Non-Economic Motivation for Contingent Values: Rights and Attitudinal Beliefs in the Willingness To Pay for Environmental Improvements

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ABSTRACT. *This paper reports on a national CVM survey administered in combination with a psychometric scale on pro-social environmental attitudes to test for non-economic motivations for WTP. The multi-item scale measures biospheric, altruistic, and egoistic motives, and analyzes their association with rights-based (deontological) and consequential (utilitarian) ethics. I test hypotheses concerning the existence of distinct value orientations, and the relationships between attitudes, ethics, protest bids, and WTP. Contrary to some recent claims based upon convenience samples, environmental attitudes are found to be significant in explaining intended WTP; this is associated with an egoistic motive and rights-based, rather than consequential, beliefs.* (JEL Q00, D46, D64)

I. INTRODUCTION

The contingent valuation method (CVM) has developed from an experimental academic approach with a handful of studies twenty years ago to the most commonly applied method for obtaining monetary values for a wide range of environmental changes and entities. The exponential growth in publications on the subject over the last decade has included a range of critiques among which have been concerns over the content and meaning of the values being derived. These include the continuation of earlier critiques from philosophy (Sagoff 1988; O'Neill 1993), economics (Hausman 1993) and psychology (Kahneman et al. 1993). While covering diverse arguments, a common element in these works is that the values being derived are in some sense non-economic.

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The theoretical basis for contingent valuation is individuals expressing their preferences in order to maximize their utility subject to an income constraint, or to minimize their expenditures subject to a utility constraint. O'Neill (1993) explains how this preference utilitarian theory of value is but one among a competing field of ways in which humans can and do approach and value the world. Very large willingness to pay (WTP) bids have been associated with public concerns for moral choices (Vadnjal and O'Connor 1994). Sagoff (1988) is a proponent of separating political and economic decisions, and regards environmental CVM applications as misdirecting citizens to act as consumers. If WTP is an expression of "what ought to be ethically right," it is argued to be a political gesture of social citizens rather than self-orientated consumers and to show that "the environment is not well represented by economic value" (Svedsater 2003, 123). Economic value is firmly based within consequential utilitarian moral theory, so the contention should be that this economic ethical system of judging what is right fails, or is poor at representing environmental value. The role of preferences in determining environmental choice may then be questioned. Psycholo-

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gists are concerned by the economists' assumptions that preferences are stable, complete, and transitive, rather than labile and constructed with susceptibility to framing effects and variations in context and elicitation procedures (Fischhoff 1991; Kahneman et al. 1993; Schkade and Payne 1994). What ties these various arguments together is their central concern for understanding the realm of economic values and whether contingent values fall within that realm. This paper contends that the answer lies in a better understanding of motives behind human behaviour and, as suggested by Vatn (2004), the use of observations made in valuation studies to improve choice theory, especially with respect to anomalies.[1]

Kahneman and Knetsch (1992) describe WTP under the CVM as the purchase of moral satisfaction rather than an exchange value. This has been linked to a contribution model claiming that, while economists interpret WTP as purchasing a public good, respondents are stating charitable contributions reflecting their attitudinal concerns. Kahneman et al. (1993, 314) then argue that, if the only objective of measurement is to rank-order issues, WTP is "not the preferred way of doing so because it is psychometrically inferior to other measures of the same attitude."

Social psychologists have conducted studies which directly measure attitudes in order to understand stated WTP (Stern, Dietz, and Kalof 1993; Guagnano, Dietz, and Stern 1994; Stern, Dietz, and Guagnano 1995). They have hypothesized that the economic model favors motivation by egoistic and selfish altruistic motives as opposed to a biospehric orientation. Their studies give conflicting results and show environmental attitudinal scales as rather weak explanatory variables for WTP. However, this work fails to measure WTP as conceived by economists and instead requests payments for very general entities, good causes, and environmental schemes; this means even strong, significant, and persistent results would be questionable in terms of their relevance to contingent values (see Spash 2000b). Thus, an interesting recent development is work by economists employing attitudinal scales as quantitative measures in CVM studies, allowing motivational relationships to be tested.

Environmental attitudes have been hypothesized to be determinants of WTP leading to protest bidding by pro-environmentalists because they are more likely to hold deontological or rights-based beliefs which reject economic consequentialist and utilitarian positions (Spash 1997). In order to test for such relationships, Kotchen and Reiling (2000), hereafter KR, employed the New Ecological Paradigm (NEP) to measure pro-environmental attitudes in a WTP mail survey of Maine residents. The NEP was designed by Dunlap and Van Liere (1978) using 12 statements, with which respondents agree or disagree on a Likert-type (4-point) scale, to capture key aspects of environmentalism. The KR study excluded all users, that is, those stating they would visit the species (peregrine falcons and shortnose sturgeons),[2] and all protest bids. Specific motive questions assessed belief in: option, bequest and existence values, altruism, and rights-based beliefs. They found the most important motive to be agreement with a rights-based belief, and that those with pro-environmental attitudes are more likely to bid higher and hold such beliefs.

Cooper, Poe, and Bateman (2004), hereafter CPB, built on KR, but attempted a more structured approach. A key aim of CPB was to show that non-economic motives cannot be separated from economic ones and therefore WTP reflects all underlying motives, so justifying "total

[1] One anonymous referee stated that CVM survey data and analysis can only support implications for CVM and not for choice theory. This is based upon the mistaken belief that the only measures of invalidity in an hypothetical preference is whether it leads to an action in practice, i.e., stated equals revealed preference. I return to this point in the conclusions.

[2] This is used as a surrogate for passive/indirect use which requires assuming all classified non-users have no other potential direct uses for the species, although this is not necessarily the case.

economic value" as a valid expression of preference utilitarianism. They put forward a model including: (1) pro-environmental attitudes measured by the NEP; (2) specific motives taken from KR, but adding three items: one on use, one on obligation and one on responsibility; (3) a psychometric scale stated variously to measure "altruism" or "prosocial attitudes," which involves ascribed responsibility, personal norms, and awareness of consequences. A convenience sample, University of East Anglia students, provided the data which CPB censored for protest responses. WTP regression analysis combined the factors under (1) and (3) while those under (2) were treated separately after reclassification into scales on human value, natural value, responsibility, and obligation. The attitudinal scale, under (2), proved to be unrelated to WTP, but internally weak, while the NEP lacked a significant positive relationship with WTP. The NEP score was strongly associated with those in the natural value group who paid more, and with existence and bequest motives and rights beliefs. Existence-related motives for paying appeared significantly more important than use-related motives. CPB state that, what they term, ethically based motives were of "substantially different importance" and the rights beliefs (termed intrinsic value) amongst the most important. However, they reject any separability of such beliefs because these can be linked to the natural value category which was a significant explanatory variable of WTP. CPB note that the distribution of bid categories was unrelated to pro-environmental attitudes (i.e., the NEP).

These studies show a relationship between WTP and statements of beliefs in rights and that underlying motives for WTP are complex arising from motives related to economic use and natural value orientations. Yet they provide contradictory results in terms of the role played by attitudes and their relevance for understanding WTP. The studies also fail to clearly delineate the rights position and confuse this with statements about intrinsic and existence values in their analysis. Indeed the studies erroneously talk of "ethical motives" as if economic value had no ethical basis and such motives could be excluded from economics. In order to correct this error, the categorization of ethical positions is explicitly addressed as part of this study. CPB also state as their final conclusion that "a more reliable measure of prosocial attitude could provide insights to motivation akin to those achieved with the NEP scale." The study reported here employs just such a measure rather than relying upon the NEP.

The next section develops hypotheses and explains terminology concerning environmental attitudes, ethics, and their relationship to stated WTP and protest bids. The selection of the psychometric scale is explored with reference to work in the United States led by Stern. A framework for characterizing non-economic motives to derive empirical expectations is developed along with four hypotheses concerning the nature and role of attitudes. Attitudinal scales and ethical categorisation are then applied in a case study on stated WTP for wetlands re-creation where over 700 members of the general public in the United Kingdom were interviewed; this allows more generally relevant results than CPB. Data analysis is reported with respect to the hypotheses, and results discussed in terms of understanding the motives behind WTP and the implications for choice theory.[3]

II. ATTITUDES AND ETHICS IN CONTINGENT VALUATION

Both the studies by KR and CPB employ the NEP as their main measure of

[3] Divergence between stated and revealed preferences has been a preoccupation of economists. This might be related to Fishbein and Ajzen's (1975) attitude-behavior model where intended and actual behavior are distinguished (Spash 1998). In response to a referee's comments I note here that, the current paper focuses upon stated preferences and employs a value-belief-norm model, rather than revealed preferences and that of Fishbein and Ajzen.

environmental attitudes. The NEP is a standard measure of environmental concern (Schultz and Stone 1994, 32) and has been updated and expanded to 15 items (Dunlap et al. 2000). However, the NEP has also been criticized for failing to incorporate work on the social psychology of attitude-behavior interactions (Stern, Dietz, and Guagnano 1995). Stern et al. (1995) found a reduced form (7 item) NEP scale was indistinguishable from an awareness of consequences (AC) scale, both psychometrically and in terms of the relationship to behavioral intentions. They conclude that the two scales measure a common set of general value orientations which underlie, inform, and form more specific beliefs and attitudes. Three underlying value orientations are then hypothesized: biospheric, social altruistic, and egoistic (Stern and Dietz 1994).

Based on empirical findings, Stern (2000) has developed a value-belief-norm model of human behavior explaining interlinkages between these value orientations, the NEP, and pro-environmental attitudes. This model generalizes Schwartz (1977) norm activation theory by postulating that adverse consequences to valued objects activate personal norms, such as a sense of obligation to take pro-environmental actions. Thus, for example, people who value other species highly will be concerned about environmental conditions that threaten such species (biospheric value orientation), while those who care about other people will be concerned for their health and well-being as a result of environmental quality (social-altruism). The NEP is then argued to be a "folk" ecological theory from which beliefs about the adverse consequences of environmental change can be deduced (Stern, Dietz, and Guagnano, 1995).

Stern, Dietz and Guagnano (1995) compared the NEP to a General Awareness of Consequences (GAC) scale constructed from 10 items (reduced from 15 by factor analysis) addressing the three value orientations. Two WTP scenarios, taxes to preserve tropical forests and reduce gasoline consumption, were analyzed. WTP regression results were poor; the R^2 for the various bid functions being gasoline tax, 0.08 NEP, 0.09 GAC, and forest scenario, 0.12 NEP, 0.09 GAC. The only significant variables were NEP and age under WTP for forests. While the scales explained political action well, the weak WTP results apparently support the findings of CPB. However, the results are mitigated by the generality of payment scenarios and aggregation of value orientations.

Value-belief-norm theory suggests that environmental attitudes differ due to underlying values. Pro-environmental attitudes may then be better measured by directly employing specific AC scales for each hypothesised value orientation (Stern, Dietz, and Kalof 1993; Guagnano, Dietz, and Stern 1994; Stern and Dietz 1994; Stern, Dietz, and Guagnano 1995; Stern et al. 1995).

HYPOTHESIS 1: *Environmental concerns can be represented by three distinct value orientations which are expressed through awareness of consequences for oneself, others, and nature: namely the egoistic (AC_{ego}), social-altruistic (AC_{soc}), and biospheric (AC_{bio}).*

Individuals may hold different environmental concerns simultaneously and these can vary between cultures (Stern, Dietz, and Kalof 1993, 326). Results for the United States show a two-factor structure where egoistic values form the first, while biospheric and social-altruistic combine as the second (Stern et al. 1995). Evidence shows these orientations relate to Schwartz (1994) value scale items with egoistic concerns correlated positively with self-enhancement and negatively with self-transcendence, while biospheric-altruistic concerns do the opposite (Schultz and Zelezny 1999).

More specific AC scales permit detailed hypothesis testing on the economic and "non-economic" motives behind WTP. Stern, Dietz, and Kalof (1993) used WTP scenarios on paying income taxes and increased gasoline prices to "protect the environment." WTP was predicted significantly by AC_{ego} in both cases and AC_{bio}

for income taxes.[4] They conclude WTP questions activate an economic calculus and elicit an egoistic value orientation. Guagnano, Dietz, and Stern (1994) used a three-item AC scale covering social-altruism and biospheric value orientations, and a perceived personal costs scale using two-egoistic scale items from the previous study. WTP for public goods was hypothesized to be altruistic behaviour. Six WTP scenarios were employed, that is, four "environmental goods" (reduced global warming, increased paper recycling, reduced deforestation, and improved potable water quality) and for two of these "goods" two alternative payment mechanisms (i.e., trust or tax). Regression analysis was restricted to the positive bids. The AC_{ego} scale was non-significant across all six WTP scenarios in contradiction of the previous study. The $AC_{bio\text{-}soc}$ scale was related to WTP for two trust fund scenarios and one tax scenario. The authors claim this supports the contribution model, and that WTP into a trust was strongly influenced by altruistic beliefs, while WTP taxes was not (Stern et al. 1995, 1631). However, this is inconsistent with the varying significance of $AC_{bio\text{-}soc}$ as reported across the WTP scenarios. Most importantly for CVM practitioners, all six WTP scenarios suffer poor specification of the payment mechanism and environmental improvement (see Spash 2000b), making the WTP questions in-principal-charitable-contributions rather than intended bids for a marginal trade-off.

Such work highlights confusion as to whether WTP should be expected to relate to an egoistic, biopspheric, or altruistic orientation. The terminology here needs some clarification. The egoistic concern can be defined as only protecting the environment when the expected benefits for the individual themselves (excluding others) outweighed the costs. This conception of individual motive fits under neoclassical economic theory where the egoistic attitude would be expected to be strongest in determining WTP. Narrow egoism can be expanded to a concept of selfish altruism where the welfare of others enters the utility function of an individual. This can be differentiated from socially driven altruism.

Social altruism is based upon concern for others without personal gain, and arises where the direct consequences for others is no longer the primary motive. This has been linked with a benefit from the act of giving or "warm glow" giving (Andreoni 1990), and a psychic utility reward from social compliance, which CPB call indirect private benefit. However, a social altruistic norm is more clearly defined as moving beyond economic frameworks, where utility consequences for the individual are all important (selfish altruism), and into those where doing what is right and meeting social norms is the aim, regardless of the specific consequences or utility to the individual. Thus, altruism can be associated with egoism where defined in terms of selfish gain or with biospherism where self transcendence is key. Biopsheric value orientation means an individual expresses and acts upon moral principles which extended "beyond kin and beyond all of humanity to other species, to places, and to the biosphere itself" (Stern, Dietz, and Kalof 1993, 327). However the meaning of "moral" is left hanging in this definition.

The key to understanding whether a value orientation is "non-economic" requires clarifying the basis in moral reasoning. Here both the studies by CPB and KR prove inadequate. KR equate rights-based to ethical beliefs, as if only such beliefs were ethical. In fact utilitarianism, upon which the economic model is based, is an ethical belief system itself. CPB restrict ethical motives, noted to be "altruism" and "intrinsic value," to being a sub-category of a utilitarian model, and then focus upon whether these sub-elements are separable. Altruism is misinterpreted as an ethical system itself rather than an expression resulting from such a system which might be either rights based or utilitarian. The CPB question on altruism appears utilitar-

[4] The natural log was taken of the WTP results after adding an amount ($0.5 and $0.005) to recode zero bids and OLS regression analysis was conducted.

ian but unclear: "I like knowing that other people use the broad and enjoy seeing plant and animal life there." They fail to draw the key distinction between the motive to increase one's own utility due to specific consequences and the motive to do the right thing for its own sake. Similarly, their "intrinsic" category appears to be a statement of rights based beliefs but is unclear: "Ecosystems like that in the broad have a right to exist that should be supported by humans". That is, an individual can agree strongly with this statement because they believe the right is justified by the utilitarian consequences or because they believe (deontologically) ecosystems have moral standing in and of themselves.

If we return to the consideration of whether a value orientation is related to a stated payment on grounds consistent with economic theory, the interpretation depends upon the basis for the decision. Egoistic orientation, as weighing-up the consequences for oneself, appears most clearly compatible with a preference utilitarian approach. Altruism can be selfish, and then compatible with economic theory, or social and norm driven, in which case it moves closer to a rights based justification. Biospheric values are most consistent with regarding non-human entities as having moral standing and are then compatible with rights based beliefs. For an economic model to recognize the moral standing of, say, animals would require taking their utility directly into account on the same basis as human welfare; indeed this was part of Bentham's (1970) utilitarian belief system which was based upon the ability to suffer pain and feel pleasure whether human or non-human. Non-human animals lack moral standing in modern economics and are objects to be traded along with other goods and services from which moral agents gain utility.

That a pro-environmental attitude can be consistent with economic and non-economic reasoning means a strong association of such attitudes with WTP is insufficient to support a case for non-economic motives being important. The point of measuring environmental attitudes is rather to test which norms, beliefs, and values are operative as motives in order to improve understanding and explanation of WTP. In itself, this does nothing to challenge traditional economic reasoning and can indeed be used to improve bid functions. The challenge to, or confirmation of, the validity of the economic model arises from the association of the attitude with a "non-economic" belief system. Testing whether pro-environmental attitudes are consistent with economic theory requires identifying their basis in an ethical system. From the above we have:

HYPOTHESIS 2: *Consequentialist economic ethical beliefs are associated with egoistic value orientations while right-based ethical beliefs are associated with social altruism and biospheric value orientations.*

If this were the case it would be consistent with the findings of Schultz and Zelezny (1999) that egoistic concerns associate with concepts of self and biospheric with self-transcendence.

Ethically motivated refusals to trade can be related to a belief in inviolable rights so that actions are intrinsically of value or deontological (Spash 1997). A problem arises for standard economic choice theory if an individual believes that aspects of the environment have to be protected without regard to the cost in terms of other commodities. The normal indifference curve asserts that individuals are able and willing to exchange any bundle of goods for another and can do so for a set of bundles without affecting their welfare level. Refusals to trade can be reflected in lexicographic preferences which are signified by a discontinuity in the preference function giving a single point, or bundle, as the indifference set in goods space. Evidence from CVM studies supports the presence of deontological positions and lexicographic preferences for wildlife (Stevens et al. 1991), animals, plants and ecosystems (Spash and Hanley 1995) and endangered species (Lockwood 1998; Spash 2000b). CVM experts then recommend removing such responses from the sample as representing "ethical protesting" (Bateman et al. 2002, 276).

A standard division of WTP responses is by positive, zero, and protest bids with the latter being censored (as in KR and CPB). Protest bids are variously described, but are essentially zero bids for reasons other than placing a zero value on the environmental change under consideration. Common protest reasons are dislike of the bid vehicle and/or institutions involved, which may also be related to issues of trust or fairness (see Jorgensen et al. 1999; Jorgensen, Wilson, and Heberlein 2001), and claims about a lack of information. Other protest reasons include such factors as already making contributions and various demands for alternative approaches. Legitimate reasons for bidding zero are usually: the change being unimportant, other things being more important, and lack of income. Where environmentalism is associated with rights this has been hypothesized to be associated with protest zero bids and so to the systematic exclusion of respondents' opinions (Spash 1997). Jorgensen and Syme (2000) have criticized censoring of protest bids because of evidence relating protests to WTP via attitudes; censoring would then bias CVM samples (e.g., towards those who favor paying and higher income groups). If protest bids are related to environmental attitudes, then the fact that they are censored in the studies by KR and CPB raises concerns over biasing the results.

HYPOTHESIS 3: *Protest bids are unrelated to pro-environmental attitudes.*

However, evidence has tended to show rights-based beliefs result in higher WTP rather than protests against the CVM (Spash 2000a, Kotchen and Reiling 2000). In this case, WTP estimates are not biased due to the exclusion and censoring of environmentalists' protest bids, but rather would produce values which fail to represent economic trade prices because they arise from rights-based beliefs (i.e., giving on the basis of "doing the right thing" rather than maximum worth of the environmental change). This means, for example, a difference between paying for a marginal change to gain a benefit and paying as a charitable contribution. Of course, some rights-based individuals may protest, while others bid positively. The important issue is whether these are merely random across the population of statistically significant occurrences.

HYPOTHESIS 4: *WTP is positively related to those pro-environmental attitudes which are founded upon rights-based beliefs.*

In order for environmental attitudes to be expected to correlate with WTP, the scenario must involve an environmentally significant behavior. In a standard CVM survey, this may be indicated indirectly by an individual's responses reflecting the importance of site visits, the importance of environmental issues, full engagement in the survey as reported by the interviewer, and prior preferences about the environmental change. If a scenario is dominated by non-environmental issues then a relationship with environmental attitudes would not be expected.

Stern (2000) notes, besides attitudes, three sets of important causal variables can influence environmentally significant behaviors: contextual factors, personal capabilities, and habits or routine. Context covers a range of social, economic, political, legal, and institutional factors which may be operating upon the individual. In CVM, bias against a bid vehicle is an example related to the institutional setting. External factors can be barriers to perceived control over a behavior, for example, "paying is no good unless everyone pays," or "this institution can't be trusted." Personal capabilities include knowledge, skills, income, social status, power, and literacy. CVM surveys routinely measure these using socio-demographic variables, for example, age, education, and income. Habits would appear unproblematic under CVM unless the payment scenario involves breaking old habits or routines. Thus, the relationship between a WTP scenario and environmental attitudes is contingent upon the environmental significance of the behavior, capabilities, and context.

III. EMPIRICAL STUDY DESIGN

A relatively small area was being considered for conversion from farmland to a wetland ecosystem in the Fens of East

Anglia, United Kingdom. A trust fund bid vehicle was used to reflect the institutional arrangement which would arise in practice. An open-ended WTP question format was employed with the survey administered (by an independent market research company) using personal interviews, as recommended in the CPB study to reduce potential biases. The survey was designed in six sections: background, WTP, attitudes and ethics, socio-economic data, interviewee difficulties, and interviewer opinion.[5]

Awareness of Consequences

Stern and colleagues had usually relied upon two or three items for each AC scale. The combination of questions from all their previous studies allowed the number of items to be expanded to five for AC_{soc} and AC_{ego} and four for AC_{bio}. Table 1 details the items and their origin. All scale items were measured on a four-point, Likert type scale (matching the approach of Stern and colleagues) and randomly mixed for delivering in the survey.

Ethical Belief Systems

In order to identify the occurrence of rights-based beliefs, indicative of a refusal to make trade-offs, direct questions on ethical beliefs were employed. The method used was that developed by Spash (2000a) for probing the presence of lexicographic preferences in CVM surveys. Respondents were asked to choose between consequentialist and rights positions in terms of which was most relevant to the environmental improvement, that is, wetland re-creation with benefits for endangered bird species. Those making a specific attribution of rights were probed further to refine the definition of their position in terms of the strength of their refusal to trade.

In this study, respondents were initially told that: "A major aim of re-creating the wetland is to provide sanctuary for endangered species of birds such as Bewick's swan, the pintail, and gadwall." They were then asked which one of four statements most closely matched their opinion about the wetlands re-creation scheme. These four statements represented key ethical positions and are shown in Table 2. Respondents could also choose "Can't answer—this is too complicated." Refinement of the rights-based position through an additional question, concerning the preparedness to defend attributed rights in the face of a loss of living standard, identified those holding a fifth position consistent with lexicographic preferences. As shown in Table 2, these five positions can also be interpreted in terms of norm activation theory,[6] although the distinction between the two rights-based positions is harder to directly map. Norm activation theory would describe the positions as a personal moral obligation to undertake a pro-environmental act. In contrast to the approach of CPB, such ethical positions cannot be measured as items on a Likert-type scale, but are instead mutually exclusive categories.

IV. RESULTS

The sample consisted of 713 in-home personal interviews using a two-stage, stratified sampling technique with random walk. Fifty-nine locations were used spread across the United Kingdom, but with just under half within the Fens. A 60:40 female/male ratio was obtained. Age distribution was fairly flat giving over representation in the

[5] Section A introduced a range of public policy issues and then narrowed down on the wetlands topic. Basic knowledge of wetlands and the study area were probed. Various information was employed (e.g., graphics, maps, ecosystem schematics) covering the environmental change and trust fund. After the WTP request debriefing questions completed Section B. Questions on ethical beliefs and environmental attitudes formed Section C and socio-economic data Section D. Finally, interviewees were probed for any difficulty in answering questions and on the content of the survey, Section E, and interviewers gave their opinion on respondent difficulties, Section F.

[6] I am grateful to Brad Jorgensen for bringing this to my attention.

TABLE 1
ITEMS FOR MEASURING ENVIRONMENTAL ATTITUDES

Variable	Study[a]	Phrasing	Exact Wording Used
ACEgo1	3	+ve	Environmental protection will provide a better world for me and my children.
ACEgo2	3	+ve	Environmental protection is beneficial to my health.
ACEgo3	1, 2	−ve	Protecting the environment will threaten jobs for people like me.
ACEgo4	1, 2[e]	−ve	Laws to protect the environment limit my choices and personal freedom.
ACEgo5	1, 3[e]	+ve	A clean environment provides me with better opportunities for recreation.
ACSoc1	3	+ve	Environmental protection benefits everyone.
ACSoc2	3	+ve	Environmental protection will help people have a better quality of life.
ACSoc3	1	−ve	We don't need to worry much about the environment because future generations will be better able to deal with these problems than we are.
ACSoc4	1, 2, 3[b]	+ve	The effects of pollution on public health are worse than we realize.
ACSoc5	1, 3[c]	+ve	Pollution generated here harms people all over the earth.
ACBio1	3	−ve	While some local plants and animals may have been harmed by environmental degradation, over the whole earth there has been little effect.
ACBio2	1, 2, 3[b]	+ve	Over the next several decades, thousands of species will become extinct.
ACBio3	1, 2, 3[b]	−ve	Claims that current levels of pollution are changing earth's climate are exaggerated.
ACBio4	1, 3[d]	+ve	The balance of nature is delicate and easily upset.

[a] Study 1 (Stern, Dietz, and Kalof 1993), Study 2 (Guagnano, Dietz, and Stern 1994); Study 3 (Stern, Dietz, and Guagnano 1995; Stern et al. 1995).
[b] Variations on this were used in Study 2 and 3 including negative phrasing for Soc4.
[c] A variation on this was used in Study 3.
[d] NEP scale item, the new NEP variation was used in Study 3.
[e] A variation on this was used in Study 2.

above 55 years age group. The income variable suffered a high number of refusals (25%) and a large number (23%) of respondents claiming a gross income (before tax or any deductions) of less than £4,801, which implied under reporting of income.

Awareness of Consequences

Initial confirmatory factor analysis tested for the expected three factor solution. The model failed to fit the data with X^2 significant and the goodness of fit and root mean square error of approximation concurring. Next, factor loadings were obtained from a Maximum Likelihood extraction of a three-factor solution, using an oblique rotation to allow for correlation of common factors. The X^2 was significant, indicating that more factors would be necessary to reproduce the observed correlations. The pattern matrix showed inconsistency with the three-factor model: Factor 1, five items covering ACego1, 2, 5 ACsoc1, 2; Factor 2, two items covering ACsoc5, ACbio2; and Factor 3, four items covering ACego3, 4, ACsoc3, ACbio1; all these items loaded above 0.5 except ACsoc1 at 0.4.[7] Maximum Likelihood extraction was repeated with equamax rotation simplifying the factors and variables, that is, minimizing the number of variables that load highly on a factor and factors needed to explain a variable. The overall results were consistent with the previous tests and are reported in Table 3, which includes the results of Stern, Dietz, and Guagnano (1995). The item signs reflect the association within a factor and are as expected, that is,internally consistent based upon phrasing.[8]

The primary factor is an egoistic orientation but with an altruistic aspect with

[7] The most important relationships are taken as those items with the greatest loading. Due to the variation of loadings with rotation method, the consistency of results across rotations also needs to be taken into account. There is no clear significance cut-off level for loading significance; e.g., the 0.40 level was used by Stern, Dietz, and Guagnano (1995), while others, e.g., Dunlap and Van Liere (1978), use 0.30 . Judgment is thus required as to the strength, significance, and interpretation of items, especially where results are at neither loading extreme.

[8] There is one exception which, under Factor 1, is the non-significant result for $AC_{ego}4$.

TABLE 2
CATEGORIES OF ETHICAL BELIEF

	Position Statement in Survey	Equivalence in Norm Activation Theory
Rights for endangered species regardless of personal living standard	"Such endangered species need protection because they have a right to life which cannot be traded against economic considerations." Plus right defended in face of extreme personal costs.	Holds an obligation and accepts responsibility.
Rights for endangered species qualified by living standard	"Such endangered species need protection because they have a right to life which cannot be traded against economic considerations." Plus rights withdrawn in face of extreme personal costs.	Holds an obligation and accepts responsibility.
Consequentialist favoring non-humans	"Protection of such endangered species must be weighed against economic considerations, but in this case, the endangered species should come first."	Holds an obligation, but can deny responsibility in some circumstances.
Consequentialist favoring humans	"Protection of such endangered species must be weighed against economic considerations, and in this case, people's livelihoods come first."	Denies an obligation, but can hold a responsibility in some circumstances.
Human's first	"Too much concern is shown for birds and not enough for humans, so I would rather see the resources used to help humans."	Denies an obligation and denies responsibility.

three of the egoistic and three of the altruistic items loading. Contrary to the findings of Stern, the biospheric items generally fail to load with Factor 1; the exception is ACbio4, which also loaded on Factor 2. Factor 2 is led by social altruism and a global concern evidenced by the biospheric elements. However, the three biospheric items found by Stern and colleagues to group, fail to do so here. Factor 3 is less clear, lacking strong lead items and consisting of all three value orientations, although egoistic items 3 and 4 are highly distinctive from the other egoistic items in the analysis and fail to load on the other factors. The general orientation of Factor 3 seems to be an anti-environmental sentiment or lack of worry over possible environmental problems and a concern about the potentially negative personal consequences of environmental protection. This implies a tendency for negative egoistic attitudes towards the environment to be expressed as a separate factor rather than as a low weighting on the egoistic scale of Stern.

Rather than the hypothesized three-value orientations the results indicate at best two consistent with the model. Both the egoistic and the biospheric orientations appear as separate factors with the latter the weaker and neither being independent of an altruistic aspect. The altruism being associated with the egoistic items is concerned with benefits for self and others rather than exclusively others and so consistent with a selfish altruism. Two items load at lower significance across the factors (i.e., ACsoc4, ACbio4) with the biospheric of these, from the NEP, appearing poor at distinguishing value orientations. Overall, the key items of Factor 1 would seem to provide a match to the economic model of value orientation.

The strongest items for these two factors are used to form attitudinal scales, representing egoistic-altruistic (EgoAlt) and social-biospheric (SocioBio) orientations, for further use in analysis. The EgoAlt scale consists of ACego 1, 2, 5, and ACsoc 1, 2 giving a Cronbach's Alpha reliability score of 0.81. Adding the next strongest item, ACsoc4, would only marginally improve the alpha score, while excluding it reduces correlation with Factor 2. The strongest elements are ACego1 and ACsoc2. The scale normalized by division with the number of items has a mean of 3.23 and median of 3.20 with 32 respondents excluded as missing data. The SocioBio scale consists of four items ACsoc 5, 4 and ACbio 2, 4. This has an Alpha of 0.69 with the strongest element

TABLE 3
FACTOR ANALYSIS

	Item Loadings			
	Factor 1	Factor 2	Factor 3	Stern, Dietz, and Guagnano (1995)
ACego1	**0.79**	0.23	−0.20	0.69
ACego2	**0.54**	0.29	−0.10	0.79
ACego3	−0.06	−0.05	**0.49**	
ACego4	0.01	−0.03	**0.54**	
ACego5	**0.51**	0.25	−0.13	0.60
ACsoc1	**0.44**	0.38	−0.09	0.53
ACsoc2	**0.78**	0.23	−0.12	0.78
ACsoc3	−0.22	−0.18	**0.59**	
ACsoc4	0.39	**0.46**	−0.12	0.45
ACsoc5	0.24	**0.71**	−0.07	0.62
ACbio1	−0.07	−0.27	**0.54**	−0.42
ACbio2	0.12	**0.55**	−0.14	0.56
ACbio3	−0.22	−0.03	0.36	−0.54
ACbio4	0.35	**0.44**	−0.16	

	Initial Eigen Values			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.54	32.44	32.44	2.41	17.24	17.24
2	1.67	11.92	44.36	1.71	12.19	29.43
3	1.11	7.94	52.30	1.46	10.43	39.85

Notes: Maximum likelihood with equamax rotation, converged in 7 iterations. Numbers in boldface type denote the most important relationships on the basis of an above 0.40 factor loading.

being ACsoc5. The normalized scale has a mean of 3.19 and median of 3.00 with 55 respondents excluded as missing data. Both scales show a low response frequency at the bottom end with scores below 3 totalling 16.4% and 19.5% of the sample for EgoAlt and SocioBio respectively.

Ethical Belief Systems

Approximately 37% of respondents attributed rights to birds of which the majority (21%) claimed they would defend these rights at the cost of their living standard being severely reduced, while the remainder (16%) would not do so. Those who weighed-up the consequences concerning protection were the largest group with 21% favoring endangered species and 26% favoring human livelihoods. Only 9% placed humans first unconditionally, taking a position consistent with denying any obligation or responsibility. Don't know/refusal categories comprised 6.5%. Excluding them from the sample, half the respondents took an ethical position consistent with economic theory, that is, choice motivated by the need for a consequentialist trade-off.

In order to address the second hypothesis, these ethical category data are used in combination with the two attitudinal scales to determine the relationships via multinomial logistical analysis. The five ethical categories provide the potential reference categories with none being a distinct standard for comparison.[9] Analysis was therefore conducted using each of the ethical positions in turn as the reference category. The likelihood ratio test shows that both SocioBio and EgoAlt contribute to the model (X^2 significant at

[9] The category of consequentialist favoring humans might be regarded as approximating a position consistent with a narrow mainstream economic model of human behavior.

TABLE 4
MULTINOMIAL LOGISTIC REGRESSION OF ETHICS AND ATTITUDES

		Reference Category			
		Humans First	Utility Humans	Utility Animals	Rights Weak
Right Strong regardless of living standard	Intercept	−11.28	−6.89	−3.94	−4.67
		(0.00)	(0.00)	(0.00)	(0.00)
	SocioBio	1.29	1.17	0.86	0.96
		(0.01)	(0.00)	(0.01)	(0.01)
	EgoAlt	2.58	0.87	0.34	0.56
		(0.00)	(0.01)	(0.34)	(0.15)
Right Weak subject to living standard constraint	Intercept	−6.61	−2.22	0.73	
		(0.00)	(0.00)	(0.53)	
	SocioBio	0.33	0.22	−0.10	
		(0.53)	(0.56)	(0.80)	
	EgoAlt	2.01	0.31	−0.22	
		(0.00)	(0.41)	(0.57)	
Utility Animals consequentialist favoring non-humans	Intercept	−7.34	−2.95		
		(0.00)	(0.00)		
	SocioBio	0.43	0.32		
		(0.40)	(0.35)		
	EgoAlt	2.24	0.53		
		(0.00)	(0.12)		
Utility Humans consequentialist favoring humans	Intercept	−4.39			
		(0.00)			
	SocioBio	0.12			
		(0.82)			
	EgoAlt	1.70			
		(0.00)			

Note: Coefficients with significance in parenthesis.

less than 0.01). The Nagelkerke pseudo R^2 is 0.15. Parameter estimates for all reference categories are reported in Table 4 with significance in parentheses. Parameters with significant negative coefficients decrease the likelihood of that response category with respect to the reference category, while parameters with positive coefficients increase the likelihood of that response category. Two significant results can be seen here. First, SocioBio increases the likelihood of being strongly rights-based relative to all other ethical categories. This is consistent with expectations, although a positive association with weak rights might have also been expected. Indeed the weak rights position proves poorly predicted by the model (no cases for it are classified correctly in the classification table). Second, EgoAlt increases the likelihood of being in the consequential/utilitarian or rights based categories relative to "humans first," that is, there is a negative relationship between EgoAlt and "humans first." This is consistent with the EgoAlt scale measuring only positive attitudes towards the environment.[10] If EgoAlt were operating across the full range of pro- and anti-environmental concerns then it should be a significant factor decreasing the likelihood of being in the rights categories relative to the consequential/utilitarian categories. In fact the results are non-significant except for strong right with reference category consequential favoring humans, where the relationship is positive.

In terms of the second hypothesis, the results are unsupportive of the association between consequentialist economic ethical beliefs and egoistic value orientations. However, there is supporting evi-

[10] Inclusion of Factor 3 as a four-item scale acts exactly as EgoAlt, but with the opposite sign.

dence for the association of rights based ethical beliefs with social altruism and biospheric value orientations. Indeed, the strong rights position is consistently reinforced the stronger are an individual's social-biospheric values.[11]

WTP and Environmental Attitudes

Hypothesis 3 concerns the relationship of environmental attitudes to protest bids. Jorgensen et al. (1999) tested for the presence of common underlying structures for protests and found two factors: fairness with respect to payment, and ethics in terms of perceived rights with respect to environmental quality. Inability to pay loaded on both factors. While economists regard inability to pay as a legitimate zero bid reason, Jorgensen et al. provide evidence that it is psychologically indistinguishable from protest responses. Thus, in the current analysis, it is kept as a separate category to permit identification of its similarity to or difference from protest vs. zero bids.

Protest bids were elicited using an open-ended format allowing coding after completion of the survey. Where multiple reasons occurred (25 cases) the dominant reason was adopted and where this was unclear the coding was as "other." There were 207 (29%) positive bids, 107 (15%) zero bids, 77 (11%) protest bids, 104 (14%) "too poor," 36 (5%) refusals, and 182 (26%) responding "don't know."[12] The "don't know/refusal" categories are normally censored from CVM results being equated to missing data (that is, item non-response), despite being important for analysis of motives. Where a study fails to allow for such categories, they can appear as zero bids. If non-response reasons have been collected, as here, the "don't know/refusal" responses can be reclassified as zero bids, protests or inability to pay (see for example, Jorgensen et al. 1999). In this study, the aim is to show the implications for standard CVM studies as conducted by economists and therefore these responses are excluded. Tests were also conducted on their inclusion and the results were similar to those reported next.[13]

The relationships between environmental attitudes and categories of WTP responses are shown in Table 5, which reports different runs of a multinomial logistic regression. The likelihood ratio test shows that both SocioBio and EgoAlt contribute to the model (X^2 significant at 0.02 and 0.00, respectively). The Nagelkerke pseudo R^2 is 0.18.

The stronger EgoAlt attitudes the less likely individuals are to bid zero and the more likely they are to bid positive amounts relative to all other categories. So, here egoistic attitudes encourage positive bids generally and protesting or claiming inability to pay rather than a legitimate zero bid. The results for protest bids are also highly significant with respect to SocioBio attitudes. Here, the stronger are SocioBio attitudes, the less likely is a protest bid and instead the more likely is a positive bid, a zero bid, or a claim of inability to pay (in that order in terms of significance). Thus, there are clearly relationships between environmental attitudes and WTP cate-

[11] Exploration of socio-economic model constructs revealed gender as a significant factor. Being female decreased the likelihood of holding strong species rights over both human-based positions. Females were also less likely to hold a consequentialist position favoring animals relative to both human based positions and soft rights. This contradicts the idea that females might be more environmentalist on the basis of biospheric values (Diamond and Orenstein 1990). This might support females being more family/person centered ("mother effect"), and men focusing on economic consequences in terms of well-being ("father effect") (Stern, Dietz, and Kalof 1993). However, the latter is qualified by the strong species rights result.

[12] In the national sample the largest WTP group comprised the zero bidders (including too poor and protests) at 40%; in the local sub-sample positive bids were the largest category by a few percentage points.

[13] If non-response reasons are used to reallocate all these responses to other categories, as if they were normal zero bids the results for highly significant parameters remains unchanged, as does the overall pattern and results; the main two differences are for SocioBio under the protest vs. zero bid case to become less significant (0.04 to 0.16) and for EgoAlt under too poor vs. protest to become significant (0.79 to 0.08).

TABLE 5
MULTINOMIAL LOGISTIC REGRESSION OF WTP AND ENVIRONMENTAL ATTITUDES

		Reference Category		
		Protest Zero	Too Poor	Zero Bid
Positive bid	Intercept	−5.83	−4.22	−7.91
		(0.00)	(0.00)	(0.00)
	SocioBio	1.25	0.50	0.31
		(0.00)	(0.17)	(0.43)
	EgoAlt	0.90	1.02	2.41
		(0.04)	(0.01)	(0.00)
Zero bid	Intercept	2.08	3.69	
		(0.13)	(0.00)	
	SocioBio	0.94	0.19	
		(0.04)	(0.66)	
	EgoAlt	−1.52	−1.39	
		(0.00)	(0.00)	
Too poor	Intercept	−1.61		
		(0.24)		
	SocioBio	0.75		
		(0.09)		
	EgoAlt	−0.13		
		(0.79)		

Note: Coefficients with significance in parenthesis.

gory responses, and in particular between protest zero bids and attitudes. While there are some similarities, there are also distinct differences in the relationship between WTP categories and SocioBio attitudes as opposed to EgoAlt attitudes.

"Too Poor" and "Protest Bids" have the same signs and significance across categories for EgoAlt but not for SocioBio. This suggests for the egoistic group the choice between a protest reason and claiming inability to pay is similar while for the social-biospheric group there is a difference. Thus, the finding of Jorgensen et al. (1999), that these two categories are psychometrically similar, is only partially supported.

WTP, Attitudes, and Rights

I use a bid curve in order to explore the relationship between WTP, rights, and pro-social environmental attitudes. The standard approach using open-ended CVM data is to assume a linear relationship between the natural logarithm of bids and a range of explanatory variables. Zero bids were given a positive but inconsequential value (£0.001). The semi-log equation was estimated using OLS regression. There were 495 responses after removing the "don't knows/refusals."

The variables used are summarized in Table 6 and model runs are shown in Table 7. The first three models show the relationships between the attitudinal scales and holding a belief in species rights. In Model 1, just the attitudinal variables are included. In Model 2, the addition of "Rights" makes the SocioBio scale less significant, but also shows it to be redundant in adding little explanatory power. The previous analysis showed SocioBio was strongly related to rights based beliefs. Inspection of the correlation matrix shows an association with Rights but to a far greater extent EgoAlt attitudes (Pearson correlation 0.20 and 0.62, respectively). However collinearity is not a serious problem in Model 1 where tolerances are reasonable (0.63) and the variance inflation factor is below 2 (1.6), although the condition index for SocioBio is 20 (i.e., above 15 indicating collinearity may be a problem). Model 2 shows "Rights" have a very high tolerance (0.95) so that only 5% of the variance can be explained by other variables, but the

TABLE 6
VARIABLES FOR THE REGRESSION ANALYSIS

Variable	Definition	*N*	Min.	Max.	Comments
LNWTP	Log WTP	495	−6.9	5.3	Natural log of WTP
Visitf	Future visit	711	1	5	1 very unlikely to 5 very likely
Envknow	Environmental knowledge	713	0	1	1 if named two environmental concerns
Priorpf	Prior preferences about wetlands	713	0	1	1 if a preference for more wetlands before information
Changepf	Change preferences	713	0	1	1 if reported preferences changed by survey
EgoAlt	Egoistic-altruistic environmental attitude	681	1	4	Scale from 1 to 4 based on egoistic and selfish altruistic belief items
SocioBio	Social-biospheric environmental attitude	658	1.5	4	Scale from 1 to 4 based on social altruistic and biospheric belief items
Rights	Rights for endangered bird species	667	0	1	1 if in either absolute or qualified rights categories
Edu16	Low education level	710	0	1	1 if educated to 16
Agemid	Middle aged	712	0	1	1 if individual 34 to 45
Increfus	Refused to give income	713	0	1	1 if refused income level
Female	Gender	713	0	1	1 if female

condition index is 21. Removal of the SocioBio variable improves the tolerance of both the remaining variables to 0.97 and the condition index falls to 16.6 for "Rights." Model 3, therefore, drops SocioBio and this shows no loss of explanatory power. Both attitudes and ethical category appear to be important explanatory variables for WTP but so far no other socio-economic variables have been included so the robustness of the result is unknown.

Next, the aim was to construct the best socio-economic model in terms of statistical fit and consistency with theoretical expectations. The variables analyzed included knowledge at both general and specific levels, ex-ante and ex-post preferences, and socio-economics in terms of income, age, education, and gender. Public awareness of environmental problems was revealed by asking respondents to name two environmental issues, besides nature conservation, which were of current concern to them. Only 30% of the sample did so, with 46% being unable or unwilling to do so, and the remainder naming just one environmental issue. This was used to create a dummy variable on environmental knowledge/awareness, "Envknow." After being shown a map of The Fens, with an inset showing its location in the United Kingdom, 60% of respondents claimed to have visited the area. Likelihood of future visits declined with distance and the majority of non-locals were unlikely to do so. This gave a variable on the likelihood of future visits "Visitf." Self-reported preference changes have been shown to have a significant positive relationship to WTP and the way in which information is processed to be strongly related to fundamental ethical beliefs (Spash 2002). Data on both prior preferences over wetlands expansion, "Priorpf," and self-reported preference changes due to the survey, "Changepf," were collected. Other variables are self-explanatory, excepting income, which employed a dummy on refusals due to large item non-response and apparent under reporting.

Model 4 in Table 7 shows the resulting socio-economic model. The explanatory power is quite good for this type of analysis, with an adjusted R^2 of 0.27 and all variables significant at the 99% level, except for gender. There were no collinearity problems with all tolerances at 0.88 or above and the highest condition index being 8 for gender. Those who intend to visit the area in future bid a higher amount suggesting that use values are significant for the wetland area. The significance of middle age might be a cohort effect (e.g., high disposable income, concern for children's future). Educational effects are as expected with

TABLE 7
Regression Analysis of Attitudes, Ethics, and WTP

	Coefficient (Significance *t*-Test)				
	Model 1	Model 2	Model 3	Model 4	Model 5
EgoAlt	2.66	2.52	3.19		1.49
	(0.00)	(0.00)	(0.00)		(0.00)
SocioBio	1.30	1.06			
	(0.02)	(0.07)			
Rights		1.41	1.62		1.14
		(0.00)	(0.00)		(0.00)
Envknow				2.29	1.94
				(0.00)	(0.00)
Visitf				0.48	0.44
				(0.00)	(0.00)
Priorpf				2.15	1.76
				(0.00)	(0.00)
Changepf				2.51	1.82
				(0.00)	(0.00)
Increfus				−1.78	−1.77
				(0.00)	(0.00)
Agemid				−1.44	−1.00
				(0.00)	(0.03)
Edu16				−1.00	−0.93
				(0.01)	(0.01)
Female				0.72	
				(0.05)	
(Constant)	−15.65	−14.87	−13.84	−5.40	−9.82
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Adjusted R^2	0.12	0.14	0.14	0.27	0.30
F-test	32.77	23.92	37.85	23.63	22.14
(significance)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	451.00	424.00	446.00	488.00	441.00

lower education, leaving school early, being associated with lower bids. The refusal to give income proved highly significant and was associated with paying less. Thus, a refusal to give income category seems to reflect a type of protest. The two variables on preferences before and after the payment request show significant relationships with WTP. The prior preference in favor of wetland re-creation was expected to have a positive relationship with WTP. People who claimed their preferences had changed due to the information pack were also prepared to pay more. This implies that the CVM is explicitly forming preferences about the intention to pay for the environmental improvement being presented.

Next, Model 3 and Model 4 were combined to discern the role of attitudes and ethics in comparison with other socio-economic variables. Only gender, the weakest element of the socio-economic model, became non-significant. Model 5 shows the combined regression with all variables significant at the 99% level. Tolerances are 0.86 or above for all variables and the highest variance inflation factor is 1.2. The adjusted R^2 is improved to 30%. Underlying this result is the contribution of adding each variable following a stepwise procedure. The strongest variable is EgoAlt explaining 11% of the variation, next is Envknow at 7%; all other variables contribute from 1% to 3%, with "Rights" average at 2%. Thus, results show a strong association between the egoistic environmental attitudinal scale and WTP, while rights based beliefs are better at explaining WTP than their associated attitudinal measure of social-biospheric values.

V. DISCUSSION AND CONCLUSIONS

CVM research has suggested that elicited values are invalid measures of economic welfare benefits when they derive from ethical beliefs and attitudes which are inconsistent with the microeconomic model of human behavior. Some may object that freely made decisions reflect an individual's unquestionable preferences. As long as persons would actually pay, they should have their preferences satisfied and these preferences are legitimate. Thus, while knowing about preferences and their motivation may be interesting "we have no basis for invalidating them."[14] The only problem is apparently that CVM is hypothetical and therefore preferences may prove to be invalid if, and only if, they can be substantiated as failing to reflect an actual choice. The CVM is then meant to reflect choice theory without reflecting upon choice theory.[15]

This paper raises the profile of, and relates to, several critical aspects of this approach. First, all elicited values derive from ethical beliefs because all concepts of "value" have a basis in moral philosophy. Modern economics has merely chosen a specific value system: preference utilitarianism with humans currently alive as the only entity with moral standing. This moral basis is implicit and neoclassical economists are not trained to identify what they do as connected with applied philosophy. The essential links between economics and ethics fail to disappear merely because, unlike classical economists, we now tend to ignore them. Second, preferences can only rule supreme if they are the sole basis for moral decision-making. In contrast, acts of judgment require considering often conflicting, incommensurable, multiple values, rather than relying upon the whim of preferring one thing to another. Third, preferences are commonly invalidated. If this were not the case, then a preference for murder, rape, or genocide would be just as valid as one for strawberry ice cream. Clearly, merely being willing and able to pay is neither a strong moral basis for individual action or judging social welfare. Rights can be seen as one counter to a world run by preferences. Fourth, the position, that the act of choosing shows economic behavior, is untenable. Even in actual markets, choices are made for multiple reasons and many are inconsistent with the economic model of behavior even within its own terms, for example, intransitive or lexicographic. Outside of these terms, the bounds of mainstream economics are limited by concerns for equity, justice, rights, and so on.

As argued by Vatn (2004), two camps can be discerned in economic valuation: those who regard all anomalies as "measurement bias" to be removed by careful design and data censoring, and those who dismiss the whole exercise, and CVM in particular, due to inconsistency with neoclassical theory. The research reported here shows that understanding the motives behind responses to CVM surveys is important for improving choice theory and that Vatn's third way can be achieved with neither of the alternative camps being correct. In particular, different aspects of motivation for environmental values can be identified using the extensive work on the measurement of attitudes and psychometric scales.

In reviewing the work of social psychologists and economists, using attitudinal measures and relating them to WTP, certain inadequacies were found in some of the scales employed and in particular their face validity. The commonly used NEP was rejected in favor of an approach based upon the work of Stern and colleagues, which allowed testing of the value orientation of respondents and related this to norm activation theory and pro-social behavior. Value here being the underlying

[14] This statement is taken from an extended critique by an anonymous referee.

[15] The relevance of hypothetical and experimental evidence for choice theory is sometimes discounted because this is not "real" behavior. Yet hypothetical WTP results for public policy are justified on the basis of consistency with theoretical expectations. Such a dogmatic position merely appears as a tactical defence of economic theory against unpalatable research results.

motive, rather than the outcome of behavior (as in economics). Various forms of this scale had been applied to generalized WTP questions in the United States, resulting in conflicting conclusions across different studies about the roles of altruistic, egocentric, and biocentric value systems as explanatory variables. The research reported here advanced this work by using a large semi-random national public sample and in-house interviews, applying the scale outside of the United States for the first time, and measuring WTP for a well specified environmental change. In addition, the importance of moral reasoning in understanding non-economic motives was clarified, definitions were made, and specific categories of ethical positions were employed.

Four hypotheses were developed on the basis of research in both social psychology and economics. First three value orientations were identified for testing to see if they actually factored out in accordance with expectations. Second, consequential economic ethical beliefs were hypothesized to be associated with an egoistic value orientation, while rights-based ethical beliefs were associated with social-biospheric value orientations. Third, protest bids were hypothesized to be unrelated to pro-environmental attitudes. Fourth, stated WTP was hypothesized to be positively related to pro-environmental attitudes, which were themselves associated with rights-based beliefs.

Two value orientations, egoistic and biospehric, were found to group in factor analysis, but neither was distinct from altruism. The egoistic selfish-altruistic factor inadequately captured negative or anti-environmental sentiments which formed a separate factor. This implies the scale items could be improved to provide greater discriminatory power, and this might also help discern and improve the measurement of the value orientations. The two-factor structure is consistent with Stern et al. (1995). Despite the lack of evidence indicating three distinct value orientations, more specific environmental attitudes may be organized around distinct valued objects. The aim would then be to construct better scale items relating to the specific value orientations. A complication here is that social psychological research suggests attitudes are often associated with multiple, and even contradictory, values (Eagly and Chaiken 1993). Yet, the results here show that distinct value orientations (predicting a general, unidimensional concern for the harmful consequences of environmental problems) can be measured. Specific suggestions and challenges are to: (1) make biospheric value items more distinctly concerned for the outcomes related to the biosphere as opposed to beliefs about events and their uncertainty, for example, climate change or species extinction; (2) clarify the distinction between social-altruism and selfish altruism; and (3) capture both negative and positive environmental attitudes on a single scale.

Social-biospheric and egoistic-altruistic attitudes were both found to be related to ethical categories, but not exactly as hypothesized. Social-biospheric attitudes did increase the likelihood of being strongly rights based as expected although weak rights were poorly predicted. The association of egoistic-altruistic attitudes with consequential economic ethical beliefs proved non-significant except in one case, where they increased the likelihood of being in the strong rights category compared to being consequential favoring humans. Overall, the multinomial logistic regression results show the attitudinal scales are related to ethical positions, but only explain the extremes well (i.e., strong rights and humans first). They are effectively blunt instruments in this regard. The egoistic-altruistic scale appears to be poor at addressing the underlying motives for environmental attitudes because the scale produces results more akin to an NEP scale, that is, measuring only positive environmental feelings. The implication is that better measures of these value orientations are required. Indeed the results do justify further exploration in this direction because there are statistically significant relationships despite the bluntness of the scale measures. At the same time, the results reveal the importance of using

refined classifications of ethical categories because more aggregated approaches would obscure the significant results found here.

Both social-biospheric and egoistic-altruistic attitudes were related to WTP categories. The egoistic-altruistic attitudes were more likely to be associated with positive bids than protests, but more likely to be associated with protests or claims of inability to pay than zero bids. Social-biospheric attitudes were associated with a lower likelihood of protesting and greater chance of biding positive or zero or claiming an inability to pay. Thus, positive environmental attitudes are associated with protest bids but they reduce the occurrence rather than increasing it. This supports previous findings that censoring protest bids can bias the sample and in the current case would reduce the presence of non-rights based individuals. As noted earlier, both CPB and KR censored protest bids.

The scenario used fulfilled the requirement of an environmentally significant behavior as evidenced by future visitation, environmental knowledge and prior preferences all being positively related to WTP. Thus, conditions appeared suitable for testing the association of environmental attitudes to WTP bids, although protests signified the importance of the institutional context. Personal capabilities were relevant in terms of age, education and readiness to pay. The egoistic-altruistic attitudes scale proved highly significant and explained more of the variance in WTP than any other variable. The social-biospheric scale was weaker and proved to explain little of the variance beyond that covered by egoistic-altruistic attitudes and rights based beliefs. At the same time the idea that stated WTP in CVM is merely an attitude fails to find support given an explanatory power of 11% for egoistic-altruistic attitudes. The presence of "Rights" as an explicit factor in the regression, and to the extent that pro-environmental attitudes (EgoAlt) were found to be rights based, supports the positive relationship between rights and WTP.

Overall, the results support the finding that egoistic and selfish altruistic motives are important determinants of WTP. However, this is not to the exclusion of other motives such as the biospheric which were expressed directly as ethical beliefs in species rights. In addition, the egoistic values being expressed in this study failed to be associated with consequential ethical positions, which means the results failed to support the standard economic model. The results also show that use related WTP samples hold rights based beliefs; so contrary to CPB's claim, from results for a censored student sample, this is not merely related to passive use values.

The research reported here has begun to explore a theoretical model of human behavior which includes social psychologists' measure of attitudes in explaining WTP. This, and other work, has shown the relevance of ethical positions and connections with information processing, so we can start to see a more complicated behavioral model of human psychology than *homo œconomicus*, and one which is challenging. Yet, there are some obvious ways forward based upon the results here. Aspects of the attitude behavior model, which may reveal more about how individuals value the environment, include subjective norms and exploring the role of specific as opposed to general attitudes. There are then questions as to how the different elements of such a model might interact and the dynamic process of behavior formation. As recognized by classical economists, understanding human behavior requires first understanding the motives to action.

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