more energy' is a normative statement, and the argument should be pursued according to how justified it will be from the welfare point of view to increase the number of power plants, considering both their positive and negative impacts. 'I am/I am not in favour of the nuclear power plant' are preferences or evaluative expressions which should be discussed on the basis of their authenticity and non-manipulability, and by studying whether the beliefs are distorted by biased information or not, or whether the person expresses a 'false' preference for strategic reasons.

2. For detailed reports, see Uusitalo (1986b) and Aalto (1986). The sample consisted of 1,145 individuals representing the entire Finnish population over 18 years of age. A Deming type of sampling was applied to obtain the initial addresses. The sample was stratified according to local districts and the degree of industrialization. Information obtained from the consensus indicated that the sample was representative with regard

to the demographic and geographical distributions of the whole population.

The data were collected by professional interviewers using prestructured questionnaires. Internal validity was improved by several control questions and by constructing sum scales of the attitude measures. Factor analysis was utilized in constructing and selecting items for the sum scales. Dependence was measured with the help of cross-tabulations, partial correlations and regression analyses. The AHP method was used to determine the population's order of preference for the compared social goals.

3. The pairwise comparisons were responses to the question: 'In the following we ask you to compare pairwise certain social values or goals which are all considered important in Finland. Please, say *first which one* of the two compared matters you consider to be more important, and thereafter, say on the nine-point scale *how much more important* you feel it is. Scale value 1 = the two matters are equally important, . . . scale value 9 = the preferred matter is extremely more important.' (Compared pairs and scales were presented to the respondent on a card.)
4. In contrast to age, income was not significant in explaining satisfaction with the present consumption level; in the two lowest income brackets the satisfaction was even higher than in the middle income brackets. Only when moving to the highest income bracket did the satisfaction increase somewhat.
5. Inglehart's results have previously been criticized from another angle; it has been proposed that the definition of the content of 'post-material' values can greatly vary in different population subgroups, and this causes contradictory results when measuring their support (e.g. Laffarty & Knutsen 1985; Savage 1985).
6. The attitudes towards nuclear power plants in Finland tend to be divided; half of the population is worried while the other half is not. The negative attitude became much stronger after the Chernobyl accident, but the attitudes tend gradually to resume to the 50:50 position of pre-Chernobyl. However, the worry about the nuclear waste problem has been high (80 percent) all the time.

REFERENCES

- Aalto, P. 1986. 'Kuluttajien ympäristöä koskevat asenteet (Consumer Attitudes Towards the Environment)', *Helsinki School of Economics* D:77.
- Ajzen, J. & Fishbein, M. 1980. *Understanding Attitudes and Predicting Behavior*. New Jersey: Prentice Hall.
- Bagozzi, R. 1982. 'A Field Investigation of Causal Relations among Cognitions, Affect, Intentions, and Behavior', *Journal of Marketing Research* 19, 562-584.
- Elster, J. 1983. *Sour Grapes - Studies in Rationality and Irrationality*. Cambridge: Cambridge University Press.
- Habermas, J. 1981. *Theorie des kommunikativen Handelns*. Band 1 und 2. Frankfurt: Suhrkamp.
- Hirsch, F. 1977. *Social Limits to Growth*. London: Routledge & Kegan Paul.
- Hirschman, A. 1982a. 'Rival Interpretations of Society: Civilizing, Destructive, or Feeble?', *Journal of Economic Literature* 20, 1463-1484.
- Hirschman, A. 1982b. *Shifting Involvements - Private Interest and Public Action*. Princeton University Press.
- Hofrichter, J. & Reif, K. 'Evolution of Environmental Attitudes in the European Community', *Scandinavian Political Studies* 1990 13(2), 119-146.
- Inglehart, R. 1977. *The Silent Revolution: Changing Values and Political Styles among Western Publics*. Princeton University Press.
- Inglehart, R. 1983. 'The Persistence of Materialist and Postmaterialist Value Orientations', *European Journal of Political Research* 11, 81-91.
- Kahneman, D. & Tversky, A. 1979. 'Prospect Theory: An Analysis of Decision under Risk', *Econometrica* 47, 263-291.
- Kahneman, D. & Tversky, A. 1984. 'Choices, Values, and Frames', *American Psychologist* 39, 1-10.

to the demographic and geographical distributions of the whole population.

The data were collected by professional interviewers using prestructured questionnaires. Internal validity was improved by several control questions and by constructing sum scales of the attitude measures. Factor analysis was utilized in constructing and selecting items for the sum scales. Dependence was measured with the help of cross-tabulations, partial correlations and regression analyses. The AHP method was used to determine the population's order of preference for the compared social goals.

3. The pairwise comparisons were responses to the question: 'In the following we ask you to compare pairwise certain social values or goals which are all considered important in Finland. Please, say *first which one* of the two compared matters you consider to be more important, and thereafter, say on the nine-point scale *how much more important* you feel it is. Scale value 1 = the two matters are equally important, . . . scale value 9 = the preferred matter is extremely more important.' (Compared pairs and scales were presented to the respondent on a card.)
4. In contrast to age, income was not significant in explaining satisfaction with the present consumption level; in the two lowest income brackets the satisfaction was even higher than in the middle income brackets. Only when moving to the highest income bracket did the satisfaction increase somewhat.
5. Inglehart's results have previously been criticized from another angle; it has been proposed that the definition of the content of 'post-material' values can greatly vary in different population subgroups, and this causes contradictory results when measuring their support (e.g. Laffarty & Knutsen 1985; Savage 1985).
6. The attitudes towards nuclear power plants in Finland tend to be divided; half of the population is worried while the other half is not. The negative attitude became much stronger after the Chernobyl accident, but the attitudes tend gradually to resume to the 50:50 position of pre-Chernobyl. However, the worry about the nuclear waste problem has been high (80 percent) all the time.

REFERENCES

- Aalto, P. 1986. 'Kuluttajien ympäristöä koskevat asenteet (Consumer Attitudes Towards the Environment)', *Helsinki School of Economics* D:77.
- Ajzen, J. & Fishbein, M. 1980. *Understanding Attitudes and Predicting Behavior*. New Jersey: Prentice Hall.
- Bagozzi, R. 1982. 'A Field Investigation of Causal Relations among Cognitions, Affect, Intentions, and Behavior', *Journal of Marketing Research* 19, 562-584.
- Elster, J. 1983. *Sour Grapes - Studies in Rationality and Irrationality*. Cambridge: Cambridge University Press.
- Habermas, J. 1981. *Theorie des kommunikativen Handelns*. Band 1 und 2. Frankfurt: Suhrkamp.
- Hirsch, F. 1977. *Social Limits to Growth*. London: Routledge & Kegan Paul.
- Hirschman, A. 1982a. 'Rival Interpretations of Society: Civilizing, Destructive, or Feeble?', *Journal of Economic Literature* 20, 1463-1484.
- Hirschman, A. 1982b. *Shifting Involvements - Private Interest and Public Action*. Princeton University Press.
- Hofrichter, J. & Reif, K. 'Evolution of Environmental Attitudes in the European Community', *Scandinavian Political Studies* 1990 13(2), 119-146.
- Inglehart, R. 1977. *The Silent Revolution: Changing Values and Political Styles among Western Publics*. Princeton University Press.
- Inglehart, R. 1983. 'The Persistence of Materialist and Postmaterialist Value Orientations', *European Journal of Political Research* 11, 81-91.
- Kahneman, D. & Tversky, A. 1979. 'Prospect Theory: An Analysis of Decision under Risk', *Econometrica* 47, 263-291.
- Kahneman, D. & Tversky, A. 1984. 'Choices, Values, and Frames', *American Psychologist* 39, 1-10.

- Kliemt, H. 1986. 'The Veil of Insignificance', *European Journal of Political Economy* 2, 333–344.
- Lafferty, W. & Knutsen, O. 1985. 'Postmaterialism in a Social Democratic State', *Comparative Political Studies* 17, 411–430.
- McGuire, W. 1986. 'The Vicissitudes of Attitudes and Similar Representational Constructs in Twentieth Century Psychology', *European Journal of Social Psychology* 16, 89–130.
- MacIntyre, A. 1985. *After Virtue. A Study in Moral Theory*, 2nd edn. London: Duckworth.
- McMillan, J. 1979. 'The Free Rider Problem: A Survey', *Economic Record* 55, 95–107.
- Pieters, R. 1988. 'Attitude–Behavior Relationships', in Van Raaij, F., van Veldhoven, G. & Wärneryd, K., eds., *Handbook of Economic Psychology*. Dordrecht: Kluwer, 147–204.
- Saaty, T. 1980. *The Analytic Hierarchy Process*. New York: McGraw-Hill.
- Savage, J. 1985. 'Post-materialism of the Left and Right', *Comparative Political Studies* 17, 431–452.
- Sen, A. 1973. *On Economic Inequality*. Oxford: Clarendon Press.
- Tversky, A. 1969. 'Intransitivity of Preferences', *Psychological Review* 76, 31–48.
- Uusitalo, L. 1986a. *Environmental Impacts of Consumption Patterns*. Aldershot: Gower.
- Uusitalo, L. 1986b. *Suomalaiset ja ympäristö – tutkimus taloudellisen käyttäytymisen rationaalisuudesta* (Finns and the Environment – A study in the Rationality of Economic Behaviour). Helsinki. Helsinki School of Economics A:49.
- Uusitalo, L. 1988. 'Environment and Other Social Goals – Exploring Inconsistency and Differentiation of Social Goal Preferences', *Wissenschaftszentrum Berlin, Discussion Papers FS II* 88–407.
- Uusitalo, L. 1989. 'Economic Man or Social Man – Exploring Free Riding in the Production of Collective Goods', in Grunert, K. & Ölander, F., eds., *Understanding Economic Behaviour*. Dordrecht/Boston/London: Kluwer Academic Publishers, 267–283.
- Wicker, A. 1971. 'An Explanation of the "Other Variables" of explanation of Attitude–Behavior Inconsistency', *Journal of Personality and Social Psychology* 19, 18–30.