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Multiple Value Expression in Contingent Valuation: Economics and Ethics†

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Contingent valuation method (CVM) surveys have become a popular way of placing a monetary value on various aspects of the environment with the aim of determining whether the benefits of a proposed project outweighs the costs. Litigation over natural resource damages has used CVM results as evidence of the size of compensation required. However, despite attempts to set down definitive rules, survey redesign and data manipulation fail to address some key issues raised by CVM studies. Among these is evidence that modified lexicographic preferences, where the substitutability of environmental quality with other commodities is rejected, can be common. Human value formation with respect to the environment combines ethical and economic aspects in a more complex way than most economists have assumed. This paper reports new evidence confirming the influence of ethical beliefs about rights for endangered species in determining willingness to pay (WTP) responses to a CVM survey. One subsample of those holding rights are found to protest against payment, while others bid positively and have a significant impact on WTP. Less than half the total sample held ethical motives in accord with economic theory. Policies and instruments based upon the application of neoclassical utility theory will then be neither optimal nor provide the socially desired outcome.

Introduction

Conventional cost−benefit analysis (CBA) aims to account for the positive and negative consequences of a project by converting them into monetary flows. In doing so, observed market prices are recognized as poor indicators of the social costs and benefits of a project because of a variety of influences such as government intervention (taxes and subsidies), noncompetitive market structures (e.g., monopoly and oligopoly), and the prevalence of externalities. Externalities are costs and benefits that economic agents fail, or are unable, to take into account when making their decisions. For example, species preservation can provide benefits to individuals thousands of miles from the region where the species live and to people who may never visit the site. There is then a positive externality from species preservation because a benefit is created but those responsible for, say, a wildlife sanctuary may be unable to derive any income from those who they benefit. Thus, purely from an economic efficiency perspective, the resources allocated to such wildlife sanctuaries will be economically suboptimal, and too few will be provided. Conversely, negative externalities arise when a cost is imposed on an economic agent without their consent. For example, a firm may make use of the atmosphere or a river system to dispose of waste products at no cost to itself. This will impose costs on others due to environmental damages. Such firms are able to externalize the costs of disposing of their waste products.

The aim of CBA is to take into account all such external costs and benefits when assessing a project proposal. To help achieve this, several tools have been developed over the last 40 years. These tools include the contingent valuation method (CVM), production function analysis, hedonic pricing, and the travel cost method (for a full review, see ref *1*).

The CVM has risen to prominence among these tools. In conception, the approach is simple because it requires going directly to the general public to request their willingness to pay (WTP) or willingness to accept compensation (WTA) for an environmental change. In practice, the method is now expensive and complex to administer due to an increasing number of required practices. The main advantage has been the claim that this is the only method that can assess passive or indirect-use values in addition to direct-use values (e.g., associated with recreational pursuits at a specific location). These indirect-use values are normally associated with maintaining an option to use an asset in the future, bequesting an asset to future generations, and the existence of an asset independent of any direct-use. However, the application of CVM to a wide range of environmental issues and the production of larger numbers than alternative methods has also led to controversy in legal disputes over damage claims.

The most notable case of recent years was the *Exxon Valdez* oil spill. As both the State of Alaska and Exxon argued over the size of the environmental damages, so evidence was sought from CVM studies. This case led the National Oceanic and Atmospheric Administration (NOAA) to commission a panel (including a Nobel Prize-winning economist from each side of the court case) to judge whether CVM was a valid technique for measuring passive-use values associated with natural resource damage assessment. The resulting report both endorsed the method and set down a series of recommendations for conducting a CVM survey that were meant to be definitive (*2*). However, the Exxon case also produced a volume of studies critical of CVM and many of the recommendations of the NOAA panel (*3*).

The NOAA guidelines assumed that survey redesign could avoid all the problems and questions raised by CVM research over the preceding 20 years. However, the report failed to consider all the relevant arguments and was defined within a specifically American context. For example, one key recommendation was to use a referendum (dichotomous choice) format where the respondent is asked whether they would pay $\$X$ and must answer "yes" or "no". As Willis (*4*) has pointed out:

"The NOAA Report failed to consider in detail arguments against the use of referendum formats. There is no definitive evidence that referendum models out-perform open-ended (OE), payment card (PC), and iterative bidding (IB) formats for public goods. There is simply no 24 carat gold standard against which results from different methods can be compared. Further, people in Britain are unfamiliar with voting on tax propositions, compared with people in the USA..." As an experienced CVM practitioner, Willis concluded against the exclusive adoption of referendum formats in Britain.

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There are other areas where the NOAA recommendations are unsatisfactory and open to question. For example, some of the difficulties facing a CVM practitioner are the extent to which budget constraints and substitute goods should be stressed; how framing, choice of bid vehicle, and elicitation method can be decided when opposing parties have an interest in the analysis; and when has adequate information been provided? Also, among their controversial recommendations was the blanket-use of WTP, despite noting that WTA is theoretically required for damage assessment. As Knetsch (*5*) has noted, the NOAA panel argument that "conservative values" are in some sense to be preferred and will be forthcoming under WTP formats is a poor defense and the results are likely to "compromise the valuations and seriously distort incentives" (page 356).

More generally, while the NOAA guidelines did include some sensible suggestions for survey conduct (many recognized good practice), they also neglected a series of questions raised by psychologists among others. These research issues include the following: mapping CVM responses in relation to factors such as equity and ethical considerations in order to understand contingent perceptions of the environment; understanding the processes by which people arrive at their stated intentions to pay or accept payments; and the effect of information provision (*4*). This implies neglect of the social construction of preferences. As Vatn and Bromley (*6*) note: "Societal processes form the context within which individual preferences are both developed and supported. Valuing that fails to recognize the preeminent role of context in preference formation will fail to produce coherent valuation estimates."

The work reported here attempts a broader consideration of the characteristics upon which values are based than that contained in the NOAA Report. The paper proceeds by discussing the previous empirical work showing refusals to trade the environment in environmental valuation work. Hierarchical choice and pluralistic values are then discussed as explanations of the observed results. This is followed by the design of and findings from a recent British study of the relationship between ethical positions and WTP that extends these results.

Beliefs, Rights, and Rejecting Tradeoffs

Economists assume that when an environmental improvement occurs an individual must give up some consumption of other commodities to maintain a constant utility level. This tradeoff gives an individual's WTP for the improvement. Similarly, the minimum quantity of commodities demanded by an individual in exchange for suffering a reduction in environmental quality is their WTA compensation. Individuals are assumed to be able and willing to exchange one bundle of goods for another without affecting their well-being. Thus, monetary valuation requires the definition of environmental changes in terms of commodities. This treats the environment as fundamentally identical to marketed goods and services. Such an approach has been criticized as reducing available information to a single metric, neglecting environmental functions and treating essentially nonseparable environmental properties as easily demarcated independent objects (*6*). The rejection of a single metric raises the plural and incommensurable nature of environmental values (*7*).

Thus, when confronting respondents with a choice of losing environmental quality or paying some money to maintain it, protests against the commodity framing of the environmental issue might be expected on grounds of fundamental disagreement with the approach. There have indeed been several empirical valuation studies where individuals have been found to reject the idea of trading environmental quality and deny the principle of "gross substitution" (*8*−*12*).

An early example is Rowe et al. (*8*), who reported a CVM study where respondents rejected the concept of "being bought off to permit pollution" and slightly over 50% "required infinite compensation or refused to cooperate" (page 9). These results occurred when respondents were being asked their WTA compensation for environmental damages. The choice between WTP or WTA is determined by the reigning property rights. As the NOAA panel noted "The conceptually correct measure of lost passive-use value for environmental damage that has already occurred is the minimum amount of compensation that each affected individual would be willing to accept." They however feared that values under WTA might be strategically biased by high bids and that the type of responses found by Rowe et al. would reappear. Hence, WTP formats were recommended and have become standard.

The argument put forward against WTA is that it can be unbounded and can encourage large bids because there is no income constraint as under WTP. However, the questions in CVM surveys are all hypothetical, so there is no constraint under either WTP or WTA scenarios. If the respondent wishes to act in a truly strategic manner, they can claim to be a millionaire and give a high value for WTP that will appear consistent and rational to the analyst. The main concern must be for a realistic scenario, and this means there are cases where WTA is the correct and appropriate measure. Thus, there appears no good reason to expect, a priori, that WTP will always lead to less controversy, especially where it violates accepted property rights. Furthermore, the attempt to exclude the expression of protests by choosing an unrealistic institutional mechanism will lead to a misrepresentation of the values and that concerns of the general public that the survey is attempting to probe. In fact, all the more recent studies investigating refusals to trade have used a WTP format and still have found protests against treating the environment as a commodity and behavior inconsistent with economic value theory.

Stevens et al. (*9*) used a mail survey employing a dichotomous choice format with an open-ended follow-up to find the WTP of the public for the preservation of bald eagle, wild turkey, coyote, and salmon in the United States. Two random samples were mailed (1000 in Massachusetts and 1500 in New England) with a response rate of 30%. Many respondents ruled out the requested tradeoffs, and 67% wanted as much wildlife as possible preserved regardless of the cost. The authors state (page 398) that "70 percent of all respondents gave answers which appeared inconsistent with either neo-classical economic or lexicographic models of behavior". Respondents agreed with statements denying that monetary valuation was the correct approach or that tradeoffs described their behavior but made positive WTP bids. The authors classified 25% of their CVM respondents as showing lexicographic preferences for the preservation of the selected species. Stevens et al. (*13*) gave three possible explanations for what they regard as clear deviation from economic theory. First, CVM inappropriately accesses citizen values and addresses them as consumer values. Second, natural or Kantian rights are being expressed. Third, ambivalence theory is operative so that choices can be made when extremes are offered (e.g., a large gain in wildlife for a small payment), but individuals are unable to decide over intermediate tradeoffs.

Spash and Hanley (*10*) used an open-ended WTP format to test for environmental rights consistent with lexicographic preferences among students and the general public. Respondents were asked their WTP to prevent an area of ancient woodland in Scotland, where endangered species live, from being logged. Respondents' ethical views on rights were probed. Three separate subsamples were obtained by asking different respondents whether they attributed rights to protection for either animals, plants, or ecosystems regardless

of the cost to society. Reasons for giving a zero bid were also probed. A zero bid with a protest reasoning was seen as representing a behavior consistent with trying to protect rights. Thus, those attributing rights and protesting against the requested payment were classified as behaving consistent with lexicographic preferences. Almost one-fourth (23.2%) of all respondents in the public sample were within this category. This implied that individuals might hold a lexicographic position and value an aspect of the environmental but be falsely classified as attributing no value within a CVM survey.

As in the Stevens et al. study (*13*), other individuals gave a positive WTP but were found to agree with statements contradicting this intended behavior. Approximately three-fourths of the total public sample stated that animals/ecosystems/plants had rights and should be protected irrespective of the costs to society but then gave a positive WTP. Positive bids in association with rights-based positions might be explained as either inconsistent behavior, acceptance of the hypothetical institutional arrangements despite their conflict with desired alternatives, or showing bounded lexicographic preferences (discussed further in the next section). In the last case, the bid would be an invariable lump sum payment as suggested by explanations of giving for moral satisfaction (*14*). The interesting aspect of these positive bids is that plural values were apparently being expressed.

Lockwood (*12*) combined a CVM scenario with an iterative computer program to construct detailed preference maps, building on earlier work (*11*). Paired comparisons were used to obtain the preference map of each respondent and to identify intransitive preferences. The sample (95 respondents) was split into two fairly even subsamples on the basis of different scenarios. The policy context was loss of the endangered Mountain Pygmy-possum from New South Wales, Australia. The cause of loss was linked to the enhanced greenhouse effect, and the prevention strategy was purchasing a new benign vehicle fuel. Lockwood (page 82) notes this to be a somewhat unrealistic scenario. A belief in the rights of possums to existence and protection from harm was significant and positively correlated with WTP, although this model was otherwise statistically weak. Lexicographic preferences were found for 8.5% of the sample, who also bid positively. In addition, other respondents were identified as having "nonexchange" preferences. This meant 24% of the positive WTP bids were classified as falling outside the standard economic model.

Explaining Hierarchical Choices and Plural Values

Rather than trying to remove difficult responses from appearing by survey redesign, we can explore what motivates such individuals. One explanation is that individuals may choose between bundles by ranking their properties, which cannot then be substituted for each other. This type of hierarchical choice behavior denies substitution between goods with superior properties regardless of quantity consumed; preferences then become discontinuous, and standard consumer theory collapses. Neoclassical economists refer to the preferences underlying this type of noncompensatory behavior as lexicographic because absolute priority is given to one attribute over all others, as in a lexicon.

Various authors have reviewed theoretical aspects of such preferences and described their relevance to individual choice (e.g., refs *15*−*18*). This leads to considering situations where people may refuse to make tradeoffs. As a result, rather than the extreme theory of lexicographic preferences (normally described in economic texts) where a good or attribute is always rank best, and no compensation will be accepted for its removal, a more common bounded lexicographic choice model arises.

Modified lexicographic preferences (MLP) are where refusals to accept compensation are bounded. For example, a theory of needs might describe individuals as attaining and maintaining a minimum standard of living prior to showing any concern for protecting other humans, nonhumans, or future generations. Some factors may therefore be traded if the minimum standard of living is threatened. Alternatively, a rank ordering of priorities may be employed. Thus, wants might then be regarded as deriving from needs and be fulfilled sequentially. This lead Georgescu-Roegen (*15*, pages 516−517) to describe universal wants (to avoid thirst and hunger and to obtain leisure and shelter) as taking priority over culturally specific wants. MLP allow for substitution within such categories, although some needs will only be satisfied by a very limited number of goods. An extreme lexicographic preference cannot be ruled out, but more generally the MLP would be observed where the superiority of a good or characteristic is restricted.

Despite these theories, many neoclassical economists regard making tradeoffs as a self-evident universal rule and are generally dismissive of any hierarchical or noncompensatory decision processes. Their defense is summarized as everybody has their price. Lexicographic preferences, when discussed, are only considered in the extreme form where the maximum WTP to prevent the loss of a species would be an individual's entire income and WTA compensation would be infinite. The implication is that few individuals when pushed would be prepared to make such a sacrifice. An assumed rationality is attributed to making tradeoffs, whatever the "commodity", as long as enough compensation is offered in return.

Malinvaud (*19*) claims that neoclassical consumer theory does "not exclude a priori any individual ethical system" and is "philosophically and psychologically neutral". Although, the simple refusal by some individuals to consume certain commodities in defense of ethical principles (e.g., certain religions or vegetarians refusal to eat specific animals) is deemed incomprehensible or irrational behavior. Far from being neutral, modern consumer theory can be seen as having a basis in a philosophy of preference utilitarianism and a restricted model of social psychology based upon individual values.

Environmental philosophers have attempted to raise awareness of the policy relevance of refusals to make tradeoffs on ethical grounds (e.g., refs *7* and *20*). As Holland (*20*, page 22) notes "...to be asked to trade one's principles, even hypothetically, is likely to seem inappropriate and even morally disreputable." Lockwood (*21*) classifies environmental values as including both exchange value and lexicographic preferences. He identifies four categories: a hierarchical decision rule similar to extreme lexicographic preferences; a hierarchical decision rule operating within thresholds, similar to MLP; weak comparability where a choice between alternatives is made without attributing a common value, similar to noncompensatory multicriteria analysis; and commensurability where substitution between alternatives occurs, as in standard economic theory. Lexicographic preferences and MLP are likely to be operative when a good is essential or has a moral or other irreducible form of value (*21*; page 88).

Thus, a species that would be regarded as an environmental commodity in the neoclassical framework may be given moral standing and ranked in an hierarchical manner in comparison with other commodities. Such a position is supported by animal rights groups. Protection of habitat by land designation is also often expressed in terms that deny tradeoffs reflecting intrinsic values (e.g., see ref *22*). Yet empirical research shows that environmental policy makers hide their rights and intrinsic value motives because a utilitarian discourse is regarded as more acceptable (*23*).

The point should be made that incommensurability of values need not imply a hierarchy of values (*24*). That is rejecting the idea that a single comparative term (e.g., money or energy) exists by which all actions can be ranked and measured opens the door to considering a range of alternative decision processes. Different options may still be weakly comparable in the absence of a common unit of measurement across plural values. Martinez-Alier et al. (*24*), for example, recommend noncompensatory multicriteria evaluation where no hierarchy need be implied. Hierarchical values may be sufficient but are not necessary for noncompensability, which only requires that different types of values exist. Thus, even those hostile to an hierarchical approach may accept the relevance of plural values and noncompensatory choices. For example, Beckerman and Pasek (*25*, page 65) feel that a moral intrinsic value of the environment must be rejected but that preservation of the environment "often raises ethical and other motivations that are not commensurate with the values that people place on ordinary marketable goods".

Case Study Design

The research reported here was conducted as part of a European Community funded project (*26*). The survey specifically aimed to address possible shortcomings of previous work and to particularly improve on the study by Spash and Hanley (*10*). Several points can be made in this respect. Their public sample was restricted to central Scotland with in-street interviews, rather than at home, and was relatively small (194 respondents). A small subsample size and lack of variability in responses on rights restricted analysis and prevented identifying the importance of ethical stance in the bid curve. A selection of potential ethical positions could have been offered to individuals rather than concentrating on rights, i.e., allowing explicitly for options consistent with economic theory. If respondents had been probed further about a possible cost for them personally of protecting rights, they might have backed down. Finally, the payment was to prevent environmental degradation (deforestation) while a CVM assessing an environmental improvement might find no link between rights and bids.

An independent market research company was employed to interview 713 respondents at home. A two-stage stratified sampling technique was used, with an even split between local and national populations. The survey was designed in several sections that were delivered to respondents in the following order: framing and knowledge questions, the information pack and payment scenario (open-ended WTP), ethical and attitudinal questions, and socioeconomic data.

An actual proposal to recreate an area of wetland in eastern England formed the basis of the survey. A small site (1 mi^2) currently used for crop farming was hypothesized as being purchased by an existing regional charity concerned with the conservation of wetlands, and a request was made for a one-off payment to a trust fund established specifically for the project. Individuals were effectively being asked to value a marginal change in the supply of a rare ecosystem, i.e., the difference between the common present farming ecosystem and the proposed rare wetland ecosystem. A characterization of the associated change in flora and fauna formed the basis for the evaluation exercise. The information pack consisted of an area map, photographs of an actual site before and after conversion to a wetland, an artist's impressions of the two ecosystems, and brief descriptions. The wetlands and agricultural scenarios were referred to as different potential uses of the area, and the point was made that there was a difference of opinion over which use might be best.

To categorize ethical positions respondents were told that: "A major aim of re-creating wetland is to provide sanctuary for endangered species of birds such as Bewick's swan, the pintail and gadwall." Motives were probed by agreement with one of four statements corresponding to rights for animals, consequentialism favoring either endangered species or humans (in a utilitarian mode), and superiority of humans. Those attributing rights to bird species were confronted with a scenario of a personal cost that reduced their standard of living to what they regarded as a minimum. Under such circumstances, the respondent was asked whether they would still protect the birds' right to life or accept that some bird species may become extinct. The result was the five ethical categories shown in Table 1: two animal rights-based positions, two consequentialist positions, and one human priority position.

TABLE 1. Ethical Categories

	explanation
strong MLP	rights-based favoring endangered species even when personal living standard reduced to a minimum
weak MLP	relinquish rights if threatened with personal cost reducing living standard to a minimum
consequentialist species	endangered species take priority in this case; consistent with utilitarianism
consequentialist humans	humans take priority in this case; consistent with utilitarianism
humans first	humans always first; consistent with a lexicographic preference favoring human superiority

A rights-based position was taken to signify an ethical stance compatible with lexicographic preferences. A strong category of MLP occurs when rights are maintained in the face of personal costs that reduce an individual's living standard to a minimum. This is consistent with an extreme lexicographic preference, but strictly this is only identifiable as a strong MLP. Those who back down when confronted with the personal cost scenario are signifying a threshold effect consistent with a weak category of MLP. This weak versus strong terminology is therefore used in reporting the results.

A MLP position can be hypothesized as consistent with a range of stated behavior in response to a WTP question. The possible range of responses are shown in Table 2. A standard set of reasons are regarded by economists as legitimate explanations for bidding zero, refusing to bid, or not responding, i.e., being too poor, finding the change unimportant, or regarding other things as more important. Data are then required on the reasons for not biding in order to separate "legitimate" nonbidders from what are classified as "protest bids". Most CVM studies fail to make any other distinction between types of nonbidders, although psychologists do recommend categories such as "refusal" and "don't know" be reported and treated as distinct.

In Table 2, judgments are given as to the likely consistency of the MLP positions with a stated intention to pay. Protest nonbidders are consistent with rejecting the monetary valuation of the environment implied by MLP. Those who are too poor are by definition at their minimum living standard and therefore also consistent with the MLP hypothesis. Those who give no bid because they place no value on the environmental change appear to be acting in an inconsistent manner because their attribution of rights implies a positive value. They may, of course, regard the actual scheme proposed as of no value in terms of protecting those rights. This leaves the two positive bid categories.

Positive bids are consistent with the MLP theory if the amount to be paid represents all available resources within a threshold defined by the type of MLP. Under a strong MLP, the individual is prepared to protect rights to the extreme of having their living standard reduced to a subjective minimum.

TABLE 2. Modified Lexicographic Preferences and WTP

WTP	no bid reason	explanation/comment
		Strong MLP
positive bid		consistent with strong MLP if income reduced to minimum living standard; not likely for small environmental change; other possible explanations; WTP inconsistent with economic welfare measures
no bid	protest	consistent with strong MLP; places value on scheme but gives no monetary amount
no bid	too poor	consistent with strong MLP if at minimum living standard
no bid	no value	inconsistent with strong MLP
		Weak MLP
positive bid		consistent with weak MLP if WTP reduces income to threshold
no bid	protest	consistent with weak MLP; places value on scheme but gives no monetary amount
no bid	too poor	consistent with weak MLP if at threshold
no bid	no value	inconsistent with weak MLP

This seems unlikely for a small environmental change, such as proposed in this research, and giving a small amount might then be regarded as inconsistent. However, under strong MLP, the WTP amount would also fail to represent an economic welfare measure. In the case of weak MLP, the payment would have to bring the respondent to their threshold for the category of need being protected. In this case, a small payment is more feasible to regard as consistent. The problem with empirical investigation of both these positive payments with respect to MLP is that the standard of living which defines the threshold is unknown and will vary with cultural context. For example, a car, television, and refrigerator might all be regarded as essential items defining a minimum standard of living in a modern Western economy, but within such societies there are groups who reject some or all of these items. In this respect, the current work makes no claim to definitive explanation of the results but rather aimed to investigate whether plural values that diverged from expectations under economic theory were expressed by the general public.

Results

Ethical categories in accordance with Table 1 were derived. Results as a percentage of the entire sample, including "don't know" answers to the ethical questions, showed 37% attributed rights to birds, 9% put humans first, and only 47% weighed the consequences of the case (in accordance with economic theory). The rights-based respondents were divided by whether they maintained their position in the face of personal costs that reduced their living standard to a minimum. This gave the two categories of strong MLP and weak MLP. In both national and local samples, a larger number maintained their position (strong MLP) than accepted species extinction, and the proportions in each category were similar.

Three categories of people totaling 466 respondents gave no monetary valuation but might hold a positive value for the environmental change. These were zero bidders, refusals, and don't knows. There were 36 respondents who refused to answer the WTP question and 182 who responded "don't know". Approximately one-third of the respondents gave a positive WTP.

Standard reasons regarded as legitimate explanations for bidding zero (e.g., finding the change unimportant) accounted for 286 respondents. Among the remaining 180 nonbidders, 76 held the two rights-based positions of strong and weak MLP. Assuming these are all taken as zero bids for nonzero value reasons, then 11% of the total sample showed behavior consistent with MLP and protested against bidding.

Those who are regarded as legitimate nonbidders for the purposes of a standard CVM study, because they fail to give a suitable protest reason, should be recognized as potentially holding a position consistent with MLP. This applies particularly to those claiming an income constraint. There are 4% of the total sample who do so under weak MLP and 5% who do so under strong MLP.

TABLE 3. Rights Based Respondents

WTP	% of total sample[a]	*N*
	Strong MLP	
positive bid	10	68
no bid: protest	6	41
no bid: too poor	5	31
no bid: no value	1	8
missing	0	2
subtotal	22	150
	Weak MLP	
positive bid	5	35
no bid: protest	5	35
no bid: too poor	4	27
no bid: no value	3	19
subtotal	17	116
total	40	266

[a] Excludes 42 don't know and 4 refuse; final total % does not add due to rounding error.

These results are important because of the way CVM practitioners tend to differentiate their treatment of nonbidders by whether they fall into a protest category. Protest nonbidders may be treated identically to zero bids or they may be given an imputed bid (e.g., the mean WTP of positive bidders). Thus, drawing the boundary line between these categories can be crucial to the resulting WTP estimate when data are aggregated. In addition, either of these standard treatments of protest nonbidders would seem inconsistent with the values being expressed if applied to the MLP respondents.

The full range of positions held by the subsample of rights-based respondents are shown in Table 3. All percentages are reported in terms of the total population sample, excluding 46 item nonresponses. In addition to those classified as MLP who were nonbidders, the table shows that 15% of the total population sample held either strong or weak MLP while they bid positively. Such positive bidding could represent consistent behavior for those with a weak MLP where they contribute a fixed amount that they regard as meeting a threshold. Alternatively, the behavior may be regarded as inconsistent with stating that endangered birds species have the right to protection because a money value is now being placed upon the project to achieve that protection. Either way, the motivation behind the WTP conflicts with being integrated as an exchange price or compensatory payment. In terms of CVM research, the result also implies that greater attention needs to be paid to the motives behind positive bids and not just trying to classify and exclude the protesters among the nonbidders. This is particularly important because

TABLE 4. Regression Analysis of WTP

	coefficient (significance *T*)
SMLP	2.534754 (0.0000)
WMLP	1.176216 (0.0435)
UANIMAL	1.344046 (0.0115)
HUMANS	−1.578690 (0.0207)
ENVKNOW	2.337026 (0.0000)
VISITF	0.331766 (0.0216)
EDU16	−1.060778 (0.0055)
LOCAL	0.860050 (0.0566)
FEMALE	0.638577 (0.0960)
(constant)	−5.876637 (0.0000)
F-test (significance)	16.60 (0.0000)
R^2	0.25
adjusted R^2	0.23
N	458

CVM practitioners tend to accept positive bids at face value, regardless of the motives behind them.

Bid curve analysis showed the significance of all ethical positions, including the consequentialist. Table 4 gives the results for the regression model using a semilog linear function. There were 495 positive and zero bidders in the sample, which is reduced to 458 by item nonresponse. The model combined two sets of variables: standard socioeconomic and ethical.

The socioeconomic factors typically included in CVM surveys for possible use as predictors of WTP are income, age, gender, and education. Older more educated individuals generally have higher incomes so that variables become correlated. Income data often prove unreliable and are difficult to obtain in developing countries or countries such as the United Kingdom where such questions are regarded as an invasion of privacy. In this study, income data indeed proved unreliable due to refusals to answer and underreporting. Any use of the variable significantly reduced the sample size, due to item nonresponse, and therefore education and gender were used as surrogates. Likelihood of visiting the wetland site in the future (VISITF), environmental concern/knowledge (ENVKNOW), and education to 16 years of age (EDU16) all proved highly significant. The impact of being a local (LOCAL) and gender (FEMALE) were significant at the 90% level. The model was significant on the *F*-test and had an adjusted R^2 of 23.5%. This is high for CVM studies where a value of 0.15 has been recommended as an acceptable level (*27*).

As shown in Table 4, all the ethical variables were significant at the 95% level. One of the most highly significant variables was the strong MLP position (SMLP) consistent with lexicographic preferences. Both the variable for utilitarian favoring animals in the case of the wetlands project (UANIMALS) and those who place humans first regardless of the circumstance (HUMANS) were significant at the 98% level. Overall, these results show the importance of ethical motives in explaining responses to CVM surveys. When a model was run excluding the ethical variables, the adjusted R^2 fell to 16.4%, which shows that the ethical variables were comparable with the socioeconomic ones in terms of explaining variability in WTP. Thus, the more comprehensive model improved construct validity. However, the reader must remember that the motives underlying the MLP positions show nonexchange values that cannot can be regarded as commensurate with market prices in a CBA.

There was a positive correlation between the rights positions and WTP and a negative one for those favoring humans. Half those who gave a positive bid were in fact among those attributing rights to endangered bird species and so readily identified their motives with broadly nonconsequentialist reasoning. This extends the concern over the values being derived by the use of CVM surveys from the misclassification of protest bidders, who may hold noncompensatory preferences, to the motives behind and the meanings of the positive bids. The result is that the monetary values obtained fail to represent the exchange prices and welfare changes that economists are trying to derive.

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