

Deliberative Monetary Valuation and the Evidence for a New Value Theory

Clive L. Spash

ABSTRACT. *Economists concerned with validity are combining stated-preference methods with participatory deliberation to address on-going criticism. Deliberative monetary valuation (DMV) uses formal methods of deliberation to express values for environmental change in monetary terms. However, the results have begun to define different realms of value, reflecting pluralism in public concern over environmental change. Reviewing empirical DMV studies evidences a range of issues regarded as external to economics and the validity of its methods, issues which are typically kept at arms length by most environmental economists namely, multiple values, incommensurability and lexicographic preferences, social justice, fairness, and non-human values. (JEL D61, Q51)*

I. INTRODUCTION

Deliberative monetary valuation (DMV) has become an increasingly popular area of research in recent years. This aims to combine stated-preference methods with elements of deliberative processes from political science (Spash 2001). Both contingent valuation method (CVM) and choice experiment approaches to valuing environmental change have been employed in DMV studies. Thus a merge is intended between large-scale, monetary survey techniques and small-scale group deliberation.

The reasons for pursuing this approach seem clear enough to some cost-benefit analysis (CBA) practitioners, and especially those working with stated-preference methods. Not only have such things as focus groups become a common supplementary form of information (Brouwer et al. 1999; Chilton and Hutchinson 1999), but stakeholders are (if the truth be known) also informally introduced into the social process which is monetary evaluation and assess-

ment (e.g., Niemeyer and Spash 2001). Formalizing inclusions of deliberation has also been seen as a method of addressing the combined issues of preference construction and lack of knowledge (e.g., Álvarez-Farizo and Hanley 2006). Deliberative sessions are then hoped to increase the validity of the resulting numbers by addressing criticisms that people do not have prior preferences over most complex environmental problems, and may often have extremely poor understanding of the issues. This seems reasonable given that even the more highly educated in the population appear to find concepts such as biodiversity hard to explain (Spash and Hanley 1995). If deliberative processes can achieve preference formation in the political context, then why not in an economic one?

There might also be other advantages. Participatory planning and policy analysis have received increasing attention as tools of governance due to three types of benefits: (1) the substantive: improvement of the knowledge base; (2) the instrumental: increased likelihood of stakeholder compliance and support; and (3) the normative: strengthening of the democratic legitimacy of public policies (Pelletier et al. 1999). Participation and deliberation leading to monetary valuation is then hoped to increase “buy-in” to the outcome, so encouraging formalization of the structure of inclusion. However, the results may not be those desired by CBA economists (or others following monism) because structured approaches to stakeholder participation show multiple complimen-

The author is a research professor in the Sustainable Ecosystems Division of the Commonwealth Scientific and Industrial Research Organisation, (CSIRO), Canberra, Australia, where he holds the post of Chief Executive Officer's Science Leader. Further information can be found at his personal Web site, www.clivespash.org.

tary value systems are expressed via discursive engagement (Kontogianni et al. 2001).

Indeed, the conception of a social process of valuation under the heading “participation” seems somewhat at odds with the role being advocated for environmental monetary valuation as part of CBA and ecosystems valuation. In the latter contexts, the utilitarian calculations and technical analysis are the process, so the role political scientist have described for public deliberation seems to strongly diverge from the economic requirement. Indeed, this was the type of conclusion reached as part of the European project named VALSE (O’Connor et al. 1998; O’Connor 2000; Aguilera-Klink and Sánchez García 2002), which raised many issues about how society should proceed in better understanding environmental values. One part of that project was the exploration of citizens’ juries (Aldred and Jacobs 1997, 2000) and the simultaneous evaluation of the same environmental change using the CVM (Spash 1998, 2000), in order to provide cross-comparison (O’Neill and Spash 1998, 2000). The original aim had been to test how group deliberation affected individual willingness-to-pay (WTP), but the two approaches were in the end treated separately because the open outcomes of the citizen’s jury were felt to be so far removed from the closed expert framing of the CVM. The potential for combining approaches in a DMV process, where participatory approaches are used to produce a shadow price as the outcome, appeared at best limited if not internally contradictory, with value outcomes hard to frame or interpret in any meaningful sense (Niemeyer and Spash 2001; Spash 2001; Aldred 2005).¹

This conclusion now seems premature, or at least in need of further clarification, because of the continued interest in DMV. Driven by the continued need to improve the validity of stated-preference approaches, in the light of persistent criticism, a growing number of economic researchers have actually combined aspects of political deliberation and social learning in order to produce a monetary value. The latest literature in this area can be split into the largely descriptive case study applications which generally contain limited reflection upon theory (Gregory and Wellman 2001; Macmillan et al. 2002; James and Blamey 2005; Álvarez-Farizo and Hanley 2006; Macmillan, Hanley, and Lienhoop 2006; Urama and Hodge 2006; Lienhoop and MacMillan 2007a, 2007b), and the specifically theoretical and methodological analyses (Niemeyer and Spash 2001; Spash 2001; Wilson and Howarth 2002; Aldred 2005; Howarth and Wilson 2006). This adds to an earlier theoretical literature related to DMV (e.g., studies cited in footnote 1 plus Brown, Peterson, and Tonn 1995; Sagoff 1998; Ward 1999). In light of this recent work, I reappraise the potential for combining small group deliberation with stated-preference techniques in order to obtain environmental values and investigate what has actually been coming out of these studies. I will show that empirical studies are unintentionally raising issues about the meaning of social and communal values. I draw out some key aspects of DMV, and discuss whether economists implementing DMV approaches are actually validating stated-preference methods or unintentionally providing empirical evidence for a new theory of value.

II. THEORETICAL ADVOCATES OF DMV

The standard theoretical suggestion for a DMV is a jury-type process either legally constituted (Brown, Peterson, and Tonn 1995), or based upon a political model (Sagoff 1998; Ward 1999). The latter links directly to the literature on citizens’ juries as a formal process with a supporting litera-

¹ During the 1990s, the idea of deliberation in a monetary valuation setting was discussed by researchers in Australia (Blamey 1994, 1996; Blamey and James 1999; Blamey et al. 2000), and in a series workshops at Lancaster University, United Kingdom. The latter led to an edited volume of which the chapter by Jacobs (1997) is usually cited in the DMV context, but also of note from this period is Holland (1997). Some cross fertilization and exchange between various researchers from Australia and the United Kingdom also took place throughout the 1990s.

ture in political science (e.g., Crosby 1995). The citizens' jury approach is described as having several advantages that could be transferred to a DMV process, including: open access to information, calling and questioning of witnesses, potential to address non-human interests and other silent voices such as those of future generations, direct debate over distribution, and fairness and equity issues. Wilson and Howarth (2002, 435) directly link DMV with Rawls and Habermas and define social fairness as "a deliberative forum that: (a) protects participants from uncompensated harms; and (b) ensures that participants have a common set of rights or capabilities."

DMV is seen as a social process of valuation because it engages individuals as representative of social groups (Spash 2007). Standard economic approaches rely upon statistical representation and random selection, although in practice quota and convenience samples are more common. Small group deliberation often explicitly engages in representing vested interests or stakeholders. This diverges from getting a socially representative group of citizens to take a long-term, informed and impartial view. Ward (1999, 76) argues that the "opinions and perceived interests" of the population should be represented and not agency. Indeed, he sees social representation as involving the avoidance of "the pattern in everyday politics whereby well-organised and resourced groups get a disproportionate say" (Ward 1999, 83). Brown, Peterson, and Tonn (1995) also wish to avoid undue influence by vested interests and recommend a *de jure* jury selection process to achieve deliberation as to the common good.

The general aim of the DMV process is for a group consensus over the aggregate social value of an environmental change and in the absence of consensus majority voting is noted as acceptable (Brown, Peterson, and Tonn 1995; Ward 1999; Wilson and Howarth 2002; Howarth and Wilson 2006). Only Sagoff (1998) diverges from this aim in that he proposes three alternative forms of outcome: (1) a social

WTP expressed as an individual opinion, (2) a group decision as to the "value or price" which is paid by individuals, and (3) an individual WTP framed as a fair share, which might best be described as a charitable contribution. Unfortunately the interrelationship and role of these three different measures is left very unclear, especially with regard to how they might relate to existing value theory in economics and numbers used in CBA, and indeed there is some hint that they might be incommensurable (Sagoff 1998, 226). For other advocates of DMV, the aim appears to be to avoid aggregation issues by aiming for an already aggregated social willingness-to-pay/willingness-to-accept (WTP/WTA) outcome (only achieved by Sagoff's first option).

Seeking consensus, as part of DMV, is a debateable goal. For example, this seems rather at odds with the claim that "ultimate success depends not on unanimity or collective action among all citizens, but on the formalization of procedures and conditions for achieving free and fair deliberation between them." (Wilson and Howarth 2002, 435). As Holland (1999, 286) explains: "Conflict and distrust, it may be argued, are in fact vital for a healthy democracy. It is true that there have to be ways of taking decisions. But it is not obvious that this requires there to be consensus over values. Indeed, the notion of a consensus over values is arguably an oxymoron. Values are nothing if they do not involve commitment. And commitments are nothing if they are given up in contexts of 'facilitation'." Ward (1999, 84) expresses the same concern noting that a drive for consensus can be coercive and that failure to achieve consensus can be a socially important fact. In an idealized democratic setting the interplay of pluralistic values in a social setting takes place via open deliberation, between individuals and social groups, without coercion.

Accepting that different participants will have different conceptions of what constitutes "good" means that focussing the process on a money metric may also prove problematic. Ward (1999) sees deliberation explicitly addressing concerns over distri-

butional weighting and discounting in order to produce the social value. Thus, open DMV discussion is recognized as unlikely to focus solely on economic efficiency and instead would be expected to introduce a range of concerns, such as those over fair distribution (Howarth and Wilson 2006). This means allowing for alternative values to be expressed, not aiming for a simple single figure, and including reports on a variety of mitigating facts and problems. Indeed exposing value conflicts and different basis for moral choice is seen as a positive advantage of the approach. As Ward (1999, 84) states: "Conventional methods of contingent evaluation actually hide such differences by implicitly assuming all individuals buy into a quasi-utilitarian ethic. Where this is not the case, it is important that this is recognised." He goes on to note that a DMV approach might also offer alternatives to monetary measures and consider whether the policy framing is right in a deontological sense. This potential pluralism is also recognized in identifying DMV as providing an interactive setting which can mimic some of the social processes in which humans value the environment. In contrast, stated-preference methods are noted to involve little or no meaningful social interaction (Ward 1999, 87).

Interaction with others and new information are expected to change individuals' judgments about their interests and actions. Recognizing that manipulation is a present and on-going state of affairs in modern society implies a need for processes which remove such distortion and allowing people to break free and apply some corrective reflection (Niemeyer 2005, 348). To this end, some facilitation is noted as necessary in-line with accepted citizens' jury practice. For example, preventing articulate, well-educated people from dominating proceedings (Ward 1999, 80), while encouraging the less articulate to address the "willingness to say" problem. However, this does not extend to closing down areas of debate or excluding non-economic values. The expectation from political theory is that deliber-

ation will allow individuals to look beyond immediate self-interest and toward the common good (Niemeyer 2004).

This has also been extended to a moralising effect which can enfranchise Nature and allow representation of others (including non-humans). Representation of silent voices such as those of non-humans and future generations remains a problematic issue in all processes of environmental valuation, due to the lack of authorization, accountability, and presence (O'Neill 2001). Reliance may therefore be placed upon legitimacy to speak for silent voices due to the knowledge, expertise, or judgment of the representatives and their reflection of this in caring for the interests and aspirations of the silent ones (O'Neill 2001). This could be achieved by calling witnesses rather than relying entirely on emergent properties.

There seems some clear agreement amongst those advocating DMV that it should be a social process involving formal elements of political processes. This is most commonly referred to as the citizens' jury format, but the more general point is small group deliberation for the common good. While advocates highlight the importance of the monetary outcome they also tend to raise issues of pluralism, openness, fairness, and free debate.

III. A REVIEW OF DMV STUDIES IN PRACTICE

The preceding section has outlined how DMV is described in theory by both economists and others. This shows that there are four approaches to DMV which have been put forward. Table 1, following Spash (2007), shows how the propositions can be split by the objective being either an individual or social value, and the means of articulating that value being based upon group or individual choice. Including those proposing each approach clearly shows the theoretical bias towards a social WTP/WTA value derived by group arbitration. In this section, I critically review the empirical studies as they match the quadrants of Table 1.

TABLE 1
FORMS OF VALUE EXPRESSION IN DMV

Value Provider	Terms in Which WTP Specified	
	Individual (Disaggregated Value)	Social (Aggregated Value)
Individual in a group setting	Charitable contribution (Sagoff 1998)	Expressed social WTP/WTA (Sagoff 1998)
Group	Fair price (Sagoff 1998)	Arbitrated social WTP/WTA (Brown, Peterson, and Tonn 1995; Ward 1999; Wilson and Howarth 2002; Howarth and Wilson 2006)

Individual WTP and WTA in a Social Context

In contrast to seeking a general social WTP, there have been a series of studies which have used the group process for some discussion and possibly social learning and then reverted to an individual payment (Macmillan et al. 2002; Kenyon and Hanley 2005; Macmillan, Hanley, and Lienhoop 2006; Urama and Hodge 2006; Lienhoop and MacMillan 2007a, 2007b). This can be regarded as individual decision-making in a group context. The outcome is meant to be an individual exchange value equivalent to having undergone a process of arbitrage. However, the processes used and results seem highly variable and, as will be demonstrated, the values arising appear best classified as charitable contributions.

Macmillan et al. (2002) aim to produce an individual WTP for goose conservation in Scotland which has improved validity due to allowing more time for discussion and reflection. They conceptualize the valuation process as one where individuals “research their underlying preferences, form and then state a WTP value” (Macmillan et al. 2002, 50). The DMV sessions consist of two one-hour meetings separated by one week, during which free thought on the environmental trade-off is supposed to be noted in diaries.² What happened at the second meeting is very unclear as some

people are noted not to have returned, but also WTP bids are mentioned to have been obtained by phone and in the post?

The approach is mentioned as combining citizens’ juries with the CVM, but seems to have little formal connection to the jury method. The DMV in this case is more akin to a test, re-test experiment on a CVM. The sample is selected on the same basis as for a CVM survey and a payment card is used, which obviously bounds the decision. A comparison with a standard CVM approach is argued to show a largely inexplicable decrease in WTP due to the week gap. While the conclusions make passing reference to the importance of moderators and the need for managing the group process, there is no description of any process or procedures of conduct for debate.

There are two aspects of this study which are of interest. First, the bid curve analysis shows that WTP under the standard CVM (adjusted R^2 0.17, $N = 51$) only relates to one variable, which is a general attitude to wildlife protection. There are no standard socio-economic variables such as education, gender, or income. The WTP result after a week (adjusted R^2 0.36, $N = 50$) has three other variables of which one is a more specific attitudinal variable relating to geese, one a dummy on environmental group membership, and the third household size (the most significant variable by far). This suggests the result is strongly related to attitudes which may be ameliorate by an implicit variable (e.g., budget, number of children?) reflected in household size.

The second point of interest has more to do with the expectations of the researchers

² Largely the benefits of the approach seem to be that individuals could go away and follow their own informal procedures or none at all. There is some reference to family discussion and people going to libraries being important without scientific data or evidence (e.g., the number of people this affected, how, to what extent).

than the DMV itself. The authors are positively concerned to remove any bids based upon fairness, describing this as strategic behavior. As they state: “participants may use additional time and information to calculate a ‘fair’ donation rather than their maximum WTP,” and “appropriate checks and protocols to minimize the risk of it occurring are essential” (Macmillan et al. 2002, 57). Indeed there is a role here for the moderator “to be proactive and encourage the discussion along appropriate lines, for example by countering any tendencies toward ‘strategising’ but without unduly influencing the WTP of participants for the project” (Macmillan et al. 2002, 57). Of course within the context of the neoclassical model and welfare economics, the authors are correct, they want a trade-price not an attitude or a charitable contribution, but this seems to conflict with placing individuals in a group setting.

Kenyon and Hanley (2005) are concerned with the empirical application and comparison of citizens juries, CVM and DMV to the Ettrick Forest Floodplain Restoration Project in Scotland. The arguments are firmly based within an economic process model with, for example, citizens’ juries described as addressing “the information problem better than the CVM.” That is, their concern is with addressing the fact that preferences are formed and not merely informed during a valuation process and any information set is never “neutral” (see Spash 2002). The reason Kenyon and Hanley (2005, 211) give for pursuing DMV is because citizens’ juries “do not provide an economic estimate of the value of any particular project, nor whether it constitutes an efficient use of resources.” For the CVM a stratified sample of nine towns results in 336 responses to the survey including the request for a charitable donation. Of these 29% are classified as protest bids and removed from the data set and any further analysis. For the citizens’ jury, participants were a sub-sample of the CVM respondents. Kenyon and Hanley (2005, 214) claim that the eleven jurors were selected “to be representative of the Borders

population,” although how so is unspecified. The jury considered environmental and social elements in judging the success of the project and in making management recommendations, but “they did not seem to consider economic criteria important.”

Kenyon and Hanley (2005) selected the sample for the DMV on the basis of responses to a letter sent to 500 households. Two workshops were carried out in each of two towns in the Borders, giving a total of four workshops and 44 participants. The DMV starts by administering the CVM, then takes participants into small group (5–7 people) discussion on problems and management options, and finally asks them as individuals to answer some questions including whether they now want to revise their WTP (14% do so). Initial DMV bids include 5% protests and 34% “don’t know” responses, and only two people are found to move from the latter after the discussion stage. Failure to clearly define protest bid classification is an issue, as with other studies.³ An advantage of the DMV over the CVM is seen to be information gained on positive and negative views of the project. When an aggregated WTP figure is presented back to the DMV participants there are three responses: the impossibility of putting a value on such a project, the poor economic situation meaning the need to spend money elsewhere, and wanting some other public fund to pay. Overall, the authors conclude in favor of DMV as a middle path, although given these public responses a question remains as to the advantages for validating economic valuation and stated-preference methods.

Macmillan, Hanley, and Lienhoop (2006) conduct two CVM surveys for comparison with a DMV in a rather complex design. The first CVM delivers a WTP survey by mail and then later re-tests by phone (two

³ The definition of protest responses is absent from the study. The authors note a question allowed protest bids to be identified. Later they state that the most common protest reason was that the government, the lottery or some other body should pay. They go on to state that those respondents who did not provide a reason for bidding zero were classified as protesters.

WTP results), the second does the same, but adds more information and a second mail survey before the phone survey (three WTP results). The DMV approach consists of two small group meetings, each involving individual in-person survey responses, and then a final phone survey (three WTP results). So in all, eight WTP amounts are obtained across three sub-samples. The process is run for two goods in separate samples (giving 16 WTP results): green electricity (wind power) and increasing the numbers of a rare bird (Red Kite) in the wild. Design is further complicated by including negative information prior to the last phone survey, and WTP and WTA on the same payment card.

A sample of 165 is reported for each good, which drops over the re-tests to 133 and 128 for bird species and wind power, respectively. Selection is described in rather loose terms as being from the largest regional employer in Aberdeen (i.e., the University?) and on grounds of “economic status” which is elaborated with four variables but then states a fifth “etc.” (Macmillan, Hanley, and Lienhoop 2006, 300). Each sample for each CVM and the DMV approach are then stated to be “similar with respect to these characteristics” (Macmillan, Hanley, and Lienhoop 2006, 300), although why this is required and why for these characteristics is not clarified. Indeed when finding WTP varied significantly between the two initial CVM mail samples the authors “cannot explain this result” (Macmillan, Hanley, and Lienhoop 2006, 303).

The study is really too ambitious and suffers from too much uncontrolled variation across the sub-samples which are also too small for standard parametric statistical analysis. Uncontrolled variation enters because of group drop-out affecting the socio-economic representation stated as needed. The DMV group dynamic can be expected to have changed as there were eight groups among 60 people to start and only 49 and 50 people for each good at the end. Presumably there was variation in drop-out making some groups very small? The time between WTP responses was uncontrolled for the

two CVM samples as it relied upon mail surveys, and in the first case there was no middle survey so the re-test period varied by design. In the DMV information was taken home so there is no idea of intervening factors, which is recognized in part by a follow-up “telephone de-briefing exercise” to gather more information (Macmillan, Hanley, and Lienhoop 2006, 305). The issue of protesting is mentioned only briefly as being low, the same for all approaches and goods and relating primarily to bid vehicles (although these were different for the two goods?). Protestors are then aggregated into a “non-completion” category, who “were identified and excluded” (Macmillan, Hanley, and Lienhoop 2006, 303).

Although touching on issues of preference formation, the authors focus on preferences as needing to be better informed and therefore try to design variations in information into the applications to test for impacts on WTP. Respondents are regarded as needing time to “fully research their preferences” (Macmillan, Hanley, and Lienhoop 2006, 299), rather than construct them. The DMV approach allows “information and discussion” which is “moderated.”⁴ This is stated to “generate more valid estimates of WTP” (Macmillan, Hanley, and Lienhoop 2006, 300). Yet there seems little sign of impact on WTP as they state for both goods under DMV there is a strong correlation between initial and final WTP. The main activity for the group meetings is the “opportunity to ask further questions and to discuss any unresolved issues concerning the project.” The main conclusion seems to be that “discussion and deliberation tends to stimulate demand for information and knowledge” (Macmillan, Hanley, and Lienhoop 2006, 305).

In analyzing the 16 WTP results using regression models only two proved significant. Poor statistical results do not prevent the authors claiming more information increases preference uncertainty and reduces

⁴ The group deliberations are stated to be “moderated by experienced CV moderators” (Macmillan, Hanley, and Lienhoop 2006, 301–2), which is strange as CVM is usually not moderated at all?

“validity of WTP responses,” although two paragraphs later they do note that “overall the evidence relating to the role of information is ambiguous” (Macmillan, Hanley, and Lienhoop 2006, 306). Despite all this, DMV is recommended for “less familiar goods” as a process where “benefit estimates should be generated using deliberative methods that allow participants to think and consider, gather and understand relevant information, and to discuss all facets of the valuation exercise in moderated groups” (Macmillan, Hanley, and Lienhoop 2006, 306).

Urama and Hodge (2006) conduct an exercise that has aspects of a DMV (they cite use of “participatory workshops”), although very close to a normal CVM, and so show how deliberative rhetoric is being employed in valuation. A normal CVM survey is administered and then six months later, the same 108 people are surveyed again after completing five one-hour “education sessions” over five days. The aim is to “enable individuals to form coherent and consistent values” by providing them with “adequate information” (Urama and Hodge 2006, 543). Participatory events are stated to be used as a “social learning tool.” Although they recognize something of the deliberative ideal in noting that “participation develops individuals’ attitudes and values” through sharing of “knowledge, beliefs and attitudes” (Urama and Hodge 2006, 546). The participation sessions are tightly focussed upon a set of consequential relationships connecting irrigation schemes with soil fertility decline, water pollution, health risks, and biodiversity loss. One-hour long sessions on each of these aspects conclude with one summarizing all the impacts. Having basically reinforced the reasons for needing to take action for five consecutive days, the authors note, with some satisfaction, that participant assessment of the severity of impacts increased along with WTP, although the more highly educated seem less easy to persuade. This is of course quite removed from free association in a deliberative forum without coercion, which is presumably why the authors refer to the process as “education.”

The best regression model explains 29% of variation in WTP, improved from 21%, so the authors have managed to get people to be more focussed on their six-variable model. However, this does little to convince that the WTP values are economically driven and not charitable donations to the trust fund bid vehicle based upon non-economic motives. The authors note that typical trade prices in Nigeria are negotiated, so they use an iterative bidding game, but in a footnote they also note that 67% and 44% of the first and second CVM samples, respectively, give only one bid, that is, do not negotiate.

Refusals to trade also arise. Originally, 10% express ethical concerns stated to reflect lexicographic preferences. The “education” process manages to convince most of these respondents to revise their preferences “in the light of improved understanding obtained during the participatory workshops” (Urama and Hodge 2006, 552). There is then a logical leap to concluding that the original positions are “based on poor cognitive understanding of the trade-offs involved” (Urama and Hodge 2006, 558) and therefore somehow illegitimate, weak and need removing.

Lienhoop and MacMillan (2007a, 2007b) present a case study using CVM and DMV in Iceland to look at dam construction in a wilderness area. As in Macmillan, Hanley, and Lienhoop (2006), a payment card with both WTP and WTA is employed, however, here is followed by an open-ended question. In Lienhoop and MacMillan (2007a), considerable attention is focussed upon the fact that WTA is a credible alternative to WTP and indeed the correct welfare measure.⁵ These articles also give more careful explanation of the process. Participants are paid (20–25 euros) for the group meeting. There are 7–12 participants in each group. The moderator directs the main discussion at provision of the environmental change. The authors note that “the informal and relaxed relationship between the moderator and participants also seemed to create trust”

⁵ This is a point Knetsch (1994, 2005) has been at pains to explain for some time.

(Lienhoop and MacMillan 2007a, 294). Participants are given information to take home with the directive to read and discuss with others. A week later they are phoned and asked to bid again. The aim is to obtain from DMV “thoughtful and informed economic trade-offs” to improve CVM “validity and accuracy.”

The amount of information and time are stated to have been kept constant, to test for discussion effects, but how so is unclear because the DMV is noted as having a variable time of one- to one-and-one-half hours, and CVM surveys in the field cannot be controlled for time. Also, this implies the participants bring no information to the process, which rather conflicts with the concept of deliberative forums. Indeed, the possibility is mentioned of DMV explicitly investigating issues relating to future generations and wealth distribution, which alludes to the political ideal of emerging group information and values leading to transformative experiences in deliberation (e.g., preference construction).

The role of the moderator is given a little more insight in Lienhoop and MacMillan (2007b). The presence of dominant participants is seen as a problem which they are there to control. The moderator should prevent “biased attitudes and hence biased WTP or WTA.” Indeed “an experienced moderator should be able to eliminate such effects by discrediting incorrect arguments.” Although, the authors note some of these influences “cannot be controlled.” Thus, a key role of the moderator seems to be to control the information coming from group members and to make them conform to an unspecified behavioral model.

The DMV had 53 participants selected by a variety of methods, while the CVM was a very small ($N = 62$) convenience sample from airport lounges and public parks. Once sub-samples are split out, the regression analysis can only be run on WTA under the CVM and the model proves insignificant, but this does not prevent the authors drawing inferences (Lienhoop and MacMillan 2007b). In Lienhoop and MacMillan (2007b), the process of DMV is

claimed to be superior to CVM due to better participant engagement. Motivation is monitored on the basis of incidents of disengagement (e.g., answering a mobile phone call), and basically DMV participants are found to be more engaged. This is explained as due to the attendance payment, and the moderator creating trust and reinforcing the importance of participants views (Lienhoop and MacMillan 2007b).

An interesting aspect of the work is the occurrence of “infinite values.” In the DMV sample, five people switched to infinite values from a WTA (one from being unsure) after the week break (note exact sub-sample size is unclear but this appears to be 20%–25% of the WTA group). This rather confounds the standard explanations mentioned such as lack of time to think. Indeed, the authors note that the DMV approach used should have enabled people to “tackle the trade-off” but instead “the number of participants with lexicographic motives increased” (Lienhoop and MacMillan 2007a, 294). This is rather left hanging in the air because the authors prior belief is that protest responses are those failing to reflect “genuine valuations” (Lienhoop and MacMillan 2007b). Thus, the authors’ conception of true WTP/WTA based upon the divergence of stated from revealed WTP/WTA fails to aid in understanding motives and non-economic values.

From Individual to Group Estimates of Individual WTP

The preceding studies all aimed to validate a standard individual WTP or WTA by putting respondents through some form of group process. An alternative is to put respondents through this process, but rather than ask for a response as individuals, to ask for the group to make a decision as to what an individual should pay or accept. Depending upon the exact group process, this might be regarded as resulting in a decision as to the fair price which should be set. Only one study was found to have attempted this approach.

Álvarez-Farizo and Hanley (2006) build closely upon the study by Macmillan et al. (2002) of which they were co-authors, but go beyond this by producing a group valuation rather than stopping at an individual valuation. The DMV approach here is more carefully detailed and the extended group sessions appear more closely modelled upon a discursive political model, which again is claimed to be a citizens' jury. The value elicitation procedure is not a CVM approach, but rather similar to that of Gregory and Wellman (2001), that is, a choice modelling variant.⁶ A main stated-preference survey is conducted first and then two groups of twelve are selected for the DMV exercise. So this sub-sample already has prior experience of the valuation exercise before even the first information session.

The DMV groups go through three separate sessions with 3–4 day gaps between them. Session 1 is noted as identical to that of Macmillan et al. (2002) and here specifies use of a moderator. The objective is to have individual respondents make choices from a self-interested perspective. In Session 2, ideas of good and fair ecological and economic states are discussed and the choices are framed as “on behalf of the community, defined as present and future generations sharing the same local environment,” but with choices still made “by each individual separately and confidentially” (Álvarez-Farizo and Hanley 2006, 469). Session 3 frames choices as being collective and made by the group, rather than individual, with a decision rule of majority voting on choices subject to “not making any jury member unhappy” (Álvarez-Farizo and Hanley 2006, 469). The stated-preference survey is as before and therefore Session 3 represents an individual choice setting being made by the group.

⁶ In such approaches objects are not valued directly or explicitly but rather implicitly via the inclusion of a cost amongst several attributes shown together. Individuals then choose repeatedly between pairs of these attribute sets. Statistical techniques are then employed to extract implied valuations.

The DMV groups are claimed to be representative of the general population on the basis of some criteria of which membership of environmental groups, income, and age are mentioned. In what way these 24 people are “representative” is unclear. There is a desire on the authors' part for statistical representation which is mitigated by the sample size. However, the authors repeat a paragraph from Macmillan et al. (2002, 51), which claims that under deliberative approaches participants have some “symbolic representative” role (Álvarez-Farizo and Hanley 2006, 466–467). What this might be is never defined or pursued. In the conclusions they are clearly more concerned about statistical representation as they bemoan the small sample size as a “major problem” (Álvarez-Farizo and Hanley 2006, 475).

In the analysis of the results there are six attitude type scales based upon some 35 items. Unfortunately, there is no explanation of scale constructs or reporting of their statistical independence or reliability. The clearest are three on environmental water quality and its consequences, while the most confused try to combine beliefs about industry, government, and pollution so that what they measure is most unclear. Having said this, the attempt is better than most found in stated-preference studies (e.g., membership of environmental groups is often claimed to be an attitude measure?). The general point seems to be that stated preferences can be shown to be related to attitudes, even when the measures may not be to the standard of those in social psychology (from whence the concept as measurable arises, see Spash 2006).

The main result is reported in terms of how the outcomes from different framings (sessions and main survey) compare. The choice model parameters prove different across framings except in the case of the requests in Sessions 2 and 3, which emphasize fairness and community and in the latter case are negotiated group values. The attribute values (part-worth) of the choices are reported in a table showing how the

money values changed,⁷ but interestingly this is discussed in terms of ordinal rankings. One thing to note is that Session 2 could not be reported in this way because the cost element proved insignificant; so the choices are not dependent upon cost (perhaps equating to charitable giving in CVM). The remaining result shows a dramatic ranking switch where the two individualistic approaches (main survey and Session 1), have some similarity while the socially negotiated choice (Session 3) proved entirely different. Most notably the improvement of water ecology to the highest level is elevated to the most important priority having been fifth in the other framings.

The authors have little to offer in terms of explanation. They also are somewhat perplexed as to how the results can be employed. Their implicit price approach via choice modelling focuses upon individual values chosen by the group. Thus, there is no aggregate and no clear way in which to reach one given that the values being articulated are not standard WTP amounts relating to neoclassical welfare theory. The authors are aware of having changed preferences and values (as implicit prices), but seem less aware of preference construction via institutional design or the varying value concepts and motives with which they are playing.

Individual and Group Determination of Social WTP

A different approach to DMV seeks a social WTP in line with the thrust of the theoretical literature. Social WTP is an already aggregated value, which can be expressed either by an individual (Gregory and Wellman 2001), or a group (James and Blamey 2005). This approach also moves well away from the attempts to validate an

individual monetary valuation within a standard economic framework.

Gregory and Wellman (2001) present a carefully designed and conducted study on management options for Tillamook Bay, Oregon. Critical but controversial ecosystem management actions are identified via detailed "value-elicitation sessions" held with stakeholders prior to small group (8–12 people) stakeholder sessions for obtaining social WTP. The authors chose social WTP for three reasons: (1) they regard standard CVM results as producing measures of attitudes not economic value; (2) they cite the public good aspect of their case study as likely to lead to charitable contributions if a standard WTP question is asked; and (3) they believe social WTP better reflects opportunity costs, that is, the trade-off with other publicly funded projects. The authors note that a variety of metrics are best with some cases being suited to monetary expression, but, because this tends to reduce the quality of information, in other cases environmental values are best reported directly in terms of trade-offs across options or in terms of preference ranking.

The monetary value elicitation is achieved by a form of choice experiment giving a stated-preference by individual participants. Three actions were presented to participants in terms of two alternative plans for each. The plans involved three benefit attributes and two cost attributes. A matrix was used to present the anticipated trade-offs, with one level of costs and benefits held constant across two choice tasks. The process was designed to sequence choice tasks so as to seem natural and familiar to participants, while also following cognitive rules of good decision-making. First, participants made choices among policy alternatives for the three key actions (limiting livestock access to streams, protecting tidal wetlands, and upgrading forest management roads). Second, one of the three actions was selected (with variation among participants) for eliciting trade-offs across an action's objectives to refine estimates of economic costs and benefits.

⁷ As noted by a referee, the number of participants for the juries is absent from the paper but if very small this could influence the results of maximum-likelihood estimations. From a parametric statistical viewpoint the result might then fail to be robust enough to draw strong conclusions about individual's preferences and values.

However, the authors emphasise the ability of the small group sessions to produce information on distributional consequences, to communicate information on complex problems, and that their approach reflects a decision and trade-off focus, rather than a number focus. In addition, failure by individuals to complete certain valuation tasks is more easily identified as linked to controversial aspects of specific options.

There were 89 participants with 79 surveys completed and five sub-sample splits for different management options/issues. This prevents statistically representative sample analysis. Results are reported in terms of what the majority of a group decide is the social WTP within a relatively wide margin and how this is subject to change with options. The authors argue, persuasively, that avoiding over precision (as gained from standard stated-preference approaches) is best given the available knowledge base and uncertainty. A key contribution is to identify that a majority of stakeholders support specific actions within a given price range. In addition, the approach is noted to have achieved its goals of encouraging public involvement and community participation. This is more than an academic research exercise as the project clearly linked into an on-going decision process about natural resource management in the region, with the study's conduct and outcomes having real consequences.

James and Blamey (2005) concentrate on a DMV approach, which they describe as a citizens' jury with the added task of determining societal WTP for a specified program involving environmental improvement. They open by addressing problems and issues relating to the theory and application of both the CVM and deliberative approaches in order to support the need for a DMV approach. The empirical case study is the management of national parks in New South Wales (NSW), Australia. There is a concern that the participants be representative on the basis of gender, age, place of residence, ranking of the environment in relation to other social

issues, occupation, income, income source, and education. There were 13 participants (and one no-show).

The DMV panel was given three options developed by the researchers and a fourth developed on the basis of answers given to a "straw preference poll" (although what this involved is unclear). Participants were limited to considering only these options. After individual participant consideration of the three researcher options, the panel was convened and the choices discussed. The aim of the researchers was for a consensus report and the panel gave a preferred option with qualifications covering the concerns of those who were initially against that option. Next, the valuation question was introduced as part of the fourth option.

The task for the panel was to determine how high a park "levy" would have to be before the NSW public would be no better off than under the status quo. That is, they were being asked to set an aggregate annual income tax for NSW, rather than their own maximum WTP as in a CVM survey. The panel produced two amounts and voted to decide which was to be recommended. The use of majority voting occurred at several stages in the discussions in order to close down dissent.

In their conclusions, the authors discuss a question which remains open, that is how to interpret the value obtained? The amount fails to relate to economic welfare theory and would seem hard to compare with other microeconomic welfare theoretic measures. At the same time, the 13 panellists cannot claim statistical representation of the general population. If their position is taken as a political indicator, then other alternatives might prove more direct. The authors also raise several other issues including consensus formation, decision rules for polling or voting, equality of juror impact, and provision of information.

IV. MORE VALID RESULTS OR NEW VALUE THEORY?

The review of empirical DMV studies shows the majority have concentrated upon

TABLE 2
RECENT DMV STUDIES CLASSIFIED

Value Provider	Terms in Which WTP Specified	
	Individual (Disaggregated Value)	Social (Aggregated Value)
Individual in a group setting	Charitable contribution (Macmillan et al. 2002; Kenyon and Hanley 2005; Álvarez-Farizo and Hanley 2006, Sessions 1 and 2; Urama and Hodge 2006; Lienhoop and MacMillan 2007b, 2007a)	Expressed social WTP/WTA (Gregory and Wellman 2001)
Group	Fair price (Álvarez-Farizo and Hanley 2006, Session 3)	Arbitrated social WTP/WTA (James and Blamey 2005)

trying to achieve a modified exchange value with minimal deliberative engagement, ostensibly to improve outcome validity. Table 2 lists the empirical studies reviewed as they fall under each of the quadrants of DMV process and outcome. A comparison with Table 1, shows the polar divergence in attention between theoretical advocates and practitioners. Most theorists advocate group arbitrated social values, while most studies are producing charitable contributions by individuals. The two social value studies seem closest to repeating the thrust of the theoretical DMV literature, but this then questions the validity of standard valuation approaches.

Internal Validity

A strong and repeated claim by studies producing WTP/WTA amounts in the charitable contribution category is that DMV has improved the validity of the results. However, none defines what type of validity is being addressed. Validity can be classified in various ways: face validity is whether results are intuitively plausible; construct validity concerns consistency with theoretical foundations; predictive validity is whether the expected outcome was matched by the actual outcome; criterion validity relates to corroborating factors which confirm model prediction and is important where predictions cannot be confirmed by direct observation; convergent validity requires different techniques to give the same results; divergent validity

requires the same technique to give different results where context predicts that should occur, for example, the CVM measuring WTP for two different population income distributions. Attention should be paid to the full range of validity tests. In practice, different aspects of validity seem to be given little attention in the monetary valuation and transfer literature (Spash and Vatn 2006).

The results reported in the preceding section do not appear encouraging in terms of validating standard economic approaches to value theory. The models constructed generally have poor statistical robustness and show an inability of the authors to explain their results. Contrary to standard economic models of exchange, factors such as attitudes tend to arise as key variables. Yet what these attitudes represent is poorly defined and their measurement leaves much to be desired. If construct validity is the objective, and researchers are trying to learn from their empirical results, there would need to be serious attention paid to the attitude-behaviour literature in social psychology. This might indeed be informative, but is as likely to show the prevalence of non-economic motives for valuation as support the exchange value model (Spash 2006).

Predictive validity tests prove problematic with authors unable to explain the outcome of their studies. For example, Kenyon and Hanley (2005) found little change in the “don’t know” responses after deliberation, and participants showed dis-

satisfaction with the outcome of the process. The expectation was the opposite. More generally, there is a problem in terms of what might be expected from DMV, for example, should payments be increasing or decreasing, should they be more or less stable, should the standard deviation increase or decrease? In this respect the theoretical work of Howarth and Wilson (2006) does actually offer a testable hypothesis. The approach of DMV practitioners lacks theoretical underpinning and rigorous hypothesis testing.

Where the research has been more open to reporting rather than rejecting data, there is some evidence for non-economic values arising through open deliberation. That is DMV has been cited as increasing the occurrence of lexicographic preferences (Lienhoop and MacMillan 2007a, 294). This is what a reading of the political process literature would lead one to expect, but it does not help economists produce a more internally valid exchange value and indeed undermines the face validity of any aggregated numbers then produced for a CBA. Similarly face validity is reduced by the approaches taken to control data collection and analysis.

Closing Down Debate and Controlling Value Expression

In looking at the theory behind DMV, there are clearly identifiable divergent expectations resulting in different approaches to the conduct of the process and treatment of data. At one extreme is the desire to control the entire process to achieve a narrowly defined value and at the other a desire for opening-up the decision space to allow for pluralism and social negotiation. This affects the whole process from setting-up and framing the problem, selecting the respondents, conducting the deliberative process, through to analyzing data and presenting results.

O'Neill (2001) differentiates the concerns of political scientists over representation from those of other social scientists. For the former, the aim is to allow for the

expression of legitimate views,⁸ whereas the aim for the latter is prediction and explanation. In both cases, the analyst makes a decision over participation and the criterion for what makes an individual "representative." Representation here diverges from the requirements for legitimacy discussed by O'Neill (2001) and is more concerned with loosely representing a range of socioeconomic characteristics. Indeed, the participants are drawn from a subsample who have already self-selected on the basis of their interest in being a participant.

In DMV, the likes of Ward (1999) argue for representation on a political basis constituted by the views held in society. This appears to be picked-up by the likes of Macmillan et al. (2002, 51) and Álvarez-Farizo and Hanley (2006, 466–67) when they claim that under deliberative approaches participants have some "symbolic representative" role. However, these studies spend their time concerned with statistical representation using socio-economic variables. The selection criteria for socio-economic characteristics under such representation are never explained and even the variables are left unspecified in some cases. Gregory and Wellman (2001) do represent societal views, but via vested interests, which is seen as a potentially problematic route by some theoretical advocates of DMV.

Monetary valuation surveys aim for random or stratified sampling in order to achieve statistical parametric analytical power. As Stagl (2007, 17) notes "this focus on statistical power has been criticized for failing to offer an adequate account of

⁸ Developing the meaning of representation in the political context means differentiating between those outside an existing group who express solidarity (e.g., a man supporting feminism) and those who are assumed to be representative of a group (e.g., a woman writing on feminist issues). The latter can gain legitimacy through authorization by a group and being held accountable to them. This is impossible for future generations and nonhuman species. Thus, O'Neill (2001) argues that their voice must be expressed by solidarity and making epistemic claims of legitimacy. Epistemic claims, which allow someone to speak on behalf of others, include knowledge, expertise, and judgment.

either interpretation or explanation in the social sciences. Interpretative activity is already implicitly presupposed in arriving at statistical generalizations between socio-economic variables." CVM practice is then recognized as failing to take this interpretative dimension seriously. DMV offers the potential to respond to this criticism by collecting small group data that can be used to achieve both the interpretative and explanatory depth missing from large-scale statistical studies. Unfortunately, the main practitioners of DMV bemoan the lack of statistical power rather than developing the skills for conducting interpretative activity.

Worse than just ignoring the richness of the available data, there is evidence of forcing reality into a preconceived model. Several studies see the aim as getting people to conform to a market model of valuation and exchange, even if the people do not wish to do so. This is clear in the considerable effort to "educate" people and remove lexicographic preferences (Urama and Hodge 2006), to remove bids based upon fairness (Macmillan et al. 2002), and to simply remove whole sections of the sample as protestors (Kenyon and Hanley 2005). There is a concern for "identification of invalid responses influenced by strategic bidding or protesting" (Lienhoop and MacMillan 2007a, 292), and "meaningful values" are discussed as requiring "financial incentives, sufficient participant experience and elimination of biased preconceived views" (Lienhoop and MacMillan 2007b).

The general approach of DMV practitioners can be seen as Aldred's (2005) closed input and closed output case, that is, making the DMV comparable (in those terms) to the CVM. Thus Macmillan et al. (2002, 2006) are found to bound choice with a payment card; Urama and Hodge (2006) allude to an open process, while tightly focussing on consequential relationships reinforced by repeated education sessions; and in several studies, the moderator makes sure people conform to the analysts' strictly defined discussion boundaries. Such practices are consistent with the view that preferences need to be informed, even

though the authors often cite the whole DMV approach as aiming to address preference formation. Even James and Blamey (2005), who use a formal citizens' jury, restrict their participants to discussing three pre-selected options with influence only over a fourth. Gregory and Wellman (2001), along with all the theory articles, argue for a more open and honest admission of the types of values which people do associate with environmental change, and the realization that a request for an individual WTP for complex environmental changes is likely to reveal various non-economic motives.

The main position here can be summarized by reference to Hanley and Shogren (2005). They effectively advocated a type of social engineering in order to remove non-market motives, irrational behavior, and "anomalies," and to get people to conform to their theoretical model. As they state: "observed irrationality suggests that we either modify our models, or we keep the models by removing the anomalous behavior with arbitrage." (Hanley and Shogren 2005, 24). Economists then need to design a process so "that people can learn to act rationally" (Hanley and Shogren 2005, 29). In order to achieve the desired behavior requires "active institutions exist that reward reliable and punish unreliable choices" (Hanley and Shogren 2005, 14). The aim is then to "educate" people how to behave rationally so that environmental CBA can be performed without the unwanted and anomalous behavior. "By learning the costs of irrationality when an exchange institution exists to punish such behaviour, people stop being irrational" (Hanley and Shogren 2005, 25). Such authors appear to fall into the economic valuation camp identified by Vatn (2004) as those who regard all anomalies as "measurement bias" to be removed by careful design and data censoring.

The deliberative political model, such as found under a citizens' jury, involves a very different approach. This is an open process where the jurors can call evidence, question alternatives, and express their opinions and concerns with the expectation of these being

TABLE 3
REALMS OF VALUE UNDER DMV

Value Provider	Terms in Which WTP Specified	
	Individual (Disaggregated Value)	Social (Aggregated Value)
Individual in a group setting	Charitable contribution Individual beliefs, subjective norms, selfish altruism, self interest, attitudes	Expressed social WTP/WTA Political pragmatism, social norms, social altruism, vested interests, sympathy
Group	Fair price Fair outcome, distribution, justice, equity	Arbitrated social WTP/WTA Public interest/common good, judgment and common sense, incommensurability, negotiated norms, silent voices, fair process, rights

taken seriously and reported back. In discussing discursive ethics for environmental policy and ecosystem valuation, O'Hara (1996, 105) notes that: "for a discourse process to be ethical it has to be open, respectful, and willing to accept and hear diversity of voices. Otherwise it will be in danger of deteriorating into a manipulative assertion of predetermined agendas."

In discussing DMV, as a value articulating institution (VAI), Vatn (2005) notes the apparent contradiction of using deliberation to foster communicative rationality, via evaluating and defending arguments, and then combining this with stated-preference approaches under a CBA. As he states: "it mixes collective reasoning and consensus building over principles and norms with individual trade-off calculations. It combines a VAI based on capturing incommensurability with one that is focused on commensurability. It mixes a VAI directed towards the 'We' with one based on an 'I' perspective." (Vatn 2005, 360–61). If the aim were to have a DMV clearly separated on the basis of such factors, then only the social WTP/WTA which is achieved via a process of group arbitration and negotiation would appear suitable. Interestingly this is the type of DMV argued for by all DMV theorists except Sagoff. However, the resulting value no longer appears to be based upon current economic theory or models.

What seems to be occurring under DMV is a debate over realms of value along the lines discussed by Trainor (2006). Different

qualities of value are then being expressed through different institutional arrangements as represented by the quadrants of Tables 1 and 2. The exact value characteristics of each quadrant are unclear, but from the review conducted here, I venture to identify different aspects being included and excluded, or being given stronger and weaker emphasis. Thus, Table 3 presents a speculative list of what some distinguishing characteristics might be in order to outline how these realms of value might be differentiated.

V. CONCLUSIONS AND REFLECTIONS

An interesting aspect of DMV is how it has attracted support from economists and others critical of CBA in theoretical articles, while being supported by mainstream economic practitioners in empirical studies. The suspicion that they may be talking at cross purposes seems to be confirmed once the values arising from DMV are classified by means of derivation and value output. Economists practicing environmental CBA have been looking for a process which addresses the failings of their methods without losing the desired closing down to a single definitive monetary number. The economists and others who are theoretical advocates of DMV have been pointing a way towards a variety of alternative forms of expressed and arbitrated social values.

This divergence is very clear in the approach taken to empirical work when compared to theoretical justifications. Prac-

tioners tend to favor individual choice models which mix aspects of the individual and social, and so create mixed, often confused, outcomes. Theorists generally recognize that the process of group deliberation, discussion, and decision is central to the whole DMV approach and argue for consensus group outcomes. Participant selection for involvement in DMV, as a form of citizens' jury, requires recognizing variety in social positions on an issue, but economic practitioners maintain a desire for random selection from a general population. In practice, selection may be from interest groups, on the basis of undefined socio-economic characteristics, using semi-random, quota, or convenience samples. Representing silent voices is important for most theorists, as is the recognition of incommensurability and issues of rights and justice. Case studies reveal the expression of non-utilitarian concerns such as fairness, along with refusals to trade, and lexicographic preferences. Several practitioners regard such things as in need of avoidance and removal, while theorists tend to see such expressions as expected, accepted, and even encouraging.

Economists applying stated-preference methods are then faced with dogmatically sticking to their old models and removing what they regard as unacceptable behavior, and motives, or accepting that there are other ways in which environmental values can be conceptualized and articulated, even as monetary numbers. What seems evident is that open deliberation will raise a range of issues that some CBA practitioners would apparently like removed from the environmental values agenda. There is then a need to take seriously the role of economics as an empirical science. This means reflecting upon the evidence of studies and changing theory in light of the evidence. DMV cannot be used to claim validity for values which participants themselves protest about, reject, or qualify in numerous ways. Neither should DMV be seen as a means of social engineering by which individuals can be "educated" as to the rationality of expressing market values over environmental entities.

The most interesting potential of the approach would seem to be in the area of socially arbitrated valuation using a process of group decision-making that is explicitly designed to address the concerns of political scientists with respect to small group conduct. Unfortunately, very little empirical DMV work has been directed towards exploring this realm of value. Of course, serious research in this area may result in some economists having an identity crisis or, more likely, regarding the whole project as "non-economic." So, one conclusion might be to reject DMV altogether and leave political scientists to develop approaches such as citizens' juries, including value dimensions, without economists interfering. Economists conducting environmental CBA would then presumably be ordered to withdraw to the, assumed to be, safer havens of revealed preferences. However, this is just the old-fashioned demarcation and division approach, whereby lines are drawn (and redrawn) between disciplines, and interdisciplinary research agendas are denied, in order to protect some core concepts regardless of empirical evidence.

There is also an apparent practical need among government agencies and within the policy community for advice and input on "valuation" issues. Yet this does not necessitate CBA, or preference utilitarianism, especially where there is an obvious lack of several important types of validity. Agencies request more complete information, on the pros and cons of actions, than provided by conventional economic studies, as well as details on distributional impacts of economic, social, and environmental costs and benefits (Gregory and Wellman 2001). There are contexts in which a rigorous DMV alternative could prove a far richer source of information in specific decision contexts. Such approaches might suit some circumstances better than others for example, local or regional decisions over budget allocations, choices between defined management options, decisions where experts or vested interest groups are acknowledged as the appropriate authorities, prob-

lems where conflict is prevalent, and so on. Relevant aspects of valuation for policy go beyond simple number production and can include how different individuals and groups come to hold their values, how those values are expressed, and how different factors influence a change in values (Trainor 2006).

The other side of the policy fence, is the body politic who have a need to express their values and have their concerns taken seriously. One thing the journey into stated-preference methods has revealed is how narrow mainstream economic conceptions of value appear compared to empirical reality. For example, the closest DMV category to exchange value is the charitable contribution: a common behavior with real resource implications. Reflection and evidence show charitable giving is fundamentally different from purchasing commodities; recognizing this can quickly and intuitively explain insensitivity to changes in scope or scale (i.e., part-whole bias, embedding). More generally, production of a monetary number does not mean the value obtained is comparable with the numbers in a CBA study or based upon microeconomic welfare theory. DMV, as reviewed in this paper, shows four distinct ways in which people can value environmental change and may do so producing money numbers to represent different concerns. Not only are multifaceted concerns raised by many environmental changes, but also group social values are seen to be divorced from individual-based value theory. All the empirical studies reviewed here show aspects of valuation which appear inconsistent with standard economic theory, while pointing towards alternative approaches for understanding human choice.

Developing, designing, and testing alternative approaches for value articulation in different contexts is something which economists could undertake along with decision theorists and others. However, the economists best suited to this task would be those who have some training in methodology, institutional analysis, and interdisciplinar-

ity, who accept and comprehend the importance of qualitative as well as quantitative data, and who understand the role of motives to action for informing policy. Perhaps this requires a new type of political economist who has an open mind allowing them to interact creatively with those from other disciplines such as psychologists, political scientists, and applied philosophers.

If economics is really an empirical science then its method must improve from trying to fit the data into the model to accepting observations as a means of learning, which often challenges accepted theory and requires change in that theory. In the current context, this means recognizing the richness and diversity of values and their motivation. Improving how environmental problems are addressed as complex plural value issues means understanding which realm of values is relevant to a given decision and its context. Processes should then be employed which offer the best means available to help articulate those values.

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