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Does gender matter when using cheap talk in contingent valuation studies?

Pierre-Alexandre Mahieu
University of Rouen, France

Abstract

Cheap talk is frequently used in contingent valuation surveys in an attempt to mitigate hypothetical bias. This paper aims at investigating in two case studies whether the effects of cheap talk on willingness-to-pay depend on the gender of the participants. Results of the two studies point in different directions. In one study, cheap talk influences both men's and women's willingness-to-pay while in the other one, it only influences women's willingness-to-pay. A possible explanation is discussed.

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1. Introduction

Overestimation of Willingness-To-Pay (WTP) typically occurs in contingent valuation studies (see Murphy *et al.*, 2005 for a meta-analysis). To mitigate hypothetical bias, Cheap Talk (CT) (Cummings and Taylor, 1999) is often used. Participants are explicitly warned about hypothetical bias and are asked to respond to the valuation question as if the payment were real. However, CT might have little or no effect on some people, like those refusing to read CT or those lacking experience with the good being valued. Results of a contingent valuation survey conducted by List (2001) illustrate the latter case. The author compares the responses of two groups of respondents, the experienced and inexperienced ones, and finds that CT is not effective for the group of experienced participants. Similar results are found by Lusk (2003).

Gender often matters in contingent valuation studies. For instance, men and women generally state different WTP (Farreras *et al.*, 2005). Likewise, gender may also matter when dealing with CT: the effectiveness of CT might depend on whether the respondent is a male or a female. This issue is relevant when deciding the instrument to be used. If CT has little or no effect on a category of respondents, say male, it might not be fully appropriate to use CT in a survey where most participants belong to this category. This paper aims at testing in two case studies whether CT has the same effect on both sexes. The remaining of the paper is organized as follows. Section 2 describes the two contingent valuation surveys. Section 3 explains the econometric model. Sections 4 presents the results. Section 5 provides concluding remarks.

2. Surveys

Two different contingent valuation surveys were conducted in Rouen, France, on fishes and elephants. The questionnaires, based on existing ones (Bateman *et al.*, 2005; Svedsater, 2007) are structured as follows. The first part includes questions on environmental issues. For example, in the survey on elephants, participants rate the importance they attach to the conservation of biodiversity on a scale ranging from 1 (“not important at all”) to 10 (“extremely important”). Then, a program is presented in each of the surveys; in one survey, the program consists of stabilizing the acidity in Pyrenean remote lakes mountain to prevent the death of fishes, and, in the other one, it consists of creating protected areas in Africa to save elephants.

After presentation of the program, half of the participants is faced with the CT script. The script is read aloud by the interviewer in the fishes survey, while it is to be read by the participants in the elephants survey. The script, identical in the two surveys, is as follows:

> Let me tell you about a problem encountered in similar surveys. People generally state higher amounts when the payment is not actual. Indeed, when we simply express an intention and that the answer does not have actual consequences like here, we tend to forget that our budget is limited and that the money spent for the program will not be available for other purchases. Please consider that the payment is real. For each of the amounts stated, ask yourself whether you would be really willing to pay it.

A Two-Way Payment Ladder (TWPL) with payment amounts ranging from 0.6 euro to 214 euro and a Multiple-Bounded Uncertainty Choice (MBUC) with amounts ranging from 2 euro to 400 euro are used in the surveys on fishes and elephants respectively. Both the TWPL and MBUC formats allow participants to express uncertainty. In TWPL, people are faced with a series of bid amounts, and state the maximum amount they would definitely pay, and the minimum amount they would definitely refuse to pay (Jones-Lee *et al.*, 1995). In MBUC, people are asked to pick a certainty level to pay each of the bid amounts (Welsh and Poe, 1998). When the certainty levels in MBUC include extreme levels, like here ("I am definitely sure that I would pay", "I am definitely sure that I would not pay"), both formats provide the same information – the maximum amount an individual would definitely pay and the minimum amount he would definitely refuse to pay. Furthermore, the mean WTP can be estimated similarly, as shown in the next section.

The surveys on fishes and elephants were conducted in 2008 and 2007 respectively. In the study on fishes, one-on-one interviews were conducted with a sample of the population living in Rouen, France, aged between 18 and 86. On the other hand, several group interviews were carried out at the University of Rouen with Science students at the beginning of the lectures for the survey dealing with elephants, with all the instructions being reported in the questionnaire.

3. Econometric model

In both surveys, the true WTP is assumed to lie between the highest payment accepted and the lowest amount refused, that is between the highest amount the individual would definitely pay and the lowest amount she would definitely refuse to pay. The econometric procedure, which follows Cameron (1988), corresponds to the so-called interval data regression (O'Garra and Mourato, 2007).

Let denote $i = 1,\ldots,N$ the index for each respondent in the sample, WTP_i the true willingness-to-pay, t_{li} the highest bid amount that the individual would definitely pay, t_{ui} the lowest bid amount she would definitely refuse to pay, x_i a vector of explanatory variables including the interaction variable $woman \times CT$, ε_i a random component following a normal distribution with mean zero and standard deviation σ. Then:

$$WTP_i = x_i'\beta + \varepsilon_i \qquad (1)$$

WTP_i is known to lie within the interval bounded by t_{li} and t_{ui}. The probability for WTP_i to fall within this area is

$$P(t_{li} < WTP_i < t_{ui}) = P\left(\frac{t_{li} - x_i'\beta}{\sigma} < z_i < \frac{t_{ui} - x_i'\beta}{\sigma}\right) = \varphi(z_{li}) - \varphi(z_{ui}),$$

where z_i is the standard normal random variable and, z_{li} and z_{ui} represents the lower and upper bound limits. The following log-likelihood function can be maximized for N independent observations, with β and σ being the unknown parameters:

$$\log L = \sum_{i=1}^{N} \log\left[\varphi(z_{ui}) - \varphi(z_{li})\right].$$

The mean WTP for the sample (unconditional mean) corresponds to the intercept in equation (1) after exclusion of the independent variables (for more details, see Cameron and Huppert, 1989; Cameron, 1988).

4. Results

Interval data regressions were computed using STATA 10.0 software. The results of the mean comparison are displayed in Table 1. It appears that CT has no influence on men's WTP in the surveys on elephants (p=0.494) while it influences both men's and women's WTP in the survey on fishes.

Estimation of equation (1) leads to the same conclusion, as shown in Table 2. In the survey dealing with elephants, the interaction variable *woman*×*CT* is significant at 5% significance level, unlike the variable *CT*. It is the reverse in the study related to fishes. The interaction variable is NOT significant at conventional level, unlike the variable *CT* (10% level).

Regarding the other explanatory variables included in equation (1), the variable *age* has a negative influence on WTP while the variable *income*, expressed in hundreds of euro, is positively related to WTP in the survey related to fishes. These variables are not significant in the elephants survey. As expected, people reporting a higher score on the biodiversity scale ranging from 1 ("not important at all") to 10 ("extremely important") state a higher WTP than the rest of the participants for the program dealing with elephants protection.

Table 1. Mean comparison using *t*-test

		No CT	CT	*p*-value
Fishes	Woman	22.50 (1.90) N=183	18.25 (1.55) N=175	0.042**
	Man	17.69 (2.26) N=132	12.62 (1.19) N=158	0.019**
Elephants	Woman	30.33 (3.69) N=57	16.53 (1.86) N=55	0.001***
	Man	17.76 (3.25) N=27	17.69 (2.94) N=25	0.494

Notes: Standard errors are in parentheses beneath mean. ***, **, and * indicate significant at 1%, 5% and 10% level, respectively, for one-tailed test; the null and alternative hypothesis are H_0: $\mu_{CT} \geq \mu_{NoCT}$; H_A: $\mu_{CT} < \mu_{NoCT}$

Table 2. Determinants of WTP

	Fishes	Elephants
Constant	20.45*** (3.62)	-27.16 (21.15)
Age	-0.24*** (0.06)	0.18 (0.98)
Income	0.44*** (0.14)	-1.08 (1.31)
Woman	6.40* (3.60)	9.35** (4.37)
Biodiversity	-	4.85*** (1.80)
CT	-4.76* (2.61)	2.58 (5.02)
CT×*Woman*	1.25 (3.97)	-11.44** (5.45)
Number of observations	623	157

***, **, * refer to statistically significant at 1%, 5% and 10% levels, respectively for two-tailed test. The dependant variable is WTP. Standard errors are in brackets. The question on biodiversity is not included in the survey on fishes.

5. Concluding remarks

A possible explanation is that men might not read the CT script with care, or not read it at all, unlike women. According to Meyers-Levy (1989), women are comprehensive information processors whereas men are much more selective when processing information. Women make an effort to assimilate all of the available information. On the other hand, men make their judgement on only a subset of the available information. Hence, CT might be effective at decreasing both men's and women's WTP when the CT script is read aloud by the interviewer, like in the study on fishes, while it might be effective for women only when the CT script is to be read by the participants, like in the study on elephants.

This hypothesis has been recently discussed by Ladenburg and Olsen (2009a) although the authors did not formally test it. The authors investigated in a single choice experiment whether CT influenced both sexes (Ladenburg and Olsen, 2009b) and found that male participants' stated choices were not affected by CT unlike women's ones. They state: "[...] following the selective hypothesis [see Meyers-Levy, 1989], the explanation might be simply that men have overlooked the OOR script [Opt-Out Reminder, i.e. CT] or at last have paid little attention to the content of the OOR […]. Unfortunately, the design set-up […] does not

make it possible to assess whether this is actually the case" (page 18). The results of our surveys give some support to this selective hypothesis.

It would be interesting to check in a fully controlled experiment whether similar results are obtained. In our study, the two surveys differ with respect to more that whether the CT is read aloud or not like the payment vehicle, the interview method and the good to be valued. Thus, a fully controlled experiment could be of help to isolate the effect of gender on the effectiveness of CT. Furthermore, the use of debriefing questions in such experiment could help to better understand why CT might be ineffective for male. Male may refuse to read CT or, alternatively, they may accept to read CT but find that its content is irrelevant.

In the case men's WTP are indeed insensitive to CT when the script is to be read by the participants, the use of CT might not be fully relevant in certain contexts, like when mail or internet surveys are used. If so, solutions are to be found, especially as men appears to be more inclined to overestimate their WTP than women as suggested by several studies (Brown and Taylor, 2000; Mitani and Flores, 2007). This could also represent further research.

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