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Contingent Valuation and Cultural Resources: A Meta-Analytic Review of the Literature

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Abstract. Contingent valuation methodology (CVM) has been increasingly applied to cultural resources. CVM employs survey methods to gather stated preference information, which can be used to estimate economic values of various cultural resources and projects. Although popular in other fields, the application of CVM in the cultural arena is relatively recent. This article summarizes this growing body of empirical literature and its range of findings. A meta-analysis gives a statistical view of the "state of the art" of the literature. This preliminary analysis sheds light on the consistency and validity of the use of this method in cultural applications.

Key words: contingent valuation, heritage, meta-analysis, willingness to pay

1. Introduction

Contingent valuation methodology (CVM) and the closely related "contingent choice" methods have become increasingly popular in cultural economics. Empirical researchers use this method to explore the non-market values of various cultural resources. This primer on CVM's use in cultural economics introduces and critically reviews the contributions made by the literature thus far.

First, CVM is briefly and formally described. Second, a history and survey of the literature captures the breadth of research published thus far and highlights some findings. A few representative studies are described in greater detail. Third, the broader universe of CVM studies applied to cultural resources is described and analyzed in quantitative terms using a preliminary meta-analysis.[1] This meta-analytical approach allows for a more systematic accounting of the nature of these studies. Finally, the conclusion summarizes where the "state of the art" of CVM stands in the field of cultural economics.

2. Background

CVM involves using surveys to elicit a willingness to pay (WTP) from individuals for hypothetical changes in some good or service. CVM is the most popular method in a family of alternative stated-preference techniques, known as "Choice Modeling" or "Conjoint Analysis". Generally, these surveys ask respondents to rate, rank, or choose among alternatives described in terms of various levels of attributes

(Mazzanti, 2002). This paper considers all of these closely related methods but refers to "CVM" for brevity.

The basic theoretical framework for CVM studies considers an individual (or household) utility function, u, as a function of market goods, x, and the level of a public good or service provided, q.[2] Individuals minimize expenditures px subject to $u = u^*(x, q)$, leading to their expenditure function $e = e(p, q_0, u^*)$ where q_0 is the current level of the good provided. Respondents' WTP for a change from q_0 to q_1 is defined as $\text{WTP}(q) = e(p, q_0, u^*) - e(p, q_1, u^*)$.

WTP can be elicited in a number of different ways. The open-ended elicitation format directly queries respondents for their WTP for a constant utility level. The valuation function is estimated via a straightforward regression of WTP responses on respondents' demographic and socioeconomic characteristics, X (e.g., income, age, education). X also often includes respondents' previous experience with q and the availability of substitutes. Variation in q_0 or q_1 or in other survey design features (e.g., payment vehicle, information provided) among respondents can also be included in the regression:

$$\text{WTP} = \beta X + \delta Q + \varepsilon,$$

where Q is a vector of survey characteristics, β and δ are vectors of regression coefficients, and ε is the error term. Statistical significance of β tests survey validity for variables that economic theory predicts would determine demand (income, substitutes, etc.). Likewise, tests of significance of δ can indicate sensitivity to changes in scope of q or other survey biases. The regression allows the estimation of a mean WTP, calculated at the sample or population mean of the independent variables collected from the survey.[3]

The dichotomous choice format, like a referendum, asks ("yes" or "no") whether WTP exceeds a specified amount. Econometrically, the probability of a "yes" response for a given dollar amount w (called a "bid" amount) is modeled as $\Pr(\text{yes}) = \Pr(\text{WTP} + \varepsilon > w)$. The WTP response is typically regressed on a constant, w, X, and Q using logit, probit, or Weibull functions (see Giraud et al., 2001). This allows the calculation of a mean WTP parametrically at sample means.

Nonparametric estimation methods are also commonly used. Other methods, such as payment cards,[4] elicit interval data where WTP responses are bounded above (w_2) and below (w_1). Interval data regression techniques estimate $\text{WTP} = \beta X + \delta Q + \varepsilon$, where WTP is the latent WTP value. Some CV surveys elicit multiple WTP responses per respondent, sequentially varying either bid amounts or even formats. Econometric models use these sequential bids to improve efficiency and identify biases.[5]

3. The Literature

Since the first CVM study was published almost 40 years ago, CVM has been applied to numerous environmental amenities and damages, as well as to other

fields. The validity of CVM has been hotly contested. The National Oceanic and Atmospheric Administration (NOAA) convened a blue-ribbon panel of experts, chaired by Nobel laureates Kenneth Arrow and Robert Solow, who published a qualified endorsement of CVM along with guidelines for quality research (Arrow et al., 1993). The debate on methods and applications raged on while thousands more studies followed.

Although Carson's (forthcoming) latest bibliography of CVM studies holds over 5,000 entries, the number of published CVM studies of cultural resources is but a tiny fraction of this. A handful of studies were done during the 1980s, but the first substantial wave of CVM studies in this field came on the heels of the NOAA report in 1993. Researchers conducted valuation studies of numerous European historical sites and museums in addition to other cultural resources scattered around the globe. By the close of the 1990s, this stream of empirical research increasingly flowed into academic and policy-related publications. Sixty-one of the 139 reports I have discovered have been published since 2000, indicating a surge in research interest.

The empirical research on valuing cultural resources using stated preference techniques covers a considerable range of topics. CVM studies have elicited values for very local goods like public broadcasting in Las Vegas (Schwer and Daneshvary, 1995) and an historic hotel in Ft. Collins, Colorado (Kling et al., 2001), as well as World Heritage Sites like Stonehenge (Maddison and Mourato, 2001) and the Fés Medina (Carson et al., 2002). Studies have surveyed values for the abstract, such as preserving grazing traditions in the Australian Alps (Lockwood et al., 1996), and the concrete, such as replacing a road with a tunnel at Stonehenge (Maddison and Mourato, 2001). This literature spans elite (e.g., Bille Hansen, 1997) and popular (e.g., Johnson and Whitehead, 2000) cultural institutions.

The variety in the application of CVM has been matched by variety in the quality of the research. Financial constraints and feasibility often force researchers to neglect at least one of the NOAA report's guidelines. An assortment of problems plague numerous studies, such as a low response rate (Schwer and Daneshvary, 1995), an implausible good (Holt et al., 1999), and a poorly defined good (Glass et al., 1999). This latter case, ambiguous goods, is prevalent. The Kansas Arts Commission, for example, asked about WTP for "an increase in the amount of arts activity in your local area", with no further detail of what that increase would entail. Other reports (Thompson et al., 2002; Papandrea, 1999) specify the change somewhat more precisely by indicating a percent change in the amount of some activity – presuming some knowledge of the status quo quantity. Many studies (e.g., Throsby and Withers, 1986; Bille Hansen, 1997) simply ask respondents how much they are willing to pay in taxes for increased government spending in some general area. The cultural resource being valued in these reports is thus government spending (or whatever the respondent imagines those funds produce). The variety in research quality directly corresponds to the validity of the studies' estimates, which needs to be evaluated on an individual study basis.

The general CVM literature has debated numerous issues. Good reviews of these debates can be found in Carson et al. (2001), Portney (1994), and Mitchell and Carson (1989). These issues, too numerous and complex to discuss here, all pertain to the application of CVM in cultural economics. Frey (2000) identifies a few challenges facing cultural applications in particular. Goods in this arena, and notions of heritage especially, are typically "lumpy" in the sense that marginal changes in their provision are difficult to conceive. Constructing plausible contingent markets may be problematic or even impossible for many cultural goods. Familiarity with the good in question typically lends reliability to CVM surveys, something that may prove elusive to researchers in a field in which abstract cultural goods cannot be even hypothetically commoditized. The existence of positive values from some groups and negative values from others also complicates research design. Unlike many environmental amenities, which can at least be ignored by unfavorable respondents, cultural goods like major public art displays often evoke passionate and diametrically opposed responses, perhaps because these goods bear closely on individuals' identities. Researchers can address the presence of negative WTP values at two points: at the survey design stage and in the econometric analysis of the resulting data. A final challenge to estimating values involves the "cultivation of taste" endemic to many cultural resources (Stigler and Becker, 1977). The presence of upward-sloping demand curves for certain cultural goods makes interpreting survey results more difficult.

In spite of these methodological challenges, CVM researchers have forged ahead. Trine Bille Hansen (1997) conducted a major contingent valuation study in 1993. Using a telephone survey of 1,843 Danes, she elicited their WTP through taxes for the Royal Theatre in Copenhagen using an open-ended WTP question format. The econometric analysis found that non-use values comprise the bulk of the aggregate social value of the theatre. Users were willing to pay at least three times as much as non-users.

Lockwood et al. (1996) measured the value of a less tangible cultural good, the tradition of grazing in the Australian Alps. The region has a long tradition of grazing, but many also recognize this lifestyle's environmental damage. Half of the 702 mail surveys asked for a WTP to stop grazing in the area, and half asked for a WTP to continue grazing while reducing its environmental impacts. The intent was to measure the values of the grazing tradition and of environmental conservation in the area. They estimated a mean WTP of $73 for continuing grazing and a mean WTP of only $30 for stopping grazing.[6] This is a rare example of a study that compares values for competing uses involving cultural resources.

Another innovative valuation study concerned congestion at the British Museum. Maddison and Foster (2001) asked 400 visitors their WTP to reduce congestion inside the museum. They conducted a choice experiment by showing visitors photos of exhibits when crowded and when less crowded. The survey associated the crowded photos with the (status quo) free admission and the less-crowded photos with a randomly chosen admission charge, and respondents indicated their

preferred scenario. Using the differences in crowd size between photos, Maddison and Foster estimated a congestion cost of $12.40 imposed by the marginal visitor (on all other visitors, aggregated).

Many other CVM studies of visitors to historic sites measure WTP for admission or service improvements. For example, Mazzanti (2002) surveyed visitors to the Galleria Borghese in Rome. In addition to two contingent valuation questions, the survey conducts a contingent choice experiment wherein interviewees are asked whether they prefer different scenarios to the status quo. The scenarios varied in terms of museum access time (2 or 3 hours), ancillary services provided, and admission fee. Mazzanti found no WTP for increased access time and mean WTPs of $2.59 for temporary exhibitions and multimedia services, $1.51 for just multimedia services, and $3.79 for special conservation activity. Two CVM questions also elicited WTP for visiting the museum as-is and for a special conservation fund for the museum. The median WTP of $8.15 for admission compares favorably with the status quo fee of $7.13. Mazzanti estimates the potential direct revenue that could be generated by implementing these policy changes in addition to the current admission charge. Surveys of this type provide practical information for museum managers and policymakers alike.

A final example of the literature is a study of Mexican archeological sites by Beltrán and Rojas (1996). The authors conducted CVM surveys at three archeological sites in Mexico and in seven Mexican cities. Like numerous lesser-quality studies in the literature, this report failed to provide essential information about instrument design and sampling methods, leaving the specific good being valued unclear. They appeared to obtain two WTP values, one for visiting archeological sites and one for a monthly contribution to preserving sites. Of the "visitors" interviewed in cities, mean WTP for visitation varied between $4.57 and $6.83, depending on the city. Of the visitors interviewed on site, mean WTP for consumption of archeological sites ranged from $2.92 to $7.63, depending on the site and visit day. Interestingly, even though the weekday admission fee was $4.31, the mean WTP of weekday visitors to the rural site measured only $2.92. More information about the survey instrument and sampling methods would be required before the validity of the instrument and reliability of the results could be assessed.

4. Meta-Analysis

Although an annotated bibliography of over 100 citations is available (Noonan, 2002), much can be gleaned from a statistical summary of the literature. Many more studies have recently appeared. Table I depicts the counts of the original studies that I have identified by year, country, and topic. (Note that most studies are published in more than one report.) I have classified the cultural goods studied by topic into the following categories: archeology, the arts, broadcast (and media), historical sites, heritage, libraries, museums, sports, and theatre. Heritage goods, unlike historical sites, lack substantial use value even on-site (if a site exists).

Table I. Published CVM studies by year of publication, country, and topic

Year	# of studies	Year	# of studies	Country	# of studies	Topic	# of studies
1972	1	1994	3	United States	16	Archeological sites	3
1980	1	1995	3	U.K.	12	Arts	10
1982	1	1996	6	Italy	12	Broadcast	8
1983	1	1997	4	Canada*	6	Heritage	7
1986	2	1998	11	Australia	5	Historical site	26
1988	1	1999	6	Ireland	3	Libraries	3
1990	1	2000	9	Norway	2	Museums	10
1992	2	2001	6	others [a]	17	Sports	2
1993	1	2002	13			Theatre	3

[a] One each for: Argentina, Austria, Bulgaria, Croatia, Denmark, Finland, France,* Israel, Mexico, Morocco, Peru, Portugal, South Africa, Spain, Sweden, Switzerland, Tanzania.
* Bégin et al. (2000) study both Canada and France, and this study is double-counted above.

The following meta-analysis describes the literature using data from 65 studies.[7] In these studies, 129 different WTP estimates were observed. Following Smith and Pattanayak (2002), consistency among these WTP measures and among the goods in question is critical to the meta-analysis, although this preliminary summary is not intended for benefit transfers.[8] The results here should not be extrapolated to estimate values of other cultural resources. Rather, the purpose here is an exploratory "taking stock of progress" in this field. I use the meta-analysis to assess whether the patterns in the findings are consistent with expectations, whether the variation in findings can be attributed to methodological differences, and whether information bias is a significant problem across the literature. The task is to find "signal" amidst the "noise" of various subjects, techniques, and results in this literature.

The variables used here describe the survey findings, its methods, and the good in question. They are summarized in Table II. The descriptive statistics are reported in Table III. Because the unit of observation is a particular good and sample with associated WTP estimate(s), some observations report both a mean and a median WTP.[9]

Table III describes the current store of empirical CVM research that has been done for cultural resources. Table III should be interpreted with some caution. All estimates are given equal weight, not all studies. Nonetheless, the literature's defining characteristics are evident. Most estimates came from intercept surveys,[10] and 39% of the estimates were found in reports citing the NOAA report. 7% of the estimates describe WTP for changes in government spending levels. Almost a quarter of the estimates came from respondents who were informed of current or expected costs. The WTP estimates have a mean value of nearly $42.78 and a median value of $21.69. The mean estimated cost per capita is $18.93, although

Table II. Variable definitions

Variable	Description
Median	median WTP reported, adjusted to March 2002 U.S. dollars
Mean	mean WTP reported, adjusted to March 2002 U.S. dollars
Ratio	Median/Mean
Variables describing goods' characteristics	
Topic: X	categorical variable for the class of good (museum, broadcast, etc.)
Use	whether the scenario involved predominantly use value
Mixed	whether the scenario involved both use and non-use value
Spend	whether the good being valued was government spending levels
Scale: X	categorical variable for scale of the good in question (local, regional, national, or World Heritage Site)
Cost	estimation of per-capita (2002 US$) cost of provision according to study authors
Avoid	whether the scenario involved WTP to avoid reduction of current service levels
Admit	whether the good valued was admission to a site
Partic	whether the good valued was a particular good or site (as opposed to an aggregate of goods)
Variables describing surveys' characteristics	
Year	year that the survey was undertaken
Once	whether the payment was not a flow payment
SurveyN	size of sample in survey from which the WTP is estimated
Visitors	whether visitors to site or good constituted the sample
NOAA	whether the report cited Arrow et al. (1993)
Mode: X	categorical variable for how the survey was administered (mail, intercept, phone, door-to-door)
TellCost	whether respondents were informed of current or projected expenditures or costs, including a posted admission fee
DC	whether the WTP elicitation used a dichotomous choice format
OE	whether the WTP elicitation used an open-ended format
Private	whether the payment went to the institution managing a site or to a private organization
Tax	whether the payment was in the form of a tax or part of taxes already being paid

Table III. Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min.	Max.	Mean WTP [a]
Median	54	21.686	31.833	0	136.761	
Mean	124	42.779	60.409	0	304.615	
Ratio	48	0.667	0.511	0	2.618	
Use	127	0.283		0	1	21.66 [b]
Mixed	127	0.543		0	1	54.71 [b]
Spend	129	0.070		0	1	92.85
Cost	51	18.931	32.928	0	165.052	
Avoid	125	0.328		0	1	62.81 [b]
Admit	129	0.186		0	1	9.27 [b]
Partic	128	0.750		0	1	36.71 [b]
Year	129	1995.364	5.732	1969	2002	
Once	128	0.383		0	1	30.20 [b]
SurveyN	124	459.484	788.768	22	5603	
Visitors	126	0.397		0	1	39.14
NOAA	121	0.388		0	1	55.28
Mode: Mail	123	0.146		0	1	44.27
Mode: Intercept	122	0.549		0	1	35.85
Mode: Phone	124	0.185		0	1	48.73
Mode: Door	123	0.089		0	1	99.77 [b]
TellCost	119	0.244		1	1	26.68 [b]
DC	128	0.312		0	1	61.85 [b]
OE	128	0.312		0	1	50.76
Private	129	0.473		0	1	42.05
Tax	128	0.313		0	1	46.52
Peer-reviewed?	129	0.357		0	1	50.81
Response rate	53	0.658	0.223	0.064	0.957	

[a] "Mean WTP" column shows average WTP for observations where binary variable takes a value of 1.
[b] Indicates that mean WTP differs significantly (10% level) between samples based on binary variable.

fewer than half of the estimates publish associated cost estimates. Two fifths of the estimates came from samples of on-site visitors whereas fewer than a fifth valued admission fees. Fifteen estimates out of 129 pertained to World Heritage Sites.

Although these variables suggest considerable variety in the research, there are many strong correlations among variables as expected. Table IV shows simple correlations between mean WTP and non-binary variables from Table III. As median WTP and Cost rise, so does the mean WTP. Survey sample size and response rate appear unrelated to the mean WTP.

Table IV. Selected correlations

	Median WTP	Ratio	Cost	Year	SurveyN	Response rate
Mean WTP	0.54 [b]	0.34 [b]	0.36 [b]	–0.17 [a]	–0.005	–0.15

[a] Significant at 0.10 level.
[b] Significant at 0.05 level.

A multivariate approach allows a better description of the patterns in the literature. The large body of research on CVM applications, to environmental goods especially, indicates that characteristics of the goods being valued as well as features of the survey methods influence the WTP estimates. Meta-regressions can detect a systematic relationship among the variables and whether they conform to findings in other applications of CVM. Consider a stylized meta-regression model, common to meta-analyses of CVM (see Horowitz and McConnell, 2002; Boyle et al., 1994; Woodward and Wui, 2001; and especially the several references in Smith and Pattanayak, 2002):

$$\mathrm{WTP}_{ij} = \beta_0 + \beta_1 \mathrm{METHOD}_{ij} + \beta_2 \mathrm{GOOD}_{ij} + \theta_j + \varepsilon_{ij},$$

where WTP_{ij} refers to estimate i from study j, METHOD is a vector of variables describing features of the survey design and administration, GOOD is a vector of variables describing the good under consideration in the survey, θ_j is the study-specific error term and ε_{ij} is white noise error. The random effects models allow for estimates deriving from a particular study to share an unobserved (error) term. This controls for study-specific influences that are uncorrelated with the other regressors, although other specification problems may remain.[11]

Three basic regressions are estimated for the characteristics of the survey (with restriction $\beta_2 = 0$), for the characteristics of the goods (with restriction $\beta_1 = 0$), and for a combined model (unrestricted). These are presented in Table V as Model 1, Model 2, and Model 3, respectively. This preliminary meta-regression analysis should be interpreted with caution. As is typical in this sort of analysis with many binary regressors and a small N, the emphasis should be placed on the sign, significance, and patterns in the estimated coefficients rather than their precise values (Boyle et al., 1994). The validity of meta-regressions relies heavily on consistency in the goods being valued across studies. Obviously, the resources in question differ in ways that the independent variables do not fully capture, making the results – especially for purposes of benefit transfer – suspect (Smith and Pattanayak, 2002).[12] Nonetheless, a simple description of the relationships among these variables, if there is a pattern at all, is instructive of the state of the art in this field of application.

The Model 1 column depicts the regression of average WTP values on survey characteristics (e.g., payment vehicle, administration mode, elicitation format, year, sample size and location). Volumes of applied contingent valuation and survey methodology research have shown that the design and administration of

Table V. Meta-regression models

Variable	Model 1 (survey features)		Model 2 (goods features)		Model 3 (combined)		Model 4 (information bias)	
Constant	5147.16[a]	(1.88)	33.80	(0.79)	3053.04	(1.23)	10088.4[b]	(3.72)
Once	–2.29	(–0.13)			51.83[a]	(1.87)	63.05[b]	(–2.56)
Private	27.66	(1.25)			5.82	(0.28)		
Tax	29.67	(1.53)			5.93	(0.27)		
NOAA	17.90	(1.48)			22.93	(1.29)	34.60[b]	(2.73)
TellCost	–28.60[b]	(–2.24)			–12.07	(–0.88)	–54.71[b]	(2.40)
Mode: Door	92.09[b]	(2.44)			95.78[b]	(2.94)	108.71[b]	(5.30)
Mode: Phone	25.28	(1.08)			–2.83	(–0.13)		
Mode: Intercept	–0.81	(–0.04)			20.50	(0.93)	9.19	(0.64)
DC	37.53[b]	(3.19)			34.58[b]	(2.52)	52.69[b]	(3.49)
OE	15.85	(1.12)			10.05	(0.84)	19.47[a]	(1.95)
Year	–2.58[a]	(–1.88)			–1.53	(–1.22)	–5.04[b]	(–3.73)
SurveyN	–0.02[b]	(–2.67)			–0.04[b]	(–3.20)	–0.05[b]	(–4.83)
Visitors	13.37	(1.00)			–4.94	(–0.32)		
Avoid			25.26	(1.53)	9.58	(0.69)		
Topic: Archeo.site			39.07	(1.58)	54.66[b]	(2.77)	56.20[b]	(2.22)
Topic: Arts			1.99	(0.11)	7.28	(0.31)		
Topic: Broadcast			–23.91	(–1.41)	–1.10	(–0.05)		
Topic: Heritage			–8.06	(–0.36)	33.24	(1.35)		
Topic: Museum			–10.33	(–0.62)	–5.52	(–0.32)		
Topic: Sports			37.07	(0.71)	50.82	(1.46)		
Use			–0.38	(–0.02)	–7.57	(–0.38)		
Mixed			4.08	(0.16)	8.84	(0.39)		
Scale: Regional			0.03	(0.001)	–5.52	(–0.34)		
Scale: National			23.50	(1.14)	16.26	(1.01)		
Scale: World			23.99	(1.03)	–20.93	(–0.76)		
Spend			35.68	(1.08)	60.13[b]	(2.28)	53.61[b]	(3.80)
Admit			–23.44	(–1.64)	–32.01	(–1.27)	0.12	(0.004)
Partic			–11.53	(–0.58)	–30.34[a]	(–1.75)	–49.74[a]	(–2.02)
Cost							0.62[b]	(2.77)
TellCost × Cost							0.01	(0.02)
N	116		124		116		48	
Studies included	54		56		54		30	
F	2.90		5.65		74.50		725.08	
R^2	0.30		0.23		0.48		0.84	

Note: Figures in parentheses are *t*-statistics.
The omitted Topic is Historical Sites (the most common category), along with the single theatre study (Bille Hansen, 1997).
[a] Indicates significance at the 10% level.
[b] Indicates significance at the 5% level.

surveys can systematically influence responses. See Bishop and Romano (1998) for a list of some known biases. Table V demonstrates that surveys in the cultural arena are no exception. Overall, Model 1 explains a moderate amount of the variation in the 116 WTP estimates – with an R^2 of 0.30. As expected, several variables exhibit significant effects. WTP estimates deriving from dichotomous choice format questions are significantly higher, as expected, owing perhaps to yea-saying response behavior (Boyle et al., 1994; Carson et al., 2001; Mitchell and Carson, 1989). Door-to-door surveys (and phone and intercept surveys to a lesser extent) are also associated with higher WTPs, perhaps because of interviewer effects as well as a selection bias in the model (where more expensive door-to-door surveys tend to be performed only on more valuable goods). A pair of F-tests reveals survey modes and elicitation format variables are jointly significant at the 10% level. A time trend is evident, where WTP estimates appear to be falling over time. Larger sample sizes are associated with smaller WTP values. Studies that cite the NOAA report, indicating at least a familiarity with proper CVM techniques, tend to produce higher WTP estimates despite the NOAA panel's recommendations in favor of conservative survey design.[13] Payment vehicles (tax, private fund, or omitted), though often shown to be significantly related to WTP within studies, are not significant predictors of WTP (jointly or separately). This result is indicative of an important issue with the meta-regression in Table V, which restricts $\beta_1 = 0$. Insofar as GOOD is related to METHOD, an omitted variable bias can be expected. This may be evident in the significant, negative effect of informing respondents of provision costs. Likely, because TellCost is closely associated with admission fee surveys, its coefficient is biased downward by not controlling for the types of goods involved. The same holds for Once.

Regression of WTP on the goods' characteristics provides another illustration of research patterns. Yet, uniform and objective descriptors of the disparate goods in question, based solely on the published reports, are scarce. Model 2 results in Table V indicate a modest fit to the data, although individually none of the variables is significantly related to the WTP estimates. This is largely due to limited descriptive power of the binary explanatory variables. Jointly, some estimators are statistically significant. Archeological sites, while not significantly higher in value than the (omitted) historical sites, are significantly higher in value than heritage and museum goods. The joint F-test on the significance of the Topic categories has a p-value of 0.13. The signs of the remaining coefficients are not surprising, even though none are statistically significant. WTP for goods that involve avoiding a loss exceeds other goods' WTP. WTP is positively associated with larger scale goods and goods that are essentially public spending levels. In addition, admission fee studies and more particular (site specific) goods tend to involve lower WTP values, all else equal.

Model 3 combines Model 1 and Model 2 to estimate the full meta-regression model in Table V. The significance of the overall model, as expected, has increased dramatically. F-tests resoundingly reject the hypotheses that β_1 or β_2 are equal to

zero. Door-to-door surveys, dichotomous choice surveys, and small sample surveys still yield higher WTP estimates. A few of the findings have changed substantively from those of the restricted models. Studies mentioning NOAA still have higher WTP estimates, although this effect is not significant. Similarly, after controlling for goods characteristics, the effects of one-time payment surveys and those in which respondents are informed of costs are now substantially larger as expected. Archeological sites and goods defined as public spending levels are related to higher WTP studies now, after controlling for method characteristics. Aggregated goods also exhibit significantly higher WTP. Effects of time trends and payment vehicles are diminished in the combined model.

Meta-regressions using this dataset permit investigation of two issues central to CVM in general and cultural applications in particular: information effects and value distributions. Although information describing the scenario in question is essential to the survey, certain information could bias respondents' answers. For example, information about current tax burdens can bias responses toward that amount (Throsby and Withers, 1986). Alternatively, Bille Hansen (1997) found information about current tax share to dramatically reduce the variance of responses rather than their central tendency. Other information effects are also possible.[14]

A meta-regression can identify effects of providing information as present in the literature. Model 3 indicates that WTP values are lower when respondents are informed of costs, although this effect is not statistically significant. Such a fixed-effect information bias, in which average WTP estimates are uniformly lower when cost information is provided, is one form of information bias. Another form of information bias may have WTP more (or less) closely associated with per-capita costs when those costs are told to respondents than otherwise. This possible bias is measured in Model 4 in Table V by including Cost and a TellCost $\times$ Cost interaction in a regression with survey and goods characteristics. If the interaction term is significant, then informing respondents of costs has an effect scaled by Cost. Using cost estimates published in the studies restricts the sample to 48 WTP estimates. Due to the smaller sample size, a limited selection of regressors is used (i.e., regressors in Model 3 with p-values < 0.25, with no heritage or sports studies remaining in the sample).

The Model 4 column displays the information bias results. For this sample of studies, cost estimates are very closely related to WTP, with Cost serving in part as a proxy for the magnitude or quality of the good in question. Raising Cost by \$1 is associated with a \$0.62 increase in WTP estimates, regardless of whether respondents are informed of this cost. WTP values are substantially lower for studies in which respondents are informed. This information effect, however, appears independent of the cost amount itself. This conservative effect of telling respondents about costs may reflect an unobserved characteristic of the types of goods for which costs estimates are known, a method for counteracting a hypothetical bias present in WTP surveys, or some other effect. Nonetheless, Table V does not indicate that WTP is any more related to Cost when respondents are informed of

Table VI. Median to mean ratio regression

$N = 48$		$R^2 = 0.65$	
$F(10, 24) = 8.26$		(25 studies included)	
Variable	Coef.	(t-statistic)	$P > \|t\|$
Constant	–92.495 [b]	(–3.02)	0.006
SurveyN	0.0001	(0.88)	0.388
Mode: Intercept or Door	0.233	(1.55)	0.135
Admit	0.448 [b]	(2.53)	0.018
DC	0.113	(0.50)	0.620
OE	–0.128	(–0.64)	0.530
Private	–0.579 [b]	(–3.11)	0.005
Use	–0.232	(-1.65)	0.111
Topic: Heritage goods	–0.812 [b]	(–4.62)	0.0001
Scale: National or World	–0.301 [a]	(–1.82)	0.081
Year	0.047 [b]	(3.07)	0.005

[a] Indicates significance at the 10% level.
[b] Indicates significance at the 5% level.

that cost or not.[15] Anchoring and information effects pose another interesting area for continued CVM research.

The second issue concerns the distribution of values. A skewed distribution of WTP values is a common finding in empirical work, because many people have low WTP and a few people have very high values. Biases in the survey instrument that lead respondents to inflate their WTP (perhaps strategically) can exacerbate the difference between mean and median WTP. Among the 48 estimates that include both a mean WTP and a median WTP in the literature, the mean is $22.61 or 1.5 times higher than the median on average. For ten of the 48 observations, however, the ratio exceeds unity. To test whether there is a systematic pattern in the disparity between mean and median, a final meta-regression is employed. A set of survey and goods characteristics serves as the independent variables.[16]

Table VI shows some predictors of the ratio of median to mean. Positive effects indicate characteristics related to higher medians relative to means. Over time, ratios appear to be climbing. Ratios are also higher for admission-fee studies, confirming the expectation that market-related goods exhibit less skewed value distributions. Controlling for admission fee studies, goods with primarily use value are associated with lower ratios, although the effect is not significant at the 10% level. Private payment vehicles tend to yield mean WTPs substantially higher than median WTPs. Likewise, heritage goods and large-scale goods have lower ratios, where a few respondents may be expressing extreme WTP values. Although DC and OE surveys are expected to have positive and negative effects on the ratio, respectively, the estimates in Table VI have the correct sign but lack statistical

significance.[17] Sample size does not have a significant influence either. Survey administration mode may have an effect, where median WTPs rise relative to mean WTPs when surveys are conducted in person.

5. Conclusion

Estimating the economic value of cultural resources presents an important and growing field of applied research. Valuation of cultural programs and assets offers a way for decision-makers to compare the intangible benefits (and costs) of various alternatives. Valuation estimates make the opportunity costs of different allocation decisions transparent. Armed with valuation estimates, policymakers can see the benefits of undertaking certain projects, cultural institution managers can weigh different alternatives, and analysts can undertake more complete cost-benefit analyses. Unfortunately, the non-market nature of many cultural resources makes the use of methods like CVM a regrettable necessity (see Epstein, later in this volume). Although rife with criticism, the method holds the promise of improving our knowledge of cultural resources' role in society.

This paper has shown the scope of the literature employing CVM in cultural arenas. It has painted a broad picture of the sorts of applications, methods, and findings in the published literature. The research varies widely within each of these dimensions. Although most findings appear sensible on the surface, poor methods plague several studies. The development of CVM in other fields has informed much of this research, and the preceding meta-analyses indicate that applications in the cultural arena are generally consistent with expectations. Survey quality and characteristics matter, as does the good in question. The distribution of WTP values, for example, is influenced by survey design features, familiarity with the good, and whether the scenario involves more abstract goods. Information bias continues to pose a critical obstacle in CVM applications, although it seems that cost information effects may not be straightforward.

The summary statistics and meta-regressions above enable us to "take stock" of CVM in cultural economics, but this must be done in light of serious limitations in data availability and the paucity of comparable studies available. Many valuation studies report insufficient information (on the instrument, sampling, econometrics, etc.) to fully characterize them. The meta-regression results should be interpreted cautiously insofar as the controls used vary with cultural resource characteristics. These limitations should deflect focus away from particular coefficient estimates to the basic conclusion that CVM findings in arts and culture are more than white noise, and they even reveal patterns similar to other applications. The coming wave of cultural CVM studies promises to expand and improve this important area of research.

Notes

1. Several criteria bound the literature discussed here. The survey of the literature is limited to English-language publications employing a contingent choice survey, defined below, in an empirical study of a cultural resource. By "cultural resource", I mean those goods, services, proposals, or projects that include a predominantly or explicitly cultural dimension. This includes, but need not be limited to, cultural resources in the areas of archeology, the arts, broadcast and media, historical sites, heritage, libraries, museums, sports, and theatre. See Noonan (2002) for additional discussion of the scope of the literature.
2. q represents the good in question for the CV survey. It may be public or private and can be represented as a vector of attributes, $\mathbf{q}$, especially for surveys using conjoint analysis. The scalar form is used here for simplicity.
3. Depending on the sampling techniques, appropriate sample weights can be applied to derive population estimates.
4. Payment cards and other multiple-bound formats basically involve respondents indicating in which interval their WTP lies (e.g., \$0–\$10, \$11–\$20, \$21–\$50, above \$50).
5. Sequential formats can identify tendencies of respondents to always choose "yes" (yea-saying) or to base their WTP on the first bid presented (starting point or anchoring bias).
6. All price values have been converted to 2002 US\$.
7. Of the 72 studies identified, four could not be located, two did not publish WTP estimates comparable with the other studies, one is only available in Italian. The remaining 65 studies often reported WTP measures for multiple goods, using multiple sample frames, and multiple instruments. The meta-analysis treats these different goods and samples for which a consistent WTP measure is reported as observations. Thus, for example, Bille Hansen's (1997) Royal Theatre study provides two observations, one for the "no information" and one for the "information" sample.
8. "Benefit transfer" is the application of valuation estimates derived from other goods to a good lacking its own data.
9. When a study reports several mean WTP estimates for the same good based on the same sample, only the primary estimate, as indicated by the authors, or most conservative estimate is used. Five observations reported only median WTP measures. In the meta-regressions that follow, to make these WTP values consistent with the other (mean) estimates, a mean WTP was estimated using a simple OLS regression of mean WTP on median WTP and a constant for the remaining 124 estimates. This follows the method suggested by Horowitz and McConnell (2002). To maintain consistency across WTP measures, only values reported as (Hicksian) willingness-to-pay for a change in some state, site, or program are considered. This rules out a few studies, such as a contingent behavior study that derived a consumer surplus measure and a study identifying revenue-maximizing price. Included, however, are WTP estimates that do vary (sometimes widely) in terms of the good in question, whether the payment is to avoid a loss, WTP by households or the individual, or WTP annually or a one-time payment. Despite considerable efforts to control for these differences with other variables (via fixed effects), substantial diversity remains. This variation in the dependent variable arguably undermines the usefulness of Models 1–4, although the ratio used in Table VI escapes some of these inconsistency problems.
10. Intercept surveys sample individuals who are walking about, often at busy intersections or upon entering or exiting a site.
11. These sorts of models are vulnerable to simultaneity problems, where the value and other characteristics of the good influence the methods chosen and vice versa. Some of the selection bias, where unobserved survey and goods characteristics are not independently distributed over studies, is addressed by the random effects model. Yet if the true structural meta-regression model has WTP, METHOD, and GOOD determined simultaneously, the estimates in Tables V and VI will be inconsistent. Instruments for this endogeneity, perhaps leveraging knowledge of survey

method costs or availability of substitutes, may improve estimation. A more narrowly defined sample, such as museum admission fee studies only, may also reduce endogeneity problems.

12. The consistency problem appears in the heterogeneity in the cultural resources analyzed and in the valuation concept reported in studies. See Note 9 for remarks on the consistency in valuation concept across estimates. Heterogeneity in the resource valued admittedly remains a major concern here. Regardless, heterogeneous resources such as picnicking, big-game hunting, and downhill skiing (Rosenberger and Loomis, 2000); pens, visibility, and nuclear waste repositories (Horowitz and McConnell, 2002); and breast cancer reduction, safari tours, and firewood collection (Carson et al., 1996) have been usefully combined in meta-summaries.
13. This may be explained by a selection bias that occurs if high value projects merit higher quality surveys (which the NOAA variable proxies). Although, as shown in Model 4, controlling for cost in those studies for which cost estimates are available does not diminish the positive association between NOAA and WTP.
14. Kling et al. (2001) test for information effects on WTP values by varying the amount of background description about the good. Riganti and Scarpa (1998) find that additional information helped respondents disentangle the complex goods in question, improving the internal consistency of their responses.
15. Cost and the TellCost $\times$ Cost interaction are highly correlated ($\rho = 0.72$), and their coefficients are jointly significantly different from zero. The variance inflation factor for the interaction term is only 5.09, however, raising only moderate concern about multicollinearity. These results are consistent with information bias operating along the lines of Throsby and Withers (1986): cost information yields lower mean WTPs. In light of the small sample size, the results in Table V should be interpreted with caution.
16. Regressors were chosen based on prior beliefs as to which variables would best predict the ratio. Sample frame variables were included because different samples (e.g., users, visitors) may exhibit different value distributions. Elicitation formats can influence value distributions, as open-ended formats or private payment vehicles can elicit some large values. Goods characteristics related to the variance in WTP values (private use goods, heritage goods, and scale measures) were also included.
17. The statistical estimation techniques used by the researchers can also explain the differences between mean and median WTP. Different methods (e.g., parametric and nonparametric) and distributional assumptions can influence the mean and median values reported. The analysis used here does not control for these differences. It also does not incorporate differences in response rates, which are sparsely reported. Future research should incorporate this.

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