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Ex ante and *ex post* valuations of a cultural good. Are preferences or expectations changing?

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In recent years valuations of cultural goods and services have been undertaken using the contingent valuation method, because of its flexibility and the advantages it affords over other methods of valuing non-market goods. Yet, in contingent valuation literature few studies have addressed the reliability of the outcomes. This is the goal of the current paper, which presents the results of an application of the contingent valuation method to a new museum of contemporary art (Museo Patio Herreriano de Arte Contemporáneo [Spanish Contemporary Art Museum] in Valladolid, Spain). The method was applied at two different times: prior to its opening and after some years. We thus aim to contrast the evolution of preferences and willingness to pay (WTP) estimates at different points in time using bootstrap techniques. Estimations were performed using non-parametric methods and the outcomes reflect stability for valuations made by visitors to the museum but not for the valuations given by residents of Valladolid.

Keywords: willingness to pay; contingent valuation; dynamic analysis; museum economics

1. Introduction

The contingent valuation method has been applied for over four decades as a means of obtaining the economic value of non-market goods. Its use is grounded on its enormous flexibility to adapt to a variety of areas and situations, its capacity to take account of differing kinds of values, and the technical improvements to emerge from the ongoing theoretical and empirical work into this valuation method (Alberini and Kahn 2006). As a result, it enjoys the support of a range of national and international organisations and agencies as a procedure for acquiring useful information for valuing non-market resources, particularly property linked to the environment.

One of the most widespread fields of application is the valuation of public goods, namely those which are deemed to fulfil the requirements of non-rival and non-excluding consumption, and whose optimal provision in the market proves difficult, despite the benefits they offer to both actual, as well as potential, consumers. For this reason, the contingent valuation method has been used in numerous applications in

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environmental economics as well as in the area of cultural and heritage economics, particularly since the 1990s (Navrud and Ready 2002, Noonan 2003, EFTEC 2005). In most cases, these goods are deemed public or semi-public, in addition to which they provide an intangible value linked to their symbolic or aesthetic significance which cannot be adequately expressed in terms of price. Valuation estimates undertaken in relation to these goods provide an insight into the role of voluntary contributions in cultural policies, offer useful information to justify the implementation of intervention or conservation policies, give support for cultural management or, at the very least, reflect stated public preferences regarding cultural assets.

The usefulness of this method, as well the overwhelming number of applications, should not, however, blind us to the fact that it has its limitations (Mitchell and Carson 1989, Hausman 1993, Portney 1994, Carson *et al.* 2001). The debate surrounding contingent valuation has brought to light certain relevant problems, prominent amongst which are the complications involved in securing an accurate estimate of stated preferences due to biases linked to individual behaviour, such as strategic bias or hypothetical bias,[1] the question format and definition of the payment vehicle,[2] the problem of embedding,[3] and finally issues related to verifying the reliability and validity of the results being processed in the study in hand. Yet, many of these shortcomings may be atoned for through exhaustive survey design and fieldwork on the subject matter being valued, following NOAA (Arrow *et al.* 1993) recommendations, and implementing the various corrective measures for biases. Whatever the case may be, the controversy has only served to streamline the approach and enhance its applications.

As pointed out, one of the key, and at the same time most widely addressed, issues in contingent valuation exercises is reliability analysis of the outcomes, seen as the analysis of the long-term stability of valuations. This is the goal of the present paper, applied to a cultural good, specifically a contemporary art museum. From the theoretical standpoint, reliability analyses for contingent valuation exercises basically follow two lines (Bateman *et al.* 2002): using the test-retest method on a single sample, or using two independent samples that are similar in composition. The test-retest method may be applied whenever it is possible to survey the same respondents on two separate occasions, with a sufficient time lapse to ensure that, in general, they are unable to recall the initial valuation they gave. Examples of this type of approach include Loomis (1989, 1990) who deemed a nine-month gap in estimations to be a reliable period; the study by Teisl *et al.* (1995) who conducted pre-tests and post-tests on control groups and found five months to be a reliable separation for the study; and McConnell *et al.* (1998) who tested the stability of their estimations, using a prior test to ensure that data, spread over a two-month period, do not evidence any *carry-over effect*.[4]

The other option for verifying the reliability of a contingent valuation study is to apply the same valuation tool to two distinct samples separated over time. The earliest studies along these lines, based on a comparison of mean values, are those by Reiling *et al.* (1990) and Carson and Mitchell (1993). Downing and Ozuna (1996) tested the reliability of the benefit function transfer approach using contingent valuation methods. The studies of Carson *et al.* (1997, 2003) into passive use valuations for the case of the Exxon Valdez, tested the reliability of value estimations after removing the impact of inflation, using different samples separated by a two-year period and conducting prior homogeneity tests for responses to the valuation question. Berrens *et al.* (2000) compared WTP

estimations in two samples separated by a period of one year and those of a joint sample, and reported no significant differences between them. In other studies, Whitehead and Hoban (1999) allowed a longer period of time to elapse and detected significant differences in estimations separated by a five-year period, reporting that these were due to changes in the explanatory variables. Whitehead and Aiken (2007) conducted a reliability analysis using five surveys spread over an extremely long period, between 1980 and 2001, with large samples and methodological changes in question format. Finally, prominent in the area of culture is the work by Riganti and Willis (2002) in which a reliability test is conducted between two samples separated by a two-year period.

To date, very few reliability studies have been carried out, particularly in the area of culture. Thus, the main contribution of this work is to conduct a reliability analysis of the contingent valuation results to emerge from a study into a contemporary art museum, following the second approach mentioned, in other words, using independent samples separated over time. The case study, taken as a prototype valuation, is the Museo Patio Herreriano de Arte Contemporáneo Español in Valladolid (Spain), which boasts one of the most outstanding collections of modern Spanish art, housed in a historical building of major artistic value.[5] The reliability analysis for the estimations over time draws on two populations: visitors to the museum, who display a specific interest or curiosity for contemporary art, evidenced by the fact that they actually visit the museum; and citizens of Valladolid, who witness an increase in the cultural and tourist facilities available in the city, as well as redevelopment of the city centre. The time periods compared are the time the museum opened and three years later.

The work is split into five sections. The second section describes the methodological approach used in the study. Section three offers the outcomes of the contingent valuation exercise. Section four discusses the main findings to emerge from the reliability analysis conducted, and finally section five provides the main conclusions that result from the study.

2. Methodological approach

Based on the fact that the official opening of the Museo Patio Herreriano de Arte Contemporáneo Español took place in June 2002, the fieldwork is set out in two stages (Figure 1). During the initial phase, our goal was to obtain the valuations corresponding to citizens of Valladolid in the weeks prior to the museum's inauguration, as well as museum visitors in the months immediately following. In the second phase we repeat the valuations with data collected three years after the museum's opening. *Willingness to pay* (WPT) was proposed as an annual donation which, amongst other things, would entail certain benefits regarding admission to the museum and, therefore, as a provision of public goods with aliquot donations among consumers and other stakeholders.

The four surveys were conducted randomly by four trained surveyors who gathered the information at various times of the day, on different days of the week and at the periods mentioned. Surveys conducted amongst residents of Valladolid (*Valladolid 1* and *Valladolid 2*) were carried out at seven different locations, spanning a wide part of the city, thus ensuring a broad cross-section of all areas was covered, whereas visitors to the museum (*MPH 1* and *MPH 2*) were approached as they left the museum.

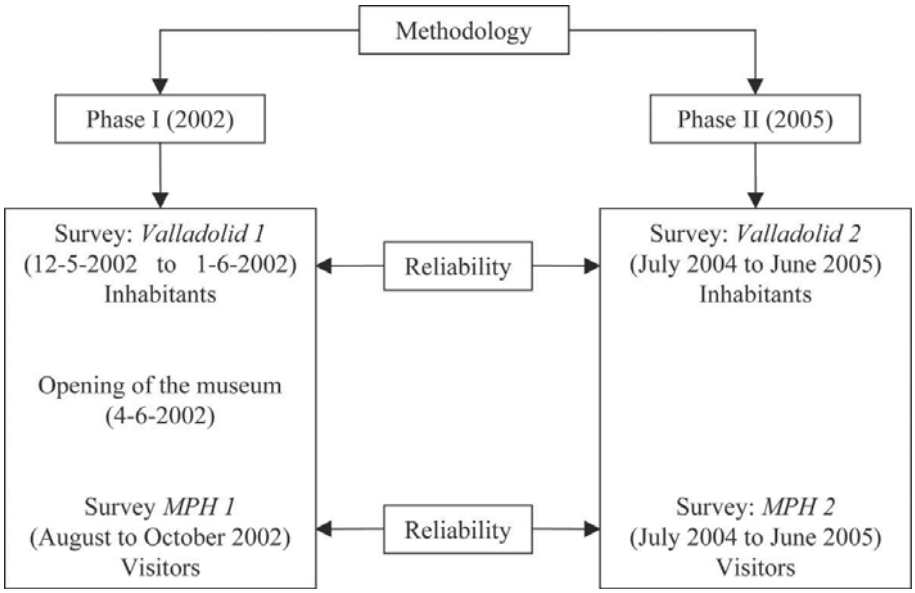

Figure 1. Methodological approach.

All the surveys were similar in structure, commencing with a series of questions concerning the interviewees' cultural consumption habits in order to ascertain their affinity with the good being valued. This was followed by the main part of the survey, which sought to determine their willingness to pay. In our research we enjoyed the strategic advantage that the setting is linked to an improvement in the city's cultural facilities through a new museum, the like of which has never been witnessed before in the city of Valladolid. After a brief introduction, the hypothetical contingent valuation scenario is clearly and specifically outlined, detailing what is being valued and how payment would be made, namely through an annual donation quota.[6] Evidently, in the survey conducted prior to the museum's inauguration (*Valladolid 1*) the valuation question for a good which may not yet be visited is framed with the help of a selection of photographs, both of the building as well as some of the most representative artworks exhibited. During the second stage of the research, photographs were shown only to those who were not previously aware of the museum's existence.[7]

Based on the four surveys, we obtained non-parametric estimations of the mean WTP for visitors and residents at the two phases of the study, with which we then conducted the reliability analysis. Following the approach of Carson *et al.* (1997, 2003) and Jakus *et al.* (2006), we first checked the homogeneity of the distributions of interviewees' responses for each of the bids at the two phases of the study, using a chi-2 test. We subsequently performed means differences comparisons for the WTP values obtained at the two phases of the study. Since non-parametric estimations hinder this type of comparison, at this point we opted to apply bootstrap techniques.

3. Results of the contingent valuation exercise

The first group of results to emerge from the research is the one to come from application to the case study. The method involves positing a hypothetical market in which interviewees can express their maximum WTP for a variation in the amount or quality of the cultural facilities available. It is a direct approach dealing with stated

preferences, which is sensitive to our study scenario, the question format and payment vehicle.

In this research, we used the double-bounded dichotomous choice format followed by an open-ended question for the valuation question. The use of the dichotomous format has become widespread largely due to the NOAA recommendation, in the sense that it endows contingent valuation studies with greater methodological rigour (Arrow *et al*. 1993). The double-bounded dichotomous choice format, introduced by Hanemann (1985), has the advantage that it circumvents starting point bias and proves more efficient than the simple model since, as interviewees receive more information, estimate variance of WTP is reduced (Hanemann *et al*. 1991). However, the approach involves greater complexity in the estimates (Haab and McConnell 2002) and allows possible biases linked to iteration (Alberini *et al*. 1997, Carson *et al*. 2001).

Initial bids offered to respondents through a closed question vary in each case and are allocated randomly in order to avoid, as far as possible, anchoring bias in the estimates. The amounts proposed in the first question were calculated based on the annual contributions made by the country's most representative *Friends of the Museums* associations,[8] the scale of initial bids specifically being: 6, 15, 30, 45, 60, 90 and 150 euros. Depending on the first response given by the interviewee, the second closed question was then posed, offering the amount immediately below when a negative response was given; and immediately above in the opposite case. Finally, all those interviewed were asked an open-ended question in which they had to state their final maximum WTP.

With regard to the WTP estimate process, contingent valuation studies, which use the double-bounded dichotomous choice format, formulate the two valuation questions consecutively, giving rise to four possible responses (No-No, No-Yes, Yes-No, Yes-Yes), which split the monetary interval into four smaller intervals. Thus, the WTP value cannot be directly observed, and what is obtained is the monetary interval which bounds it for each individual. In order to undertake estimates of the WTP distribution, parametric models based on normal or logistic distribution for the error terms were initially used, yielding a probit or logit model respectively. To avoid the problem of a negative willingness to pay, truncated and subsequently non-negative distributions such as lognormal and log logistic were used. An (2000) proposed another solution to this problem involving the use of a Weibull model for WTP distribution, conditioned by a series of observable factors. However, data do not always stand up to this type of supposition since, depending on the assumed distribution, significant differences might emerge in the estimate of the expected WTP value and in tail behaviour (Haab and McConnell 2002). Models used often tend to be unimodal, offering extremely poor adjustment, particularly when explanatory variables are categorical, and the problem worsens if the format of the study yields data grouped into regularly censored intervals (Sanz 2004). As a result, non-parametric estimate methods have been developed, which do not require any suppositions as to the functional shape of the WTP distribution.[9]

The early non-parametric algorithms proposed to estimate the survivor function for samples with incomplete information, as occurs for example when data are grouped into intervals, are those posited by Ayer *et al*. (1955) for simple binary data, and the Kaplan and Meier (1958) approach for right-censored or interval-censored data. Turnbull's self-consistent algorithm (1974), and above all its widespread application (Turnbull 1976), heralded a major step forward for this type of approach

when data are left-censored, right-censored or censored at regular intervals. Finally, the algorithm proposed by An and Ayala (1996) generalised Turnbull's self-consistent algorithm to deal with arbitrarily grouped data, a commonly adopted approach to economic analysis of public good valuation.

The information gathered was filtered to remove inaccurate or incoherent responses, and to pinpoint protest values in order to consider only those respondents who genuinely accepted the proposed contingent market. We adopted a conservative approach, as there is a certain amount of controversy regarding censorship of protest zeros, initially defended by Mitchell and Carson (1989) and Whitehead *et al.* (1993), yet currently under discussion in recent research such as Jorgensen *et al.* (1999), Strazzera *et al.* (2003) or Dziegielewska and Mendelsohn (2007). In our case, respondents who expressed a null WTP were asked why; the only ones to be included being those who stated that they already contributed through payment of taxes or those who expressed a wish to contribute, but said they were unable to do so at that point. However, reasons such as "only those interested should pay", "I don't believe in that kind of contribution", "I'm not interested in such matters" or "I prefer to give my money to other social causes", were deemed protest values, as they did not accept the hypothetical market scenario. Table 1 shows this information for the four surveys.

By applying the An and Ayala algorithm to the responses to the double-bounded dichotomous choice format question we were able to calculate the empirical survivor function, which represents the demand curve for the Museo Patio Herreriano stated for the various samples, and thus determine consumer surplus value as an estimation of the maximum willingness to pay. The value estimations provided by the museum visitors (*MPH 1* and *MPH 2*) were 25.32 euros in the initial survey and 23.88 in the second, whereas for the valuations given by the city's inhabitants, the results were 21.39 euros and 14.14 euros, respectively. Tables 2 and 3 and Figures 2 and 3 show the main results concerning the density and survivor functions. By way of a summary, Table 4 shows comparative results for the four surveys performed, removing the influence of inflation.[10] Outcomes differ at each phase, but do they differ enough to warrant being deemed as radically dissimilar? To find an acceptable answer to this question we must perform a reliability analysis.

4. Reliability analysis

With regard to the main purpose of our study and the various phases of the methodological approach posited to assess reliability of WTP estimations using independent samples, we first tested the homogeneity of the response distributions for each bid at the two phases of the study. For each initial bid, we thus created a

Table 1. Valid surveys and percentage of protest zeros in the four studies.

	Survey	Valid surveys	% of protest zeros
Phase I (2002)	*Valladolid 1*	766	15.27%
	MPH 1	485	15.51%
Phase II (2005)	*Valladolid 2*	588	26.04%
	MPH 2	437	25.55%

Table 2. WTP distribution (Visitors to the MPH 1 and MPH 2).

	MPH 1		*MPH 2*	
Initial bid	Survivor function S(x)	WTP estimation	Survivor function S(x)	WTP estimation
0	0.6196	0.00	0.6499	0.00
3	0.5691	0.15	0.5975	0.16
6	0.3933	1.06	0.4315	1.00
15	0.3246	1.03	0.3066	1.87
30	0.2490	2.27	0.2036	3.09
45	0.1880	2.75	0.1539	2.24
60	0.1152	4.38	0.0889	3.90
90	0.0334	7.38	0.0525	3.27
150	0.0143	2.86	0.0053	7.09
240	0.0000	3.44	0.0000	1.26
		25.32		23.88

Table 3. WTP distribution (Valladolid 1 and Valladolid 2).

	Valladolid 1		*Valladolid 2*	
Initial bid	Survivor function S(x)	WTP estimation	Survivor function S(x)	WTP estimation
0	0.6759	0.00	0.5828	0.00
3	0.6533	0.07	0.5591	0.07
6	0.4728	1.09	0.3723	1.12
15	0.3316	2.12	0.1934	2.68
30	0.1634	5.05	0.1020	2.74
45	0.1255	1.71	0.0777	1.09
60	0.0679	3.46	0.0295	2.89
90	0.0294	3.47	0.0147	1.33
150	0.0000	4.42	0.0000	2.21
240	0.0000	0.00	0.0000	0.00
		21.39		14.14

contingency table, allowing us to determine whether the percentages of Yes and No responses were the same at the two periods considered, an approach we repeated for the double-bounded dichotomous format with the four possible responses: Yes-Yes, Yes-No, No-Yes and No-No.

Homogeneity analysis of the distributions for the two periods studied failed to find evidence of any significant differences, bearing in mind that our question format consists of seven initial bids, the homogeneity hypothesis being rejected in only two bids of each of the two large groups of people surveyed (visitors and residents). Tables 5 and 6 show the results of the χ^2 comparisons carried out.

During the second phase of the reliability study, a comparison of the difference between the mean WTP values at the two phases of the study needs to be performed. To construct confidence intervals or hypotheses contrasts, the standard errors of the mean WTP values need to be calculated. When using the double dichotomous format, the second response may depend on the first (Haab and McConnell 2002),

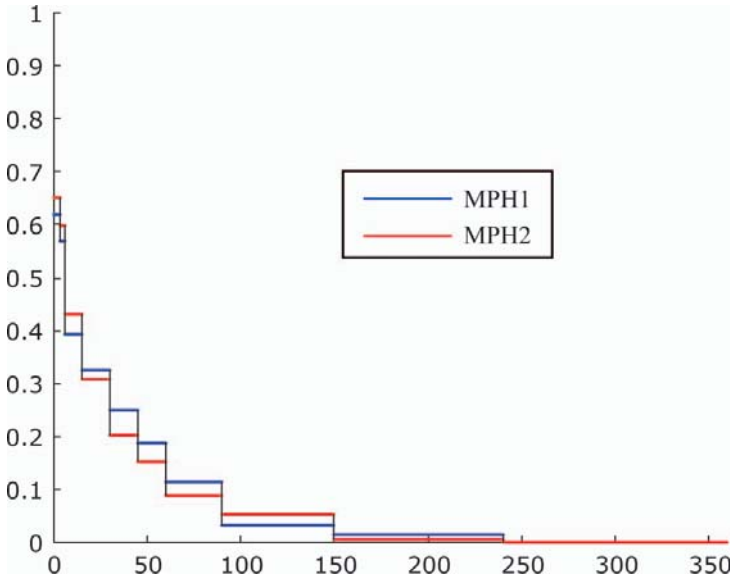

Figure 2. (Colour online) WTP survivor function (*Visitors to the MPH 1 and MPH 2*).

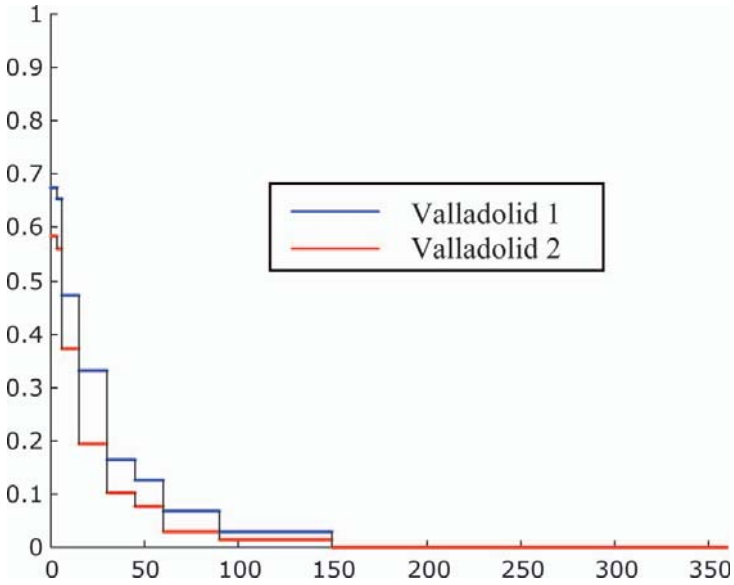

Figure 3. (Colour online) WTP survivor function (*Valladolid 1 and Valladolid 2*).

Table 4. Deflated WTP based on June 2002 CPI.

	Phase I		Phase II	
	n	WTP	n	WTP
Visitors	485	25.32	437	21.77
Citizens	766	21.39	588	12.89

and in the case of the lower bounded estimator for the mean we have used, to date no estimator for variance has been found. One way to solve the problem is to use bootstrap techniques. The Fisher permutation test proves particularly suited for

Table 5. Homogeneity comparisons of the response distributions for the valuation question (*MPH 1* and *MPH 2*).

Bids	χ^2 statistics. First response (p-value)	χ^2 statistics. Two responses (p-value)
6	2.7273 (0.0986)	3.8660 (0.2763)
15	1.0125 (0.3143)	3.8087 (0.2829)
30	2.4634 (0.1165)	2.9020 (0.4070)
45	0.0005 (0.9822)	1.3409 (0.7194)
60	2.3022 (0.1292)	4.4066 (0.2208)
90	0.4815 (0.4877)	12.2577 (0.0066)*
150	1.0667 (0.3017)	11.5632 (0.0090)*

Note: *Values rejecting the homogeneity hypothesis at 95%.

Table 6. Homogeneity comparisons of the response distributions for the valuation question (*Valladolid 1* and *Valladolid 2*).

Bids	χ^2 statistics. First response (p-value)	χ^2 statistics. Two responses (p-value)
6	0.6396 (0.4239)	2.2429 (0.5235)
15	0.3650 (0.5457)	2.8739 (0.4115)
30	13.7934 (0.0002)*	13.8484 (0.0031)*
45	1.5312 (0.2159)	10.6970 (0.0135)*
60	0.3465 (0.5561)	6.0084 (0.1112)
90	3.3492 (0.0672)	7.3047 (0.0628)
150	0.6222 (0.4302)	3.0194 (0.3886)

Note: *Values rejecting the homogeneity hypothesis at 95%.

comparing the difference between means required in this study (Efron and Tibshirani 1998).

Fisher's permutation test is based on a consideration of the data from the two phases ordered together. A sample the same size as that from the first period (*MPH 1* or *Valladolid 1*) is then drawn randomly without replacement, whilst the remaining data form a sample which is identified with that from the second period (*MPH 2* or *Valladolid 2*). Estimating the corresponding WTP by means of the An and Ayala algorithm and repeating the procedure B times, gives B means differences which are identified with the bootstrap distribution of the difference in means. If the behaviour of the two samples compared were the same, the mean value of the distribution would be around zero.

A comparison of the mean WTP values corresponding to museum visitors at the two phases of the study (*MPH 1* and *MPH 2*), applying this procedure (see Table 7), indicates that the difference of 3.55 euros to emerge after correcting for inflation is not significant and that therefore this slight drop in valuations should be viewed within a situation of general stability. We may therefore conclude that museum visitors display preferences which remain constant over time, reflected in the stability of their valuations. Such a small variation in results over this time period may be a result of the impact caused by the opening of the museum.

By contrast, the valuations made by the inhabitants of Valladolid from the first to the second stage of the study differ by 8.5 euros after correcting for inflation, and

Table 7. Results of Fisher's permutation test for comparing WTP (*MPH 1* and *MPH 2*).

	MPH 1		*MPH 2*
Sample sizes	485		437
Estimations of WTP for June 2002	25.32		21.77
Bootstrap distribution of mean difference		Min −9.2690 Max 10.3773	
p-value		0.2370	

Table 8. Results of Fisher's permutation test for comparing WTP (*Valladolid 1* and *Valladolid 2*).

	Valladolid 1		*Valladolid 2*
Sample sizes	766		588
Estimations of WTP for June 2002	21.39		12.89
Bootstrap distribution of mean difference		Min −8.8157 Max 9.7557	
p-value		0.001	

applying Fisher's permutation indicates, in this case, that the drop in valuations is clearly significant (see Table 8). This leads us to think that citizens are not exhibiting any clear taste for the museum, but rather are expressing their perception of its importance as one of the city's cultural and tourist attractions, together with the opportunities it affords for urban redevelopment. In this case, what clearly emerges is a drop in values stated by residents. When explaining this, both the expectations created when the museum was opened, as well as the efficiency and successful management of the new facility, may be determining factors.

5. Conclusions

Applying the contingent valuation method to assess cultural heritage is justified by the absence of any relevant markets which can adequately reflect the scarcity, cost or demand for these goods. Furthermore, the application of this approach to the specific case of a museum is interesting, because it aims to reflect the latter's value as a consumable cultural good and as a public facility, able to impact on the urban landscape of the city and enhance the city's appeal as a tourist attraction. The interest thus lies in estimating the valuations of specific visitors to the museum and of residents directly affected by the new amenity, in addition to assessing the stability of these results over time.

The valuations obtained in this research are indicative of the tremendous appreciation shown by residents and visitors to the museum for this type of good or cultural service. The empirical results bear out the reliability of the value allocated to the museum visitor estimates, as these remain stable over the time period considered. The survey data reveal that museum users display a high cultural level and the valuations underpin the fact that visitors clearly evidence established likes and tastes, vis-à-vis contemporary art, meaning they are able to manifest their willingness to pay coherently over time in a contingent valuation exercise.

However, in the case of the value declared by residents of Valladolid, estimates have fallen substantially. This may be due to the two samples not being linked by any cultural interest, but merely being related by virtue of belonging to the same city. Ordinary citizens thus include the new prospects offered by the museum in their valuations, and reflect the novelty of the cultural facility, the image of the city it projects to the outside world, and the possibilities it opens up as a cultural tourist attraction, and so on. This process whereby certain expectations are generated clearly influences both the underlying ideas with regard to the anticipated effects of the new cultural facility, and the implementation of these functions over time, therefore reflecting society's appraisal of the public management of the new institution. In our case study, it should once again be highlighted that there has been a significant fall in citizens' valuations, probably related to a fracturing of the expectations created or to a certain sense that the expected impact of the museum has not materialised.

Interesting conclusions for cultural management and planning may be drawn. Indeed, adopting the hypothesis of a museum or art collection having a certain cultural value and assuming its interest to potential visitors to remain constant, management of such an institution should not confine itself to the facilities, but should extend further to embrace possible financial impact, social projection or intangible effects (image, symbolism, etc.). Managers should take account of these other factors, not only as a further aspect of social responsibility, but also as a means of securing new or complementary resources in the form of sponsorship or donations.

To summarise, contingent valuation exercises which contain a dynamic element prove useful to illustrate how visitors' valuations of a cultural good respond to specific tastes which remain stable over time, whereas valuations made by citizens are linked to the expectations which stakeholders form with regard to the cultural good as a public endowment, the evolution of which over time is determined by the efficiency of the related results expressed.

Notes

1. Strategic bias emerges when respondents fail to reveal their true WTP for tactical reasons, such as proposing a higher amount if they feel that the study may influence decision-making policy, or proposing a lower amount if they feel that they will be able to enjoy the good whether they pay or not. Hypothetical bias is possible error caused when an individual is not faced with a real situation, and therefore tends to overestimate valuations (Mitchell and Carson 1989, Bateman *et al*. 2002).
2. There are different question formats, although recent specialised literature recommends the dichotomous choice format. Likewise, the vehicle of payment should be realistic and suited to the situation proposed so that the valuation exercise is not rejected (Mitchell and Carson 1989, Carson *et al*. 2001).
3. Embedding bias tends to occur when a set of goods is being valued. The valuation for the total does not tend to be the sum of the valuations of the parts (Bateman *et al*. 2002, Alberini and Kahn 2006).
4. This effect involves respondents recalling the answer they gave in the initial survey, and using it as an indication or repeating it the second time around.
5. See www.museopatioherreriano.org.
6. Other similar research studies have made proposals such as monetary contributions to a foundation managing activities linked to the cultural asset being valued, an increase in taxes to contribute to activities of a cultural nature, or fixing prices which would cover expenses. We opted for a proposal similar to the first, which is more in line with the legal status of the institution managing the Museo Patio Herreriano, a non-profit

organisation dependent on public and private funding to implement its cultural objectives.

7. The museum's location is well known to the inhabitants of Valladolid, as it is one of the cloisters of the Monastery of San Benito, an emblematic heritage site in the city which is over 400 years old. Moreover, people were aware of this new cultural facility, as evidenced by the fact that 93% of those interviewed during the initial survey knew of its existence.
8. In relation to this question we consulted the quota paid by the Friends of the Queen Sophia National Art Centre (65€), National Sculpture Museum (30€), the Valencian Institute for Modern Art (36€), the Prado Museum (70€), and so on.
9. In the area of cultural asset valuation, few studies employ non-parametric estimates in contrast to the widespread use of parametric approaches. For some applications, see Cuccia and Signorello (2002), Sanz *et al.* (2003), Del Saz and Montagud (2005), Báez *et al.* (2009).
10. Using the consumer price index (CPI) issued by the Spanish National Institute of Statistics to adjust for price increases since 2002, estimated at 1.097.

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