

Economic valuation of a contemporary art museum: correction of hypothetical bias using a certainty question

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Abstract Biases in contingent valuation exercises are often difficult to quantify and to correct due to the hypothetical nature of the method itself. One common problem is hypothetical bias, which in recent years has been addressed in various ways, particularly through the inclusion of a certainty question in the questionnaire. We analyse the impact of applying differing corrections based on the certainty question for double-bounded dichotomous economic valuation exercises. The empirical application is based on data gathered from four surveys conducted with various groups to obtain the value allocated to a modern art museum: the Museo Patio Herreriano de Arte Contemporáneo Español, in the city of Valladolid (Spain). Findings indicate that estimates of Willingness to Pay are significantly reduced when a higher certainty threshold is required, in other words when individuals are more certain of their choices. Furthermore, correction through recoding proved more severe than correction through exclusion.

Keywords Cultural economics · Valuation of public goods · Contingent valuation · Willingness to pay · Hypothetical bias

JEL Classification Z11

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1 Introduction

Contingent valuation has proved to be one of the most useful and well-adapted methods for ascertaining the value of non-market goods and services. Modification and refining of the approach, undertaken in the wake of widespread criticism in the early nineties, boosted research based on this method and provided the spur needed for its extensive use as an assessment tool. Since then research has notably widened its focus and grown in intensity, the application of contingent valuation to the evaluation of cultural goods and services becoming particularly important given the important similarities between this and the field of environmental resources, where the approach has long been in use.

Progress in contingent valuation in the field of culture is mainly due to enhanced evaluation techniques, but also to the growing importance attached to cultural goods by individuals and institutions alike, as well as to a greater awareness of the transactions linked to public provision for cultural goods (Noonan 2003). Although the contingent valuation approach was first applied to the field of culture in the early eighties (Throsby and Withers 1983 and Thompson et al. 1983), the compilation studies of Mourato and Mazzanti (2002); Pearce et al. (2002); Noonan (2002, 2003), and EFTEC (2005) evidence that most studies have been conducted since the nineties, mainly in the United States, Canada and the United Kingdom, with more scant research contributions from the rest of Europe.¹

Progress in the field of contingent valuation studies aims to enhance tools for gathering information, improve estimation procedures and seek means of limiting or eliminating possible biases inherent in the approach. One relatively common problem is hypothetical bias, which tends to lead to an overestimation of willingness to pay. Hypothetical bias may be defined as potential error arising from an individual not being faced with a real situation (Schulze et al. 1981). The difference between the values obtained in a contingent market and those which would actually emerge, were an explicit market to exist, is the goal of studies addressing hypothetical bias. The pertinent literature contains many examples of “laboratory experiments” which have offered various ways of comparing hypothetical with real behaviour.²

Numerous reasons explain the discrepancy between declared value and real value (Champ et al. 1997; Berrens et al. 2002 and Murphy et al. 2005). At times, this may be due to free-rider behaviour or to the personal satisfaction derived from contributing to the good in question. However, on other occasions respondents may not have entered the market, may lack sufficient experience, or respond before correctly formulating their willingness to pay. They may give uncertain answers, or may simply not be prepared to devote the necessary time to answering.

¹ Examples include those published by Bille Hansen (1997); Santagata and Signorello (2000); Cuccia and Signorello (2002); Sanz et al. (2003); Sanz (2004); del Saz and Montagud (2005) as well as other works reflected in the book by Navrud and Ready (2002).

² Vossler and Kerkvliet (2003) conducted a thorough review and classification of existing works.

Whatever the case, hypothetical bias has been evidenced in valuations of both public³ and private⁴ goods. Moreover, the panel of experts who drew up the National Oceanographic and Atmospheric Administration (NOAA 1994) report issued urgent calls for further research to be conducted in this area. Since then many researchers have devoted their efforts to seeking calibration functions and correction methods aimed at restricting or completely eliminating discrepancies between real and contingent values. This has led over the last ten years to abundant scientific literature addressing the topic,⁵ which has posited various solutions but which has thus far failed to provide any generally accepted conclusion.

Our study aims to apply various corrections to hypothetical bias based on a certainty question posed in the contingent valuation questionnaire. Section 2 of this paper assesses how the issue of hypothetical bias has been addressed in the literature, and Sect. 3 has an empirical application to a cultural good. The final section offers conclusions.

2 Correcting hypothetical bias in the contingent valuation method

A review of the literature aimed at correcting hypothetical bias reveals that to date five main kinds of approach have been adopted, which we summarise below:

- One of the earliest methods used to counter hypothetical bias was to posit corrections before the problem arose. This led to proposals such as an insistence on reminding the respondent of budget restraints and available substitutes of the good being valued (Loomis et al. 1994, Neil et al. 1994, Neil 1995, Loomis et al. 1996 and Azjen et al. 2004). Respondents were even encouraged to answer as if payment were actually to be made, and were explicitly reminded of hypothetical bias and informed as to its possible causes. Using the term Cheap Talk,⁶ Cummings and Taylor (1999) included a script in the survey designed specifically to counter the effect of hypothetical bias.
- Other possible ex ante solutions include Wang (1997) who proposes extending the dichotomous format by offering the chance to answer *Don't know*, the author feeling that a *Don't know* response represents the point of indifference since, as the price increases, typical respondents who would initially say *Yes*, will change to *Don't know* and later to *No*. Alberini et al. (2003) criticise this model as they believe that the *Don't know* response may indeed indicate uncertainty or a lack of interest and a rejection of the hypothetical market which should therefore be

³ See Brown et al. (1996); Cummings et al. (1997) and Cummings and Taylor (1999).

⁴ See Neil et al. (1994); Cummings et al. (1995); Loomis et al. (1996) and List (2001).

⁵ For a thorough review of this question, see Berrens et al. (2002); Samnaliev et al. (2006) and the meta-analysis on hypothetical bias conducted by List and Gallet (2001) and Murphy et al. (2005).

⁶ *Cheap Talk* does not seem to prove effective if short (Cummings and Taylor 1999, Poe et al. 2002; Aadland and Caplan 2003 and Brown et al. 2003) and when applied to respondents lacking experience (List 2001). Recent studies advocate applying this approach with caution, Aadland and Caplan (2006) evidencing that short and neutral *cheap talk* may increase bias rather than reducing it. Blumenschein et al. (2008) conclude that the effectiveness of *cheap talk* is low in comparison to other procedures that include different levels of certainty as a means of correcting hypothetical bias.

excluded. For their part, Carson et al. (1994) propose counting *Don't know* responses as *No*, since these people would answer *No*, if forced to make a choice at that moment.

- A further step in this kind of correction involves the use of polychotomous choice models with several uncertainty categories: *Definitely yes*, *Probably yes*, *Don't know*, *Probably not*, *Definitely not*. This type of model has been explored by Ready et al. (1995) and Welsh and Poe (1998), in most cases recoding *Don't know*, and *Probably not* to *No*.⁷ One variation in this approach was applied by Whitehead et al. (1998) using a question of this kind sequentially: if the yes or no response is immediate, it is coded as a definite yes or no, and if not, an alternative intermediate option is offered.
- Amongst ex post solutions, one initial approach used in the field of experimental economics consists of locating calibration factors. In this vein, Mansfield (1998) obtained results for contingent valuation studies using open dichotomous choice questions, and List and Shogren (1998) employ market goods. Findings from the meta-analysis conducted by List and Gallet (2001) and Murphy et al. (2005), concur with the conclusions to emerge from the work of Harrison and Rutström (2005), which posits that the mean hypothetical values are 2.5 to 3 times higher than real values, although the distribution of the calibration factor is highly asymmetrical, and the corresponding ratio for the medians is close to 1.5.⁸ Finally, a thorough review of this and other questions related to hypothetical bias may be found in Harrison (2006).
- Finally, ex post solutions can be based on a follow-up question assessing the level of certainty with which the response to the contingent valuation exercise has been given. This was first posited by Champ et al. (1997), and applied by other researchers such as Ethier et al. (2000); Champ and Bishop (2001) and Poe et al. (2002) using scales from 1 to 10. The problem surrounding this method which is yet to be overcome is the issue of where the optimum cut-off level lies for the certainty scales.⁹ Li and Mattsson (1995) and Loomis and Ekstrand (1998) view the certainty question as the likelihood of contributing with the amount specified in the question.

In this article, we propose an empirical application in which we use the certainty question to assess variation in the willingness to pay for a cultural good, dependent on the level of certainty expressed by individuals in their responses. Both exclusion and recoding of *Yes* to *No* answers in cases of low certainty for the simple dichotomous question format are approaches which have been applied in laboratory experiments, although no such study has been carried out for double-bounded dichotomous, as is the case posited in our research.

⁷ Other authors to use qualitative scales include Blumenschein et al. (1998) and Johannesson et al. (1998).

⁸ The initial recommendation to be found in NOAA (1994) posits the well-known “divide by 2” rule except when real market data are known.

⁹ Champ et al. (1997) use 10 as a cut-off value, Thompson et al. (2002) use 9, Champ and Bishop (2001) 8 and Poe et al. (2002) and Vossler et al. (2003) use 7.

3 Empirical application

Numerous cultural heritage assets are often deemed public goods since they are non-exclusive and non-rival. This means that nobody may be prevented from enjoying the good and that consumption of such a good by any individual does not diminish other people's chances of consuming the same good. When these two conditions are not strictly proven to concur we are faced with semi-public goods. In either case, consumers lack any incentive to pay for such goods, since if they do, they are aware that others who do not pay will also benefit, and that if they themselves do not pay they cannot be prevented from enjoying the good. Moreover, there is no incentive to either provide or maintain these goods, since anybody who does is generating a value for which they will not be rewarded, and a value which is not adequately reflected through market prices.¹⁰

Museums may particularly be considered as public or semi-public goods, since on many occasions they are excludible as a result of charging an entrance fee¹¹ and their consumption is non-rival (except for specific cases in which a problem of congestion may exist). In these situations, and as we are dealing with non-market goods, contingent valuation method has proved useful for making economic valuations, which is why we apply it to our particular case study.

Specifically, our valuation study assesses the Museo Patio Herreriano de Arte Contemporáneo Español (Spanish Contemporary Art Museum) in the city of Valladolid (Spain). This museum, opened in June 2002, constitutes a commitment to a cultural policy of avant-garde art in a city steeped in historical heritage. The Contemporary Art Collection houses representative works of Spanish art dating from the early 20th century to the present day donated to the museum and displayed through an agreement with the City Council, who in turn provided the facilities, which form part of the Monastery of San Benito, an emblematic heritage ensemble in the city centre.¹² The museum is managed in an original way, at least in what is the Southern European or Latin setting in which most museums are public. By contrast this is a private collection on display in a public building managed jointly through a non-profit foundation.¹³

This is the setting which provides the approach and aim of our research work, consisting of an evaluation of this new cultural facility by visitors, local residents and those who are possibly interested in contemporary art. We also seek to correct the hypothetical bias inherent in this kind of valuation through an analysis of a certainty question. The empirical application in this research was performed through four surveys, two of which were conducted with visitors to the museum, one with residents of Valladolid and another with visitors to the Madrid International

¹⁰ We refer to passive use values originating from cultural heritage: option value, legacy value and existence value. See Navrud and Ready (2002) and Snowball (2008).

¹¹ In Spain 45.6% of museums are free (See Sect. 3.13 of the Internet address <http://www.mcu.es/cultura/base/cgi/um?L=0&N=&O=pcaxis&M=%2Ft11%2Fp11%2Fa2002%2F>).

¹² See <http://www.museopatioherreriano.org>.

¹³ In Spain, around two-thirds of museums are public, and the remaining third private with only 2% being a combination of the two, as is our case study. Over half of the museums in Spain are free and those which are not charge a symbolic price. The entrance fee for the Museo Patio Herreriano is three euros.

Contemporary Arts Fair (ARCO). As explicit consumers of this cultural good, surveys with visitors to the museum were carried out at two different moments, firstly between June and October 2002, in other words, during the months the museum was first open, and subsequently after it had been running for three years, when the possible impact effect of its inauguration had dissipated. At this latter stage, residents of Valladolid were also surveyed as a group influenced by the new cultural facilities available in the city. Finally, in February 2005, we surveyed visitors to the ARCO Fair who, as people either keen on modern art or experts in the field, would be able to provide valuations for such a specific group. Throughout this study the denominations used to refer to the four surveys are *MPH 1* and *MPH 2* for visitors to the museum during the first and second stage of the study, respectively; *Valladolid 2*, for residents of Valladolid and, *ARCO* for visitors to the International Contemporary Arts Fair in Madrid.

Surveys were conducted through personal interviews, which yielded a high rate of participation, above 90%. Visitors to the museum were interviewed as they left (*MPH 1* and *MPH 2*). Visitors to the ARCO fair were interviewed during their visit, and residents of Valladolid were questioned by interviewers at seven different locations which spanned a range of areas, thus ensuring residents from all over the city were interviewed. The most salient features of the contingent valuation exercise are the use of an annual voluntary donation as the vehicle of payment,¹⁴ the use of the double-bound dichotomous question format, and WTP estimates assessed using nonparametric methods, specifically the An and Ayala algorithm (1996).¹⁵ As it is non-parametric, the estimation method used requires no supposition regarding the WTP distribution, and merely entails knowledge of the monetary interval of the interviewees' responses in line with the proposed initial bid.¹⁶ To avoid starting point bias, we used seven initial bids of (6, 15, 30, 45, 60, 90 and 150 euros) chosen at random for each interviewee.¹⁷ The An and Ayala algorithm (1996) provides the empirical survival function linked to the declared preference data and the WTP estimator is the mean value calculated conservatively using the lower extreme of each interval.

¹⁴ In other words, in the manner used for funding public goods through aliquot contributions, deemed acceptable when valuing historical heritage and museums. See Bravi et al. (2002), Sanz (2004) and Báez (2006). The specific valuation question used in our research was: "Suppose that a special fund were to be set up to help finance the conservation and maintenance costs of the Museo Patio Herreriano and its activities. Suppose also that contributions to said special fund were to be made through a single annual donation. Bearing in mind the previously described situation, would you be willing to pay X € as a contribution to this special fund for the conservation and maintenance of the Museo Patio Herreriano?". When affirmative answers were given, a higher amount was proposed and when a negative answer was given a lower amount was proposed.

¹⁵ For the full algorithm see An and Ayala (1996). For its application here, we used a specific Matlab program which may be consulted in Sanz (2004).

¹⁶ Sanz et al. (2003) perform parametric, semi parametric and non-parametric estimations in several contingent valuation exercises, findings from which proved robust and similar across the different methods.

¹⁷ The amounts proposed in the valuation question were calculated on the basis of the annual amounts paid by the most representative *Friends of the Museums* associations in Spain. We consulted the annual friends quotas paid for the Museo Nacional Centro de Arte Reina Sofía (65 €), Museo Nacional de Escultura (30 €), Instituto Valenciano de Arte Moderno (36 €), Museo del Prado (70 €), etc.

Zero protests, in other words interviewees whose response was zero due to a refusal to accept the valuation exercise, were eliminated using a question relating to the reason for the null response. The only zero responses to be included in the study were those who expressed a wish to take part in the market but whose valuation was zero either because they were unable to contribute at that time despite wishing to or because they felt they were already participating through payment of taxes.¹⁸ The main data and findings from the four valuation exercises are summed up in Table 1. Figures are inflation adjusted as surveys were conducted in different years.¹⁹

On the basis of these results, we now assess how interviewees' willingness to pay and their behaviour vary depending on the certainty with which they confirm the stated amount in the contingent valuation exercise. In no way is our purpose to find the cut-off point on the certainty scale as there is no real or pseudo real market with which to draw a comparison. Rather, we wish to explore the effect of applying various kinds of corrections aimed at ascertaining the truthfulness and certainty of respondents' answers, and thus examine how hypothetical bias is dealt with in contingent valuation exercises.

The *certainty question* was included in the survey after interviewees had stated their maximum willingness to pay and was posed on the suspicion that some respondents were being easily drawn into hypothetical bias, since it is quite usual to respond affirmatively when asked to cooperate on cultural issues, particularly when there is no real commitment to pay or any habit of doing so. Sub-samples were formed on the basis of the original data, grouping together those interviewees whose stated certainty was greater than or equal to one, greater than or equal to two, and so on. WTP estimates in each of these groups fell as the required level of certainty increased, as respondents stating a zero WTP are extremely sure of their answer, and therefore strongly weight the value zero, as opposed to those who expressed a positive WTP, who were not always so certain.²⁰ In this study, we thus posit two approaches to deal with hypothetical bias: correction by exclusion or correction by recoding low certainty responses.

The first idea we propose to mitigate hypothetical bias is to remove from the estimates those interviewees who evidence uncertainty in their responses, in other words, only to include observations which the interviewer feels offer a reasonable degree of certainty, unless a real reference market exists. We thus eliminated respondents who accepted the contingent valuation exercise but who were not sincere or sure of their answer, and included the exact response of interviewees who seemed reasonably credible. Using this criterion leads to a substantial reduction in

¹⁸ The full range of possible answers to questions were: (1) I already contribute through my taxes, (2) Those who are most interested in such things should pay, (3) I don't believe in this kind of contribution, (4) I'm not interested in such issues, (5) I'd like to but at the moment I can't, (6) I prefer to give my money to other causes. As pointed out, only answers (1) and (5) were deemed real zeros, whereas the rest were interpreted as protest responses.

¹⁹ To obtain the adjusted data we used the Consumer Price Index drawn up by the Spanish National Statistics Institute.

²⁰ Champ and Bishop (2001) point out that respondents who give a positive WTP with low certainty are responsible for hypothetical bias.

Table 1 Summary of adjusted WTP estimates at June 2002

	Sample size	Protest zeros (%)	Adjusted estimates
MPH 1	485	15.51	25.32
MPH 2	437	25.55	21.77
Valladolid 2	588	26.04	12.89
ARCO	287	39.83	33.53

Table 2 WTP estimates according to level of certainty. Correction by exclusion. (Constant prices at June 2002)

	MPH 1	MPH 2	Valladolid 2	ARCO
Certainty = 1 or more	23.80	21.36	12.83	33.53
Certainty = 2 or more	23.42	21.05	12.33	32.43
Certainty = 3 or more	23.35	21.17	12.35	32.43
Certainty = 4 or more	22.55	21.27	12.37	32.06
Certainty = 5 or more	21.86	21.41	12.34	30.59
Certainty = 6 or more	19.88	19.35	11.00	28.05
Certainty = 7 or more	17.94	17.82	9.91	26.43
Certainty = 8 or more	13.51	14.18	7.97	21.49
Certainty = 9 or more	10.65	9.67	5.86	20.19
Certainty = 10	8.50	8.31	4.29	14.30

sample size, which in our case might reach around 40% were we to maintain only those whose certainty level was deemed to be 10.

Table 2 and Fig. 1 show in detail the mean WTP estimations for the various levels of certainty and for each valuation scenario. Summarising the results, the diminishing WTP when a greater level of certainty is required can be seen in the four surveys analysed. Findings also evidence the remarkably similar behaviour displayed by interviewees in the museum in the two phases of the study (*MPH1* and *MPH2*) and the strikingly disparate behaviour of residents of Valladolid and visitors to ARCO. It is noticeable that if we only consider valid answers from individuals whose declared certainty was exactly 10, valuations would prove extremely low, as they would fall by at least 60% in comparison to the general estimates in all the surveys except ARCO. If we take a certainty of ≥ 7 , which seems a fairly credible level in intuitive terms, valuations would be around 10 € for residents of Valladolid, around 18 € for the museum visitors at the two stages of the study, and approximately 26 € for those surveyed at ARCO.

The second proposal we use for correcting hypothetical bias in this application is a modification of the criterion used by Champ et al. (1997), Champ and Bishop (2001) and Poe et al. (2002), and is based on recoding low certainty responses. In these laboratory cases, the contingent valuation exercise used a simple dichotomous question format, such that recoding merely involved changing uncertain *Yes*

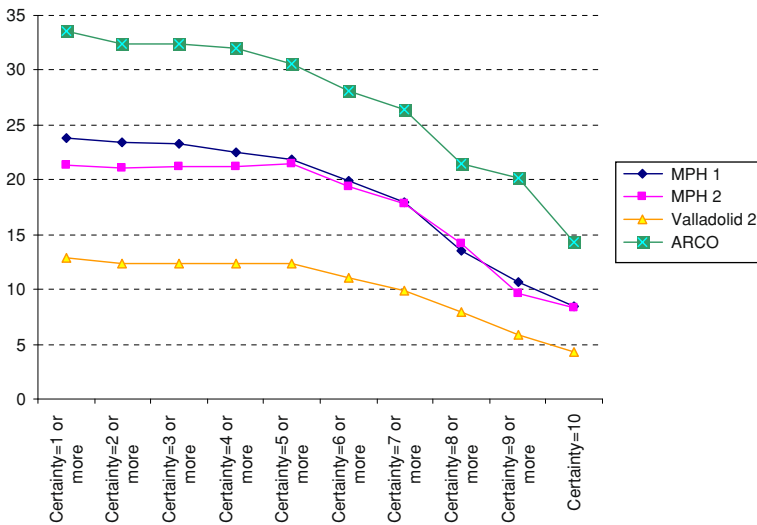


Fig. 1 WTP estimates corrected by exclusion. (Constant prices at June 2002)

answers to *No*. These are asymmetric uncertainty models, since only the Yes answers are recoded, whereas the Nos remain unaltered.²¹

In our case study, we use the double-bounded dichotomous format, and recoding is slightly more complex. For each initial bid t , respondents may answer yes, in which case they are then offered a higher amount t_s . If a negative answer is given, a lower amount t_l is offered. Responses thus fall into one of the four intervals into which the monetary range is divided: $(0, t_l)$, (t_l, t) , (t, t_s) and (t_s, ∞) . In our proposal for correcting hypothetical bias, if an interviewee with low certainty accepts a proposed bid, in other words replies *No-Yes*, *Yes-No* or *Yes-Yes*, the stated WTP in the intervals (t_l, t) , (t, t_s) or (t_s, ∞) , is recoded such that it is grouped within the intervals $(0, t_l)$, $(0, t)$ or $(0, t_s)$ respectively, as the true willingness to pay is deemed lower than is actually stated, whereas the No-No responses remain unchanged.

The advantage of the proposed method is that individuals who accept the contingent valuation exercise remain in the study, whereas uncertain responses are gradually penalised. WTP estimates with this correction can be seen in Table 3 and Fig. 2, as can the way estimates evolve depending on the interviewees' certainty as responses are gradually recoded. When taking ≥ 7 certainty cases as reasonably reliable, we note the significant reduction in estimates, which come out at around 14 € for visitors to the museum in both phases of the study, 8 € for residents of Valladolid and 20 € in the case of those visiting ARCO.

The general trend is similar with the two corrections applied. In other words, up to a certainty of five or six, WTP falls slightly, partly because the percentage of interviewees who state a low certainty WTP (between 1 and 5) is small. Yet, when

²¹ Loomis and Ekstrand (1998) also feel that hypothetical bias is mitigated when recoding only uncertain Yes answers.

Table 3 WTP estimates according to level of certainty. Correction by recoding. (Constant prices at June 2002)

	MPH 1	MPH 2	Valladolid 2	ARCO
No recoding	23.80	21.36	12.83	33.53
Recoding certainty = 1	22.59	20.65	12.26	31.03
Recoding certainty = 1–2	22.01	20.55	12.26	31.03
Recoding certainty = 1–3	20.87	20.43	12.20	30.47
Recoding certainty = 1–4	19.73	19.86	11.95	28.92
Recoding certainty = 1–5	15.96	15.93	9.52	24.00
Recoding certainty = 1–6	13.60	13.78	7.91	20.45
Recoding certainty = 1–7	9.62	10.17	5.72	14.77
Recoding certainty = 1–8	7.00	6.16	3.88	12.23
Recoding certainty = 1–9	5.60	5.13	2.71	7.89

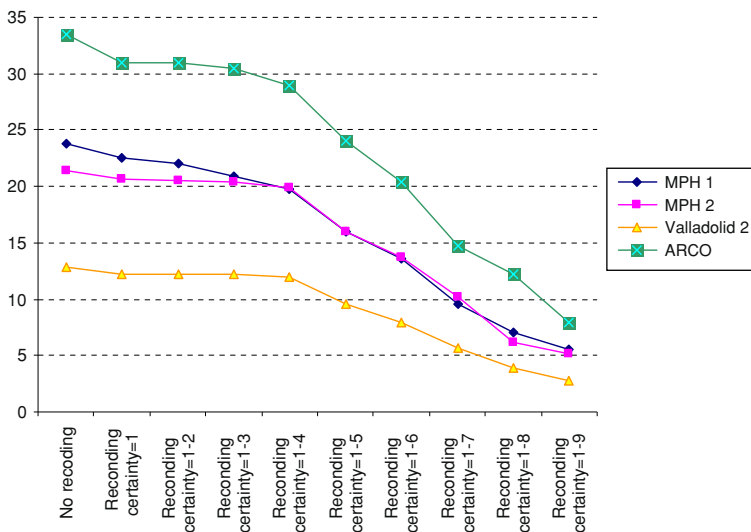


Fig. 2 WTP estimates corrected by recoding. (Constant prices at June 2002)

the level of certainty is seven or above, the drop in WTP estimates is much greater, correction through recoding being much more pronounced than through exclusion.

Finally, by using the χ^2 statistic, we then analyse the degree of dependency between the interviewees' sociodemographic features and the level of certainty to ascertain which factors might impact the latter. With the certainty scale used and bearing in mind that after seven the certainty level is fairly high,²² various contingency tables were posited. Table 4 shows the variables used and Table 5 the *P*-values corresponding to the contrasts performed.

²² The use of scales from 1 to 10 is quite common for valuation, and in other studies which employ the same scale a cut-off point of 7 has been used (Poe et al. 2002 and Vossler et al. 2003), 8 (Champ and Bishop, 2001), 9 (Thompson et al. 2002) or 10 (Champ et al. 1997).

Table 4 Variables used

Variables	Values
Certainty	Low (1–6)/High (7–10)
Sex	Male/Female
Association (membership of a cultural association)	Yes/No
Educational background	Basic Secondary/Upper secondary or Vocational Training/Degree/ PhD or Master
Cultural consumption (No. of strictly cultural visits made over the last year)	Low (0–3)/Medium (4–10)/High (over 10)
Age	Young (up to 26)/Adult (27–50)/ Elderly (over 50)
Income	No income/Up to 1,800 €/Over 1,800 €

Table 5 *P*-values of the tests of the contingency tables (certainty versus sociodemographic variables)

	MPH 1	MPH 2	Valladolid 2	ARCO
Sex	0.7465053	0.1278384	0.4028142	0.1921931
Association	0.9244738	0.0062726*	0.7205883	-
Educational background	0.2284907	0.1358279	0.2218568	0.6537346
Cultural consumption	0.9983392	0.0738279	0.1363111	0.4561947
Age	0.0082316*	6.866E-05*	0.0000011*	0.0054610*
Income	0.7589494	0.0487117*	0.6216882	0.9421908

* Significant at level 5%

The only variable which seems to be linked to the level of certainty in the four studies is age. Several tests were carried out with the other variables grouped into a varying number of categories, none of which proved to be significant. Only in survey MPH 2 was any significance also found in membership of a cultural association and income. As a result, sincerity and certainty amongst interviewees when responding to a contingent valuation question seem to be a form of behavior linked only to individuals' maturity, as the older interviewees are the more common it is to find responses with high levels of certainty.

4 Conclusions

This work focuses on the valuation of cultural goods as stated by certain groups, using the contingent valuation method and tackling the problem of hypothetical bias by adopting two approaches for the certainty question: by excluding individuals who lack certainty in their responses or by conservatively recoding their responses.

This exercise is applied to a bounded and clearly stated cultural prototype, namely a contemporary art museum.

The findings to emerge from the general valuation are coherent with the groups to which they correspond, since the lowest estimates coincide with the residents of Valladolid, where the museum is located (12.89 €), enthusiastic at the prospect of new cultural facilities but not necessarily displaying any particular preference for it. This is followed by the valuation given by actual visitors to the museum itself (25.32 € and 21.77 €), people who express an explicit interest in this kind of cultural consumption and who moreover evidence a certain stability over time in their valuations. Finally, the highest estimates are stated by visitors to ARCO (33.53 €), where the interviewees, who are not linked to the city of Valladolid, form a group of experts or people interested in the works on display in the Museo Patio Herreriano. The findings to emerge subsequent to the proposed corrections are reasonable since in both cases they reduce estimates as the required level of certainty increases. It must be taken into account that respondents stating a null WTP are extremely sure of their answer. It can also be seen that correction through recoding is stricter than through exclusion. To sum up, we may conclude that in this valuation exercise estimates have fallen by around 22% when considering only cases of certainty ≥ 7 and by 40% when recoding them. This is an innovative finding for avoiding overestimation of outcomes in contingent valuation and for possible use in management of cultural institutions as well as assessment of cultural policy projects.

Finally, we also sought to provide an explanation for the behaviour of individuals who displayed greatest certainty in their responses, the only conclusion being that this was related to age. We therefore feel that this behaviour is not influenced by educational background, income or other sociodemographic variables, but that it merely depends on individuals' maturity and that for this reason higher levels of certainty are more frequent as age increases.

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