

Language-Related Differences in Environmental Benefits

Estimation: Evidence from a Mail Survey*

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Abstract

The contingent valuation method (CVM) is firmly established as a very important tool to evaluate the economic value of environmental goods. CV is especially valuable as a way to study environmental values that have no close representations in the market place—for which methods that rely on weak complementarity with market goods are inadequate. The chief disadvantage of CVM is that it is hypothetical. The data elicitation process may influence the data that underlie value estimates. This process is made more complex by the need to communicate with populations that do not share facility in a common language. If a CVM survey instrument is prepared only in the language of the majority, it may distort the pattern of responses and induce systematic misinterpretation of survey questions. Both effects could introduce bias into the resulting estimates of willingness to pay. In the United States, there are many non-English-speakers, especially Spanish-speakers. Many either do not speak English fluently or are more proficient communicating in Spanish. Thus, in the U.S. context, potential differences surrounding the Hispanic community are of particular importance for survey-based research. There have been very few studies comparing CVM responses of English- and Spanish-speaking respondents and those that have done so used phone interviews as the elicitation methodology. Phone interviews are different from mail survey in many ways. Findings on effects of language differences obtained from phone interviews may not apply to mail surveys. Until now, unlike the case of phone surveys, English- and Spanish-speaking households' responses have not been carefully analyzed in the context of a mail survey.

This paper fills this gap in understanding stated preference methods by comparing

the responses from English- and Spanish-speaking households to a mail survey. Each household received both English and Spanish versions of the survey instrument. The survey also asked about language use in the household. Thus, there are two ways to test the effects of language on estimates of willingness to pay. The object of the valuation exercise was willingness to pay for residential properties near a harbor contaminated by toxic industrial wastes.. Using conjoint choice methods, the survey asked the recipients to make choices between hypothetical homes and their current home. Each home was represented by some key house attributes, which included lot size, house size, quality of schools, park and nature areas near the harbor, the environmental condition of the harbor area, and house price. Apart from the environmental condition, each variable was allowed to take on four hypothetical values that were calibrated in relation to the respondent's current home. The environmental condition also took on one of four levels: no change from the current condition; added pollution, partial cleanup, and full cleanup. The attribute levels were explained in the survey narrative.

We first compare the attitudes of English- and Spanish-speaking households towards house attributes by making use of attitudinal responses from the survey. Recipients were asked about the importance they place on specific house attributes. Using the responses for those questions, a non-parametric test detected statistically significant differences between the response frequencies for all attributes except lot size and price. The Spanish-speaking households appear to have stronger opinions than English-speaking households about all of the attributes in question as evidenced by the higher frequency of responses in the "Somewhat Important" and "Very Important" categories. Next, we estimated conditional logit models (CLM) to discern whether the language difference also affected responses to the conjoint choice experiment. There are two ways to separate the sample into language subsamples: One is based on the answers to the question in the survey that asked which language they speak in their households (household language); the other is based on the version of survey to which they responded (response language).

In analyzing the data, we first estimated pooled models for both household language and response language. Linguistic group is modeled as a dummy variable and interacted with all the house attributes except net income (annual household income net of the annualized house payment). The net income variable is interacted with income category (low, medium, or high). The pooled model results support language differences only with respect to school class size and harbor environmental condition,(except partial cleanup) when household language is used, and with respect to living area when response language is used. For both of the pooled models, the English-speaking households value the house attributes more than Spanish-speaking households, which is inconsistent with the comparison of attitudinal responses. An income effect may explain this contradiction. For pooled estimates, the coefficients are confound preferences with a scale parameter that may differentiate groups. We can test differences between the variances, thus the scale factor, of the two language group. If it exists, then without correction, estimates will be biased. One way to test the language effects that avoids the need for rescaling and normalization is to separate the

English- and Spanish-speaking observations, estimate the CLM separately, then test if the estimated coefficients vary between subsamples. A likelihood ratio test rejects the null hypothesis of equality of all the respective coefficients between the English- and Spanish-speaking subsamples. The rejection suggests that either the parameter (preferences) or the scale factors (variance) or both are different for the two language speaking groups. Rescaled pooled models are estimated to test the similarity of pure preference effects. A grid search technique is used to find the relative scale factors for the two subsamples. The results of the rescaled pooled models suggest that language usage does have an effect on house selection, especially with respect to school class size and no change in or full cleanup of the harbor environment.

After model estimation, we evaluate compensating variation as an indicator of households' willingness to pay for prospective changes in the harbor environmental condition. Generally, English-speaking households exhibit a higher mean WTP (or WTA compensation for additional pollution) for changes in environmental conditions. However, when response language is used, the mean WTP for an improvement of environmental conditions and mean WTA for added pollution are negative for Spanish-speaking households. Also, the results for this particular group are very sensitive to model specification. When the specification is modified slightly, the results change dramatically. The reason for the fragility might be due to cultural differences or effects of translation of the survey that increase the variation in interpretation.

For all the estimates, the 90% confidence intervals of the mean WTP/WTA for the English- and Spanish-speaking subsamples do not overlap, so the differences between the two subsamples regarding WTP/WTA are highly significant. All of the results indicate significant differences between English- and Spanish-speaking households. These findings strongly suggest that a mail survey addressing an environmental issue that may affect a linguistically diverse population should be designed at the outset with multiple languages in mind. The potential for translation to introduce variability poses econometric challenges in the analysis of responses. It is important to test for scale effects and to correct for them in order to obtain the pure parameter effects.