

An assessment of household willingness to pay for curbside recycling: A comparison of payment card and referendum approaches

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Abstract

Curbside recycling is a tool that communities use to reduce the need for landfill space. This study provides contingent valuation estimates of household willingness to pay (WTP) to continue a curbside recycling program in the face of budget cuts. Comparisons of two forms of the contingent valuation method (CVM) are provided: a single bounded referendum and a payment card. Neither approach emerges as unambiguously superior. Response rates were virtually identical. Both approaches show that support for curbside recycling is highly sensitive to price. Regression results from the payment card provided a more thorough identification of socio-demographic variables associated with WTP than the referendum, but the explanatory power of the two regressions did not differ significantly. The referendum estimates of mean WTP exceed those from the payment card, although the disparities are less than those typically reported in the CVM literature. Local policy makers cited the CVM results as influencing their decisions regarding funding options for the future of the program, and seemed to appreciate the fact that the two approaches provided a fairly narrow range of estimates of WTP. In an era when more of the burden of financing of environmental programs is being shifted to the local level, use of CVM to estimate the WTP of consumers for highly disaggregated goods and services designed to achieve environmental improvement will likely become more relevant to local decision makers who are interested in understanding their constituents' views.

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1. Introduction

As communities throughout the US continue to struggle with issues concerning solid waste disposal, recycling is becoming more attractive as an alternative to incineration or creating new landfills (Huhtala, 1999). While the costs of remanufacturing many materials continues to prohibit recycling's competitiveness from a strict market standpoint, the social costs of landfill expansion may mean that consumers would be willing to pay more money to recycle

than simply having their trash removed for permanent disposal in the ground (Tiller et al., 1997; Lake et al., 1996).

In previous years, federal and state funds have been available to communities that wish to participate in recycling programs. Recently however, federal and state agencies have been increasingly reluctant to assist in these programs without substantial financial support from the local level. In the absence of survey data, local public officials have little understanding of whether their constituents are willing to pay to continue recycling programs.

Over the past few decades, natural resource economists have made great gains in understanding public attitudes towards a variety of environmental initiatives. The Contingent Valuation Method (CVM) has emerged as a primary tool in this effort (Carson et al., 1994). Until recently, relatively little research had focused on consumer willingness to pay for recycling. Aadland and Caplan (2003a,b)

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produced a wide ranging CVM analysis of curbside recycling, and concluded that because of community differences, studies of this type would need to be done on a community by community basis. It is our contention that, given the gains economists have made in refining CVM procedures, this tool should be used to give local decision makers the information they need about funding recycling programs in an era of tight budgets.

The primary purpose of the study undertaken here was to estimate residents' willingness to pay (WTP) for curbside recycling in Lake County, OH. Lake County (population 228,000) is located next to Cuyahoga County (Cleveland)—a major metropolitan county of over 1.4 million residents. In many ways, Lake County is typical of American communities located at the rural–urban fringe. It is rapidly urbanizing in the portion adjacent to the metropolitan area, has a 'small town' atmosphere near the center, and is somewhat rural at the end furthest from the Cleveland area. The Lake County Solid Waste District (LCSWD) encompasses the entire County of Lake. A major component of the LCSWD effort to meet the state mandated 25% reduction in material going into landfills is the countywide curbside recycling program. Initially, the recycling program was paid by an additional fee charged to waste haulers using the LCSWD landfill. In spite of a 9-year history of countywide curbside recycling, a change in state law lowered the fees that solid waste districts could charge to pay for recycling. This fee reduction combined with a rapid increase in recycling costs threatened the continuation of the curbside recycling program (DiSanto, 2001).

In order to continue the program, the LCSWD was forced to consider levying a fee to make up for the shortfall. This fee would be either attached to the garbage bill of households or come out of the communities' general fund. In either case however, it would not be possible to target only participating households for payment because of constraints imposed by recycling vendors who cite economies of scale and prohibitively high costs of excluding non-payers as sufficient reasons to require an 'all or nothing' program. Also, while every household may not choose to participate in recycling, all households benefit from reducing the need to expand the LCSWD landfill and the resulting additional costs that would be imposed on each household. In other words, the curbside recycling program is a community good rendering this topic highly appropriate for CVM research.

A secondary purpose of this study was to determine to what extent the willingness to pay to maintain the program was dependent on the type of CVM vehicle used. The two most direct, simplest and least expensive formats for attempting CVM have been the payment card and the single-bounded or simple referendum (Kramer and Mercer, 1997; Brown et al., 1996). We wanted to determine to what extent WTP estimates are related to the type of instrument or vehicle used.

Finally, we wished to examine to what extent various attitudinal, behavioral, and demographic variables were associated with WTP, and again, whether these relationships were a function of the type of CVM vehicle we used.

2. Survey design and methods

Researchers and volunteers in Lake County mailed a total of 2000 surveys to randomly select resident voters of the county. The mail list was obtained from the County Board of Elections with the assistance of the Lake County Data Center staff. The surveys were divided into two sets of approximately 1000 each: one eliciting willingness to pay by a 'payment card', the other featuring only a simple referendum.

A modified Dillman (1978) procedure was utilized to conduct the survey. This procedure not only enabled us to achieve a higher response rate, but also allowed us to perform statistical tests to determine whether we had significant differences between early and late respondents. A total of three mailings were made. The initial mailing contained the survey and a cover letter asking the respondents to reply within 2 weeks. A reminder letter was sent 1 week after the first mailing. The first two waves of completed surveys numbered 1182 (considered early respondents). A final mailing with a copy of the survey was sent 2 weeks after the reminder notice, and produced an additional 276 responses (considered late). This brought the number of usable surveys to 1458 out of a total of 1984 actually delivered, for an overall response rate of 73%. Assuming that late respondents are more like non-responders than those who initially sent in completed surveys, we were able to conduct a variety of statistical tests to determine whether non-response bias was a problem in this study (Miller and Smith, 1983). More discussion of this can be found in the regression summaries presented later in this article. Response rates did not differ significantly by survey instrument (74.3% for the payment card and 72.7% for the referendum).

The survey included attitudinal, behavioral and demographic questions. The results of selected questions among this portion of the survey are presented in Table 1. These results indicate that the income, age and gender distribution of the sample reflects that of the voting population of the community as a whole. The participation rate of the respondents is somewhat high compared to curbside participation rates in other studies (Schultz et al., 1995; Vining and Ebreo, 1990), but is consistent with previous surveys and anecdotal evidence previously provided for Lake County residents.

In the payment card survey, each respondent was confronted with a series of money amounts ranging from \$1.00 to \$3.00 per month in 50-cent increments, and asked to circle their maximum WTP for the program (see Appendix A). These respondents were also given the option

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