USING THE CONTINGENT VALUATION METHOD FOR DOLLAR VALUATIONS OF LIBRARY SERVICES

Philip Hider

An application of the contingent valuation method (CVM) for estimating the economic value of a regional public library service is described, and some of the key methodological issues surrounding CVM and other stated preference techniques are discussed with reference to library use and funding contexts. Given the range of valuations that can result from different forms of question, it is important to only compare resulting benefit-cost ratios based on the same survey design. However, if CVM surveys are carefully designed and administered, they can produce estimates that are as convincing as those produced by other valuation methods. It was found that the Wagga Wagga City Library, in New South Wales, Australia, provides good value for the money, in line with that of other comparable studies in the United States and Norway.

Introduction

Library managers find it hard to place dollar values on their services and collections and instead usually base their evaluations on internal units of measurement. Such evaluations are often heuristic in nature, pointing to improvements or potential improvements; sometimes, they are comparative across libraries or across a particular type of library; but rarely do they attempt to compare the worth of a library with that of another type of institution. Nevertheless, the reality is that libraries are generally funded at the expense of other institutions and departments. However much a library may improve its services, it is still competing against other worthy causes. A unit of measurement that affords comparison with these other causes is the dollar.

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In recent years, as pressures on public spending have increased, there has been renewed interest in valuating nonmarketed goods and services. Economists have developed and refined various stated preference (SP) techniques to produce estimations of the value of products and services, were they to be marketed. These techniques have been primarily applied to environmental issues (e.g., how much is a clean river worth?) but are now being applied to many other situations, including the maintenance of publicly funded cultural and educational institutions. This article examines their potential to library managers in supporting their budgetary claims in light of one particular implementation, namely, a valuation of a regional public library in New South Wales, Australia.

Literature Review

Stated Preference Techniques
Stated preference techniques are used by economists to estimate values when preferences cannot be revealed through the demand for goods and services at particular prices. Instead, the economist surveys the potential market—specific groups of people or the public at large—and asks individuals to state their preferences. There are two main types of stated preference technique: contingent valuation (CV) and choice modeling (CM) [1]. The former is the more established but perhaps also the more controversial; the latter is a development of conjoint analysis and can be used to valuate aspects of marketed goods and services, as well as nonmarketed goods and services. Essentially, in CV studies, individuals are surveyed to determine how much they would be willing to pay (WTP) for a good or service were they required to pay for it or how much money they would accept in order to forgo the good or service (WTA); in CM studies, individuals are surveyed to determine how much they value particular features of a good or service, or set of goods or services, through their choices of particular combinations of attributes [2]. In all cases, hypothetical scenarios are described and responses elicited. The success of these techniques is thus dependent on realistic, or near-realistic, answers.

It should be noted that “contingent valuation” is sometimes defined more broadly, particularly outside of economics, to include other, non-SP methods used to estimate the monetary value of nonmarketed goods and services, such as the travel cost method (e.g., by José-Marie Griffiths, Donald King, Thomas Lynch, and Julie Harrington [3] and by Roxanne Misingham [4]). However, in this article, the contingent valuation method (CVM) is defined as per the previous paragraph.

The CV method came to prominence in the 1980s and early 1990s as a means of valuing environmental damage and, in particular, the damage
caused by the Exxon Valdez disaster [5, p. 1]. A panel of experts convened by the National Oceanic and Atmospheric Administration (known as the NOAA Panel), which examined the validity of the method in this case, found in its favor but also made a series of recommendations for its future application [6]. The recommendations, which have been summarized by Paul Portney [7, p. 9], set the benchmark for subsequent CV studies [8]. One key recommendation was to use a referendum-style question based on WTP rather than WTA. In such a question, the respondent is asked to vote on whether a levy of $X$ dollars is to be charged for a particular good or service. Giving those surveyed a discrete choice in their response to a particular scenario is generally considered to reveal demand more accurately, a view that has also led to the development of the (discrete) CM method, in contrast to other forms of conjoint analysis, where respondents are asked to compare features and goods, for example, by ranking them [9].

The majority of CV and CM studies have been carried out in the field of environmental economics. A typical application would be the valuation of areas of Kakadu National Park in Australia [10]. However, in the past decade or so, the technique has been used to produce cost-benefit analyses of a range of public services [11, p. 3]. Noonan identifies over sixty CV studies of “cultural” goods and services, including historic monuments, theaters, museums, and libraries [12].

Like many other methods used in economics, CV and CM techniques are controversial. Some economists argue that their validity remains unproven, though the generally accepted line is that the extent of their validity is very much dependent on the particular context in which they are applied and how they are applied. Studies comparing actual and stated WTP have shown that respondents tend to overstate WTP [13], and there have been several techniques developed for correcting this. Other important methodological questions have been raised and continue to be debated; some of them will be discussed later in this article.

**Valuations of Library Services**

Dollar valuations of library services have not been commonly undertaken, although there have been more of them in recent years. There have thus been few cost-benefit analyses reported in the literature, where the direct economic benefit of a service is compared with its direct cost. Some of the cost-benefit analyses that have been reported turn out to be for marketed goods, such as in library book sales and consortium purchases [14–15]. The problem of assigning monetary values to nonmarketed services is not one on which librarians have made many inroads; F. W. Lancaster has remarked that it is “exceptionally difficult, if not completely impossible, to express the benefits of library service in monetary terms” [16, p. 294].
Nevertheless, Missingham has identified two recent “waves” of library evaluation where the aim has been to quantify the benefit derived by the end user [4]. The first of these waves examined information services’ contributions to their parent organizations, often in the corporate sector. The value of these services was estimated according to how many dollars the service saved on labor costs. Although such studies make it clear that information services do significantly increase efficiency, Missingham observes that they “did not seem to fully convince managers or stakeholders of funding models for libraries or information centres” [4, p. 144]. Moreover, these studies tended to overlook other ways in which organizations benefited from information services, such as by increasing work effectiveness.

A more recent wave of studies identified by Missingham emerged in the 1990s and took “a broader view of the value of libraries” [4]. While many of these evaluations compare various component services in nonfinancial terms, they all attempt to produce quantitative data that can be employed by management when funding allocation decisions need to be made. Missingham considers “the high point of this wave” to be those studies based on the notion of “return on investment” [4, p. 144], where the funding of a service is compared with the overall economic benefit it provides its users—in dollar terms. In a few recent examples, dollar values are complemented by values derived from social and environmental indexes so that the “triple bottom line” (social, financial, and environmental) is examined [17].

Some of these return-on-investment studies have also recognized the indirect economic benefits, known as multipliers, that libraries make to the economy, such as the wages they pay their staffs [17]. Such studies thus go beyond the basic cost-benefit analysis, which limits itself to direct costs and benefits, and instead define “return on investment” more broadly, adding together direct and indirect benefits to produce often significantly greater values [3, 18–22]. Usually the multipliers are estimated according to sophisticated economic models. However, CVM is a technique designed to estimate direct benefit only, and so this review focuses on the narrower, direct cost-benefit analyses of library services.

Many of the cost-benefit analyses in this new wave have not, in fact, used CVM but other techniques for estimating direct benefits, even though they are sometimes referred to as “contingent valuation” methods. Such methods include the travel cost method; surveying users’ demand for alternative, commercially available services; and applying preexisting, general estimates of particular economic gains [3, 18–22]. Indeed, only three of the studies cited by Missingham used SP techniques as their primary, or one of their primary, methods [4].

One of the most notable examples of a CVM application was undertaken by consultants employed by the British Library, who found that the overall
benefit of its services to the British public was around 4.4 times the funding the library receives from the government [23]. The survey employed a range of question types—WTP, WTA, investment in access, price elasticity in demand, cost of alternatives—and focused on those key services considered likely to generate the most value.

In the mid–late 1990s, Glen Holt, Donald Elliott, and Amonia Moore employed a combination of methods to estimate a benefit-cost ratio for public libraries in St. Louis, Missouri, ranging from about 2 : 1 to 10 : 1, depending on county [24]. They surveyed library cardholders by telephone, incorporating one WTA question with a referendum scenario and one open-ended WTP question. However, a large minority of respondents refused to answer the WTA question. Responses to the WTP question led to a value-for-money conclusion, but the benefit-cost ratio—about 1 : 1—was much smaller than it was using the other techniques. Although Holt, Elliot, and Moore claimed that the estimate derived from the WTP question did not take account of indirect benefits, this might not have been entirely true; householders were free to consider how much they might pay in light of all possible benefits. On the other hand, the scenario was very briefly explained, and respondents may have been unclear as to what was happening to the tax that they were already paying; they were simply asked to pay more. Holt, Elliot, and Moore also employed CVM for their surveys of businesses and schools. When these additional benefits were added to the WTP-derived benefit for general users, the benefit-cost ratio was in the region of 2 : 1.

Holt and Elliot went on to refine their research design for further cost-benefit analyses, demonstrating its portability across various sizes of public libraries [25–26]. Their approach started with the construction of a matrix of user types and services and used CVM to estimate the WTP of the different user types (usually there were only two or three of these) for the library’s services overall; other forms of consumer surplus modeling were used to gauge the benefit of individual services.

Another CV survey of public libraries (not cited by Missingham [4]) has recently been reported by Svanhild Aabø, who estimated that Norwegian public libraries represent, on average, a 4 : 1 benefit-cost ratio [27]. This calculation was based on a mixture of WTP and WTA questions, which produced benefit-cost ratios ranging from a little over 1 : 1 to about 5 : 1.

Three other SP studies have focused on a particular service. The National Library of New Zealand found a 3.5 : 1 benefit-cost ratio in their national bibliographic database through use of a CM survey [28]. Earlier, David Harless and Frank Allen showed that the reference service of Virginia Commonwealth University was value for money, with a benefit-cost ratio, based on existing hours, of 3.5 : 1 [29], while Anne Morris, John Sumson, and Margaret Hawkins used a WTP question on book borrowing as part
of a wider analysis of the value of public libraries in the United Kingdom [30].

The small number of CV surveys of library services suggests that contingent valuation is a method unfamiliar to most librarians, while the newer technique of choice modeling remains almost untested [31]. Those researchers who have used CVM have called for more studies to examine its validity across more economic contexts and to refine its implementation with a view to standardizing its output for the purposes of comparison [24]. As Missingham points out, however, caution needs to be exercised with any comparisons, even with the application of a standardized method: what constitutes a “good” benefit-cost ratio would depend on each library’s funding and user context, and variations may be due to different user needs and values, as well as the quality of services offered [4]. In any case, whatever the benefit-cost ratio, it is worth remembering that this is not necessarily the “best” ratio—there is still likely to be room for improvement.

Public Library Funding Trends

Public libraries are not the only libraries facing budgetary pressures, but they have a particularly difficult challenge in justifying their claims against a wide range of competing services and the broadest of user profiles. Alan Bundy has recently noted that the total local and state government investment in Australian public libraries is $A550 million per annum, equivalent to a mere seven cents per Australian per day [32, p. 2]. He also notes that “for what is invariably its most heavily used and most valued community provision, the individual local government annual investment ranges from less than 1 percent pa of rate revenue to over 7 percent in some parts of Australia. . . . The difference between a poorly staffed, housed, resourced and passive library service providing little more than a lending service, to one that is a proactive contributor to community development, engagement and social capital, may be as little a shift in rate revenue expenditure of 2 percent by a local authority, and a shift in state government annual expenditure of 0.25 of one percent” [32, p. 5].

Australian public libraries are not, of course, the only libraries to be struggling with budgetary pressures. For example, the American Library Association reported that library funding cuts announced in the media since about 2003 had reached US$164 million [33]. Most librarians and many members of the public would no doubt agree with Bundy when he calls for spending increases, rather than budget cuts: “So much remains to be done in improving buildings, book stocks, other resources, services, hours of opening, and particularly specialised library professional and other staff” [32, p. 2].
Research Design

The principal objective of the research project reported in this article was to determine whether or not a cost-benefit analysis of a particular public library service could be undertaken through the use of a stated preference technique. Both CV and CM methods were considered, but although CM might have yielded values for more specific services provided by the library, it was not considered especially suitable for determining the value of the public library as a whole: it would be difficult for respondents to make choices across a disparate array of services that the local council provided, and it would also be difficult for many of them, particularly those who rarely used the library, to make choices across services within the library. Thus, a more straightforward CV survey was developed, conforming as closely as possible to the NOAA Panel recommendations.

The subject of the survey was Wagga Wagga City Library. Wagga Wagga has a population of nearly 60,000 and is the main city of the Riverina region in New South Wales, Australia. The public library is situated in the center of the city; it has no branch libraries. The library is in some ways well-suited to a CV survey, as it is known to many of the city’s population and its “market” is relatively discrete, despite its being the general public; that is, most of its patrons, and targeted patrons, reside in the city and its suburbs. It does, of course, serve the rural population that stretches out beyond the city, but this is a relatively small number, and other significant population centers in the region have their own libraries [34]; although Wagga Wagga attracts a moderate number of visitors from further afield, there is no evidence to suggest that they use the library in large numbers. The Wagga Wagga population is also fairly stable. The council’s investment in the library is about 6.5 percent of its total rate revenue.

Although the NOAA Panel recommended that CV surveys be conducted in person, interviewing escalates project costs and is likely to lower response rates (people often prefer to answer surveys at a time of their own choosing). Interviewing over the telephone was considered, but the survey design made this difficult; the WTP questions were detailed and the possible responses too many. Instead, the survey was administered as a printed questionnaire, introduced in person, but completed in the respondents’ own time.

The NOAA Panel also recommended a sample size of at least 1,000, although many CV surveys sample 100–300 people. The unit of population was in this case the household, and as there are only about 18,000 households in Wagga Wagga (a small population compared with many populations that CV surveys target), a sample of over 300 households was considered sufficient, particularly given that binary logistic analysis with six
potential predictors was to be employed, for which a sample size of 120 is generally enough [35].

The sample needed to be representative of the city's overall population, not just those who use the library, and so the questionnaire could not be distributed at the library. Instead, it was distributed at residences across the city, using a cluster sampling technique based on the city's Australian Bureau of Statistics (ABS) collection districts, in order to achieve reasonable socioeconomic representation. The survey was first piloted in five randomly selected districts, after which twenty-four questionnaires were distributed in each of sixteen randomly selected districts (there are about forty districts altogether).

The library is funded largely by the city council, which derives its income, ultimately, through its rates and charges (a small percentage of the library’s budget comes from the state government). As the council rates are generally charged to householders, rather than to individuals, it was more consistent to survey householders and ask respondents to answer the questions on behalf of their households. There was, in fact, a slight inconsistency in that council rates are paid by property owners and not by tenants, whereas the survey did not make this distinction. However, the vast majority of householders in Wagga Wagga are owner-occupiers, and it is also unlikely that landlords would have radically different views about the city library than would tenants.

The survey was administered to homes in and around Wagga Wagga between May and July 2007. The questionnaires were only distributed to householders who accepted a verbal invitation to complete the form. Within each ABS collection district (which had themselves been selected at random), a location was selected at random from which to commence distribution, whereby adjacent dwellings (mostly houses) on the streets were visited one by one until an invitation was accepted, after which three dwellings were skipped. Dwellings were visited on various days of the week, including Saturdays and Sundays, and at various times of day. Respondents were asked to complete the form and leave it outside their door for collection on an arranged day. If they failed to leave the form, they were reminded of the survey and given a further opportunity to have it collected. Returned (and completed) forms were exchanged for a $5 shopping voucher.

The design of the questionnaire underwent a series of iterations in an effort to cultivate honest and considered responses. The NOAA Panel recommended WTP questions based on hypothetical referenda. It is just about conceivable that the City Council might no longer have the means or inclination to fund its library. In Australia, local government has a statutory obligation to provide library services but can opt out of this obligation in certain circumstances. The city council could, hypothetically,
hold a referendum on the funding of its library, but in order to elicit WTP amounts, the referendum would need to translate a particular level of funding into household rates set aside specifically for the library. Presently, council rates are not broken down into charges for different services, and so this scenario introduces a new charging system that needs to be explained clearly and described as realistically as possible. Individual services would be charged for separately, and if ratepayers did not value a particular service enough, then they could, at least in the case of certain “nonessential” services, vote not to fund it. One problem with the referendum scenario here is that different levels of service correspond to different levels of funding; it is not so realistic to restrict ratepayers’ choice to a vote on a single charge. However, providing voters the option of various charges for various levels of service is not necessarily any more realistic—would the council implement such a detailed referendum on a service that many voters would not be so intimately familiar with?

An alternative might be to describe a scenario in which the library was taken out of the council’s control, that is, privatized. An open-ended WTP question could then be asked: How much would respondents be willing to pay to join the private library? The reason why the NOAA Panel did not recommend this approach was because of the tendency for respondents to overstate their WTP when they were not actually committing any money, even in the scenario. On the other hand, it might be argued that respondents might understate their WTP in attempt to reduce the price, if they really bought into the scenario. In either case, the question is deemed not to be incentive compatible, that is, it does not encourage an honest response.

However, apart from the theoretical issues, there is another difficulty with direct WTP questions; they can be difficult to build a scenario around. Although a few library-oriented CV studies have used open-ended questions supported by payment cards, they were not used in this survey. It was one thing to ask respondents to imagine that the council had a new approach to library funding; it would be another to ask respondents to imagine that a private library had been established, or was being considered, in place of the public library. Indeed, the scenario suggested a different library service, not the public library service that was being valuated.

Referendum-based scenarios were thus selected for the three WTP questions included in the questionnaire. In each scenario, the city council held a referendum on the future of the library, given a new funding system. It was important to make clear to the respondents that they were voting only with respect to the library service and that the outcome had no bearing on any of the other council services. It was also important to make clear that any “library charge” that they ended up paying would go directly to the library (there is a view among some ratepayers that the council squan-
ders money on central administration, research trips, and so forth). But most important, respondents had to be clear that they would not be paying extra rates; the new system meant that the library element of the old rates would be taken out.

Even referendum-based CVM is not theoretically incentive compatible according to some economists [36], and several techniques to correct for this have been developed, such as certainty scales, “cheap talk,” and dissonance minimizing [37]. Certainty scales are used in conjunction with WTP questions to provide an indication of respondents’ hypothetical bias [38]; cheap talk involves making the respondent aware of the danger of overstating their WTP [39]; dissonance minimizing involves providing response options that allow respondents to express support for a service or good without committing dollars to it [40]. Mark Morrison and Tom Brown’s study indicates that dissonance minimizing might be more successful than cheap talk in addressing the problem of overstating and, unlike cheap talk, also appears to affect voting equally across bid levels [37]. As cheap talk could not, in any case, be readily implemented in a questionnaire survey and certainty scales would make the questionnaire significantly more complicated, dissonance minimizing was used to encourage more truthful voting. Instead of a simple Yes or No choice, the No vote was split into four different response options, so that the “ballot” read as shown in figure 1. Given that the rejection options outnumbered the acceptance option 4:1, there was in fact a danger of overcorrection, particularly as this was probably not a topic that might induce great amounts of yea-saying. The WTP questions were thus considered likely to produce particularly conservative estimates of demand, in comparison with just about any other form of CV question.

In a referendum scenario, a set of prices, or bids, has to be chosen so that a demand curve can be determined according to the proportions of acceptances and rejections of the various bids. Six bids were used in this survey, for each of the WTP questions, based on the costs of the library’s services and on responses given in the pilot study. The aim was to have a range of bids that would lie within acceptance rates of 20 percent and 80 percent. The household charge was monthly, considered to be easier to evaluate than a quarterly or annual one. The six bids in the main scenario were $2, $4, $8, $10, $12, and $20 (all dollars stated here are in Australian currency). The bids for the other two scenarios were scaled down according to their lesser costs; in these scenarios, a library with reduced levels of service was proposed.

The NOAA Panel also recommended that protest responses be identified and minimized. Such responses occur when a respondent rejects not the service but the hypothetical scenario. A common cause of rejection is the belief that a particular service should be “free”—that a particular orga-
Contingent Valuation of Library Services

Voting Slip

Proposal: Wagga Wagga City Council levies a monthly library charge of $8 per household.

Please choose ONE of the following options:

☐ I would vote YES to $8 as the monthly charge per household for the library.

☐ I would like to see the library stay open, but can’t afford the $8 monthly charge and so would vote NO to the proposal.

☐ I would like to see the library stay open, but would prefer to spend my money on other things and so would vote NO to the proposal.

☐ I would like to see the library stay open, but would vote NO for the following reason:

[Optional explanation]

☐ I would vote NO to $8 as the monthly charge per household for the library, as I would not mind if the library closed.

Fig. 1.—Sample voting slip in questionnaire survey

...
The questionnaire was also employed to investigate some secondary questions about the use of the library services. Respondents were asked how often they visited the physical library and its Web site, how often they used particular services, what prevented them from visiting the library, and how the library could do better. They were also asked to evaluate the library and some of its key services.

In summary, the research design assumed that most of the benefit gained from the city library’s services is derived by residents in and around the city; that respondents would answer reasonably accurately on behalf of their households; that a sample size of over 300 would be representative of the city’s population; that the WTP scenarios were imaginable and their questions incentive compatible; and that the three questions were not subject to a serious sequencing effect. The design was limited inasmuch as it did not fully adhere to the NOAA Panel’s recommendations, such as its use of a printed questionnaire as opposed to face-to-face interviewing.

However, some of these assumptions and limitations can be evaluated with reference to certain indicators of a successful CV survey, that is, one that accurately reflects demand [8]. First, a reasonable response rate would minimize the danger of underrepresentation of low valuations from non-respondents (those who reject the invitation to take part in the survey are likely, on the whole, to be less interested in the service and thus likely to value it less). Second, a relatively small number of protest valuations would make it less likely that the derived demand model is distorted when these valuations are discarded, even if they hide atypical demand. Third, and probably the most important indicator, is the existence of a valuation function based on certain characteristics of the sample population, which would demonstrate that the residents’ valuations were not random. Thus, the NOAA Panel recommended that the validity of WTP responses is checked through their association with other responses, such as demographic data. To this end, several standard demographic questions were included in the questionnaire in order to construct a demand model based on covariates in addition to price. The validity of the survey results will be discussed with respect to these three indicators.

Results

Although the subject of the survey might not be particularly popular, the personal invitations and $5 incentives encouraged a fairly good acceptance rate and an excellent return rate; a total of 336 forms (87.5 percent) were completed and returned. The number of protest votes, as identified by reasons given where response 4 was chosen, was reasonably low; 3.3 percent for the main scenario. The reasons why the scenarios (and not just the
services) were rejected fell into three categories: some respondents insisted that the service should be “free,” others took the opposite line and wanted only users to pay (whether or not they themselves were users), and some simply refused to accept the new charging system, that is, they did not want to pay for the service directly.

Disregarding the protest votes, the acceptance rates for each bid within the main scenario are shown in table 1. For the most part, voting was sensitive to price.

The demographics of the sample (see tables 2–4) corresponded reasonably well with those of the population, as estimated from recent statistics from the Australian Bureau of Statistics. One marked discrepancy was the ratio of male and female respondents: 73 percent in the sample, as opposed to a population ratio around the 50 percent mark. This bias was corrected for in the subsequent estimations by using a mean for the sex variable that was based on recent ABS census statistics rather than on the sample.

### TABLE 1

<table>
<thead>
<tr>
<th>Main Scenario Bids</th>
<th>$A2</th>
<th>$A4</th>
<th>$A8</th>
<th>$A10</th>
<th>$A12</th>
<th>$A20</th>
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<tr>
<td>Yes</td>
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<td>30</td>
<td>20</td>
<td>31</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
<td>23</td>
<td>37</td>
<td>27</td>
<td>31</td>
<td>45</td>
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<tr>
<td>Yes (%)</td>
<td>69.0</td>
<td>56.6</td>
<td>35.1</td>
<td>53.4</td>
<td>31.1</td>
<td>16.7</td>
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### TABLE 2

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<th>Age (Years)</th>
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<td>18–19</td>
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<td>20–24</td>
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<td>80–84</td>
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<tr>
<td>85+</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>317</td>
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TABLE 3

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<th>Level</th>
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<td>No schooling</td>
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<tr>
<td>Primary</td>
<td>6</td>
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<tr>
<td>Year 10</td>
<td>68</td>
</tr>
<tr>
<td>Year 12</td>
<td>55</td>
</tr>
<tr>
<td>Diploma</td>
<td>97</td>
</tr>
<tr>
<td>College degree</td>
<td>94</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>321</td>
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In order to estimate the mean WTP, as represented by the sample, binary logistic regression was used. This regression technique is based on a dichotomous (binary) dependent variable; in this case, representing acceptance and rejection of a particular bid. To construct a demand model, other covariates beside price were tested for fitness against the dependent variable: responses to age, sex, children, education, and income were considered. For the main scenario, the optimal model involved the factors of price, sex, education and income, as the addition of these covariates to the model, unlike the other covariates, reduced the $-2 \log$ likelihood, which is used to measure fitness. Price was clearly the biggest factor on whether the proposal in the scenario was accepted or not, as shown by its much higher Wald statistic (see table 5). The optimal model was a statistically significant improvement on the null model (the chi-square test giving a $p$-value of less than 0.001)—in other words, the voting was not random. Furthermore, similar testing also showed that the additional demographic

TABLE 4

<table>
<thead>
<tr>
<th>Annual Joint Income</th>
<th>n</th>
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<td>Range ($A$)</td>
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<td>0–6,238</td>
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<tr>
<td>6,239–10,399</td>
<td>7</td>
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<tr>
<td>10,400–15,599</td>
<td>17</td>
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<tr>
<td>15,600–20,799</td>
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<tr>
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<tr>
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<tr>
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<td>36,400–41,599</td>
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<td>41,600–51,999</td>
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<tr>
<td>78,000–103,999</td>
<td>47</td>
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<tr>
<td>104,000+</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>288</td>
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</table>
covariates included in the optimal model were also statistically significant, even if not as large a factor as price.

The mean WTP was estimated as the sum of the regression coefficients (commonly referred to as the B coefficients) of the three demographic factors in the optimal model (see table 5, col. headed “B”) multiplied by their respective means (see table 5, last col.), plus the constant, divided by the coefficient for price. (As noted earlier, the mean for the sex variable was adjusted according to a closer estimate of the population mean based on recent ABS statistics.) Since the relationship between price and acceptance was inverse, the price coefficient was negative and thus reversed in the calculation. The calculation is given below:

$$\text{Mean WTP} = \frac{0.548 \times 0.48 + 0.359 \times 4.65 + 0.090 \times 8.41 - 1.622}{0.129} = 8.27$$

The result was thus a mean WTP of $8.27 per month. If this is multiplied by the estimated number of households in the city (17,756), the total benefit derived by the residents of Wagga Wagga is estimated as $1,762,105 for the year. Estimations for the other two scenarios were lower, as would be expected, and will be published elsewhere, as are responses to other, secondary questions included in the survey.

In order to perform the cost-benefit analysis, relevant costs were calculated based on a breakdown of the current budget, with the assistance of the city library’s manager. The study assumes that the library’s current level of spending on its services provides for approximately the level of service that the city’s residents are used to (the manager of the library considered this to be the case). The study also assumes that most of the benefit derived from the library service is enjoyed by its residents, as represented in the survey sample. Although some people from outside of the city are likely to use and value the library, this is unlikely to be extensive given the city’s demographics, especially as the use of the library’s online services appear to be modest. However, it should be recognized that additional benefit derived by visitors from outside of Wagga Wagga and interlibrary loan recipients and also by organizations, such as schools and busi-
nesses, is likely, nevertheless, to be significant. It might be noted, for instance, that the city library hosts around thirty school visits a year.

The 2006–7 budget for the library was $1,329,422. This figure is intended to cover ongoing library operations, including staff costs, acquisitions, subscriptions, IT hardware and software, and so forth. The budget does not cover accommodation costs, as the library is housed in the civic complex, which is maintained by the council as a whole. For the purposes of this estimation, it is assumed that respondents did not dwell on accommodation when they considered the library’s services and collections. Although 7 percent of the budget would have been derived from the state government, it was assumed that respondents would not have known or considered this additional income source when casting their vote. Thus, the total budget for the current year was taken to represent total cost at the present time.

As the total benefit for the present level of services was estimated to be $1.76 million, it appears that the library provides good value for the money, with a benefit-cost ratio of approximately 1.33 : 1. The ratio might be over 1.5 : 1 after benefits to organizations and visitors from outside of Wagga Wagga are taken into account.

Conclusions and Discussion

The CV survey indicated that the Wagga Wagga City Library is providing good value for the money. This does not necessarily mean that it should receive more funding: a change in the level of investment (in real terms) may affect the benefit-cost ratio, and it may well be that other council services also provide good value for the money. However, it may also be that certain other council expenditures do not benefit the community to the extent that the library does, and unless even better benefit-cost ratios are shown across the board, the council would not be justified in singling out the library for any budget cut. It is therefore worth it for the library to emphasize the survey’s findings in its budget application and also to cite them as part of its general promotional campaign. It is also worth the library noting that the estimates do not include secondary benefits (multipliers), which are likely to significantly add to the total benefit that the library provides its community.

It may be that the library could provide a similar level of service with less funding or a better service with the same level of funding, but the same could be said of any other service. CVM looks at benefit rather than cost and expenditure; other forms of evaluation are required to examine efficiency and internal effectiveness. Comparisons cannot be made against other possible budgets, as the outputs are unknown, nor can they be made against other possible services, for the same reason. Comparisons can only
be made with other existing services, operating with existing budgets. Even then, comparisons may not be fair if the “markets” are different, that is, the communities the services serve differ in economic and cultural terms. Services provided by the same council would generally not serve different communities, but a library in an inner metropolitan suburb may well serve a quite different set of people from that served by Wagga Wagga City Library. Even if the costs were similar, benefit levels may differ for reasons other than the quality of service. A population may have greater needs—lower literacy and information literacy levels, poorer access to information, and so forth—and it may have greater expectations; the equation is further complicated as needs and expectations may not correlate.

Nevertheless, it is interesting to compare the benefit-cost ratio for Wagga Wagga City Library with the estimates for public library systems in the United States and Norway that were also based on CV surveys. The St. Louis study used an open-ended WTP question and a no demand–revelation correction mechanism [24]; it is thus quite likely to be less conservative than the Wagga Wagga estimate. Yet its result is only a little higher, with the average benefit-cost ratio around 2 : 1. The Norwegian study claimed a considerably higher ratio of 4 : 1, but this was based more on responses to WTA than WTP questions [27]; the WTP results were again in line with those of the Wagga Wagga survey, producing a ratio a little over 1 : 1. Favoring the WTA results was justified in terms of the population’s perceived “inherent right” to public libraries, apparently likely to lead to understatement. However, the same could be argued in the Australian case.

Those public library valuations based on techniques other than stated preferences have produced considerably higher rates of return, but their use of more indirect data and a greater number of extrapolations makes their validity as estimations of actual demand subject to question. For instance, whether a circulated book is worth its purchase price minus a certain secondhand price is highly questionable: users are borrowing particular books gratis and may not wish to purchase these books for anything like the estimated value. It should also be noted that some valuations also take into account multipliers that CVM does not. It is necessary for any comparisons to be made on a level playing field, and on such a field, the Wagga Wagga City Library appears to serve its community well.

Using CVM to Valuate Library Services
On the face of it, CVM worked well in this particular study. A high response rate and low protest-response rate minimized sampling bias, and the statistics showed that voting patterns were associated with demographic characteristics, just as they tend to be in real life. The resulting benefit-cost ratio also seemed reasonable, given the respondents’ reported use of the library and their evaluations and comments. However, the design of the
survey raised a number of important issues that need to be borne in mind in future studies.

CVM asks respondents to respond to hypothetical situations in an honest way, something more likely to occur when the scenarios are realistic. This gives rise to the first concern: the difficulty, in some cases, of constructing realistic scenarios based on existing services. It is not always clear to respondents how they currently pay for a library service, and it may be even less clear why that method should be substituted for one in which they pay for the service directly. This applies to library services as a whole, as well as to particular services within a library, and it applies to other types of libraries, such as college libraries, as well as to public libraries. Nevertheless, with the help of careful explanation, respondents can be persuaded to imagine scenarios that may not be likely but are conceivable. The key is to pilot a particular scenario and to gauge respondents’ reactions.

A second issue is that of incentive incompatibility; respondents may behave as if the scenario were real but lie for tactical or strategic reasons. However, although it has been argued that even referendum-based CVM is not theoretically incentive compatible, allowing respondents to indicate reasons for their vote enables the researcher to weed out many of the false negatives, while a range of options can also encourage voters to consider more carefully why they might not accept a bid.

Third, there is another way in which honest responses may not reveal demand. A response might be ill-informed or overinformed. WTP questions can only be answered if the respondents know what is being offered, and so a brief overview of the particular service is described. However, such an overview might be new information for some respondents, rather than a clarification or a reminder of what they are voting on. This new information might affect the way respondents vote (perhaps they did not realize that the library offered free Internet access, for example, and now would be willing to pay more than they would otherwise have been). The trouble is that it cannot be anticipated how much particular respondents know or do not know. It may be argued that by presenting a description of the service, the resulting valuation represents not what the sample would be prepared to pay but what it would be prepared to pay after having read through the description; yet an informed choice might be a fairer condition given that a minor advertising campaign could have the same effect. On the other hand, CVM aims to estimate WTP, not what patrons “ought to pay,” even if the functionality of a service or the content of a collection may not be fully appreciated. It is up to librarians to educate patrons and potential patrons. The information given to respondents should not amount to a brochure and should be as neutral as possible. Librarians should do their campaigning before the CV survey.

Fourth, and finally, a response may be influenced by reference to the
current cost of an existing service; a respondent may be reluctant to pay more for a service than what he knows he is currently paying for it. In this way, CVM may work less well for existing services than for proposed ones. However, in this survey, the bid was indicated to represent the cost of maintaining the present level of service even if this did not correspond with the reality outside of the scenario. It is unlikely that many of the respondents would have known any better than to trust this indication (even the librarians would be hard-pressed to accurately estimate the library’s cost per ratepaying household).

The four key issues described above need to be investigated further, however, both generally and in relation specifically to library applications of CVM. More research is required to ascertain which particular types of WTP or WTA questions, coupled with which particular correction mechanisms, generate the most accurate models of demand and the extent to which information about a service affects responses. To this end, an examination of the credibility of various hypothetical payment scenarios in the context of public, academic, and other libraries would be of great benefit to future applications of SP techniques to library services, as would a comparison of valuations using the various demand-revelation correction mechanisms, including certainty scales, in the context of particular library user groups. Additionally, it is also worth checking the assumption that users do not have a very precise notion of how much they pay, indirectly, for a given library service. Investigations into both scenario credibility and payment notions, if not the correction mechanism comparison, could be carried out by means of relatively simple surveys. It would also be very interesting to examine the way in which the socioeconomic profile of a community might affect results, although this might be a more challenging project, given the other variables involved.

It is true that a limitation of SP techniques is that they gauge direct benefits more than indirect ones, such as multipliers, although they are able to cover passive use (i.e., their appreciation by nonusers) as well as active use. As Missingham points out, CVM and other SP techniques cannot cover latent benefits, that is, benefits derived by future populations [4]. On the other hand, this may not matter too much if the purpose of the investigation is to examine how a service benefits the current population against the current costs of that service; future generations are not paying for existing services. These benefits should, in fact, include future benefits based on current usage; respondents should consider how a library service’s current operations might benefit them in the future, both directly and indirectly. Whether or not respondents are aware of the extent to which present-day library services might impact their futures is another question, but it is one that applies to all goods and services, not just those delivered by libraries.
Although SP techniques such as CVM may be more suited to certain funding and use situations, there are many library services to which they could be profitably applied—many more than they have been applied to so far. Both CV and CM surveys require very careful question construction and thorough piloting; they also require large, broad-based samples and some relatively sophisticated statistical analysis. This means that in some cases librarians may prefer to outsource the survey design and analysis to expert consultants, but the surveys themselves should not require huge amounts of time or money. Furthermore, they produce results that are readily intelligible to executives. They may strengthen librarians’ claims for adequate funding, demonstrate the value of existing services to the communities they aim to serve, and provide concrete evidence of the potential benefit that new services would produce through relatively modest additional investment.

REFERENCES


