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METHODS

Contingent valuation: A new perspective

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ARTICLE INFO

Article history:
Received 6 October 2006
Received in revised form
3 October 2007
Accepted 3 October 2007
Available online 31 October 2007

Keywords:
Behavior
Field experiments
Hypothetical bias
Incentive compatibility
Information
Preference formation
Referendum
Stated preferences
Survey methodology
Validity
Voting behavior

ABSTRACT

After several decades of academic research on the contingent valuation (CV) method a consistent behavioral explanation of 'hypothetical bias' is still lacking. Based on evidence from economics, economic psychology and the political sciences, I propose an explanation that is based on two simple working hypotheses about respondent behavior in contingent valuation surveys. The first hypothesis is that survey respondents are unable to form consistent preferences about unfamiliar goods unless the choice context offers reliable, informative cues which can be rationally exploited in simplified heuristics. The second hypothesis is that the probability and impact of strategic responses in dichotomous-choice questions about public goods depends on the extent to which the presented hypothetical costs differ from the actual costs. The literature on hypothetical bias is revisited in the light of these behavioral hypotheses. I find that the hypotheses are generally supported by the empirical data. Moreover, the hypotheses are able to explain several important empirical phenomena that previous research has not been able to explain. In particular, they solve the puzzle that pre-election polls, but not CV surveys, are able to predict actual referendum outcomes, and they explain why income effects on willingness to pay are lower in CV responses than in actual votes. If confirmed by further studies, the hypotheses will have important implications for future research and practice. First, the hypothetical costs presented in the dichotomous-choice question should to be close enough to the actual costs to be credible to all respondents. This can be achieved by specifying the costs as a *percentage* (rather than absolute) change in taxes. Second, the respondents should be given the option to answer based on information about the positions of large parties and interest groups with known political orientation rather than based on the raw policy information. Theory and evidence suggest that this new survey paradigm largely eliminates the fundamental problems of the conventional stated preference methods.

1. Introduction

In an article on the economic analysis of social interactions, Manski (2000) states:

> "Economists have traditionally asserted that respondents in surveys about public goods have no incentive to answer questions about their preferences carefully or honestly. Hence, there is no reason to believe that subjective responses reliably reflect respondents' behavior in actual choice contexts. As a result, the profession has enforced something of a prohibition on the collection of subjective data".

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doi:10.1016/j.ecolecon.2007.10.010

Some forty years ago, early environmental economists decided to break with the self-imposed rule. Krutilla (1967) argued convincingly that there exist preferences for public goods which do not leave a behavioral trail. Hence, revealed preference techniques may not be sufficient to accurately measure societal values for public goods. The stated preference elicitation approach which became most established and most popular among environmental economists is known as 'contingent valuation'. In the dichotomous-choice variant of this approach, a proposed public good or policy is described to a sample of respondents that is representative of a relevant population. Typically, the specific good or policy in question has not been the subject of public debate before the survey. The respondents are then confronted with a hypothetical (randomly assigned) dollar price and asked if they would be willing to pay this amount if the proposed public good was actually provided. The blueprint for this survey design, according to the proponents of the method, is a popular vote in which citizens decide whether they should tax themselves to provide a specific public good at specified costs (see Mitchell and Carson, 1989; Arrow et al., 1993; Hanemann, 1994).

Landmark contributions to this literature are the proceedings of a workshop sponsored by the U.S. Environmental Protection Agency (Cummings et al., 1986) and a book by Mitchell and Carson (1989) which was quite favorably discussed in the Journal of Economic Literature (Bergstrom, 1990). In the environmental economics literature, the received scepticism resounding in the earlier "reference operating conditions" (Cummings et al., 1986, p. 104) gave way to a vague optimism and claims "that CV findings can be meaningful" (Mitchell and Carson, 1989, p. 171) and that "CV studies convey useful information" (Arrow et al., 1993, p. 4610). The Exxon Valdez oil spill in 1989 highlighted the potential relevance of the method for litigation and public policy and triggered the phase of intensive research on stated preference methods which continues to this day.

Naturally, the academic research on the contingent valuation method has been mainly interested in assessing survey 'validity', i.e., whether the responses in the hypothetical choice situations reflect the preferences observed in actual choice situations. Accordingly, the research focus has been on comparing hypothetical and actual choices in such settings where actual choices are observable, and any disparity between actual and hypothetical choice has been broadly referred to as "hypothetical bias". The proximate explanation of any rejection of the null hypothesis of "no disparity" has thus been the hypothetical or non-consequential nature of the decision. Ultimate explanations for observed hypothetical bias have been sought in the lack of various aspects of "survey quality" (e.g. Arrow et al., 1993), and particularly of incentive compatibility (e.g. Cummings et al., 1997). Regarding the latter, the hypothesis has been that bias may arise from strategic answering in other than one-shot dichotomous-choice questions or from a lack of motivation for serious answers if the probability of affecting the outcome is (nearly) zero (see e.g. Carson et al., 1999).

However, these previous explanations of "hypothetical bias" are unable to account for important empirical regularities. For instance, 'hypothetical bias' in one-shot dichotomous-choice questions has been found to be lower than in open-ended questions (McFadden, 1994) — and not higher as expected based on received assumptions about the incentive compatibility of one-shot dichotomous-choice questions (Arrow et al. 1993). Furthermore, as political scientists have long shown, pre-election polls consistently produce responses that are very close to the actual voting decisions despite their non-consequential nature.

Here, I propose an explanation of hypothetical bias in contingent valuation surveys that is based on two simple working hypotheses about respondent behavior, one related to the issue of incentives and one related to the issue of information provision and cognitive limitation.

The first working hypothesis is:

Hypothesis 1. Survey respondents are unable to form consistent preferences about unfamiliar goods from the raw product or policy information unless the choice context offers reliable, informative contextual cues that can be rationally exploited in simplified heuristics.

Such cues can for instance be product acceptance by other individuals with similar tastes, or credible information about the positions of parties with known ideological orientation. This hypothesis strongly contrasts to the standard perspective according to which isolated individuals know (or are able to construct) their preferences based on the raw policy information provided in stated preference surveys. As will be shown later on, this hypothesis receives overwhelming support from the voting literature in the political sciences.

The second working hypothesis, which concerns only choices about public goods and policies, is:

Hypothesis 2. The probability and impact (influence on sample estimates of willingness to pay) of a strategic answer by a respondent *i* depends on the extent to which the hypothetical costs presented in the dichotomous-choice question deviate from *i*'s actual costs if the policy is implemented.

Hence, the larger the difference between hypothetical and actual costs, the more likely will a "sophisticated" respondent perceive the hypothetical nature of the costs and hence his or her strategic opportunity, and the larger will be the effect of a strategic response on the survey results.

Together, these behavioral hypotheses imply testable predictions of hypothetical bias in stated preference surveys (Table 1). They imply that hypothetical bias in surveys about unfamiliar public goods will be lowest if reliable, informative cues are available and if the hypothetical costs presented in the survey correspond to the actual costs if the policy is implemented (lower-right cell in Table 1). Surveys following the

Table 1 – Predictions about hypothetical bias in preference surveys

Hypothesis 2	Hypothesis 1	
	No informative cues available	Informative cues available
Large disparity of presented and actual costs	Large bias	Medium bias
No disparity of presented and actual costs	Medium bias	Small bias