



Hypothetical bias, cheap talk, and stated willingness to pay for health care

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ABSTRACT

Subjects with rheumatoid arthritis (RA) enrolled in an online panel were asked to evaluate pairs of treatment alternatives with different attributes. Half of the sample saw a cheap-talk text. Preference parameters were estimated using random-parameters logit models to account for unobserved taste heterogeneity. The models also were estimated in willingness-to-pay (WTP) space instead of conventional utility space. Cheap talk not only affected the coefficient on the cost attribute, but also preferences for other attributes. WTP estimates were generally lower in cheap talk sample, except for the most important attribute and a 2-level attribute. Subjects who were presented with cheap talk discriminated between the adjoining attribute levels better than the subjects in the control sample.

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1. Introduction

Revealed-preference (RP), behavioral data for eliciting willingness-to-pay (WTP) values for health-care interventions or treatment alternatives rarely are available. The lack of such data requires relying on stated-preference (SP) data. SP methods consist of contingent valuation (CV) (known also as willing to pay method) and stated-choice (SC) (known also as conjoint analysis or discrete-choice experiments) surveys. CV surveys typically focus on a single good and service using one or two open-ended or closed ended questions, whereas SC surveys focus on eliciting preferences for individual characteristics of a good and service using a series of trade-off questions. SP surveys elicit WTP via evaluations of hypothetical scenarios, where the cost of the program or treatment is one of attributes. Obtaining valid WTP estimates for health-care interventions requires that subjects accept offered costs as actual out-of-pocket costs. This requirement may be rejected or not taken seriously in a hypothetical setting. The fact that subjects in health applications often are covered by health insurance may exacerbate this problem.

The difference between hypothetical (stated) and actual (revealed) values is known as hypothetical bias. There is a large literature that compares hypothetical and actual values from contingent valuation studies. [Murphy et al. \(2005\)](#) provide a recent review of this literature. Most of these studies suggest that hypothetical values are higher than actual values ([Heberlein and Bishop 1986](#); [Cummings et al., 1995](#); [Fox et al. 1998](#)). More recently, several studies have investigated hypothetical bias in stated-choice studies. [Carlsson and Martinsson \(2001\)](#) evaluated SC tradeoffs by comparing hypothetical donations with actual donations for environmental projects. They found that preferences between a hypothetical and an actual scenario were not significantly different. They also found that hypothetical WTP was not significantly different from actual donations. In a health application, [Telser and Zweifel \(2007\)](#) found evidence of external validity of the SC method, where they compared hypothetical choices from a SC study with actual choices.

Another way to investigate hypothetical bias is to compare SP data results with results from RP methods ([Adamowicz et al., 1994](#)). [Mark and Swait \(2004\)](#) used both an SP survey and an RP survey to evaluate physicians' prescribing decisions in the only health application of this kind. They found that the marginal-utility estimates for the attributes are equal across the two methods, once error-variance differences have been accounted for.

Testing the validity of SP data using comparisons to RP or actual data is not possible for hypothetical or newly emerged markets, situations where RP variables are highly correlated, or when there is insufficient variation in variables of interest. "Cheap-talk"

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strategies have been proposed as a way of mitigating hypothetical bias in SP studies. The term “cheap talk” is used in game theory to describe nonbinding communication between players intended to influence the outcome of a game (Lusk, 2003). Cheap-talk was first investigated in a stated-preference study by Cummings and Taylor (1999). They inserted text into the survey that explained the problem of hypothetical bias and exhorted subjects to pay close attention to the actual opportunity costs of the hypothetical alternatives. In this context, cheap talk can be thought as communication that breaches the usual anonymity between survey researchers and respondents. The researcher attempts to engage subjects in the research problem and to motivate them to devote more effort, attention, and imagination to the preference-elicitation task that they otherwise would do.

This approach has been applied in several applications of environmental and non-market goods in CV surveys (List, 2001; Brown et al., 2003; Murphy et al., 2005; Blumenschein et al., 2008). The findings on the effect of the cheap talk has been mixed (Brown et al., 2003; List, 2001). While some studies suggest that cheap talk lowers WTP estimates (Cummings and Taylor, 1999; Ajzen et al 2004), some studies find no significant effect (Murphy et al., 2005; Aadland and Caplan, Blumenschein et al., 2008).

The purpose of this study was to analyze the effect of a split-sample, cheap-talk experiment on patients' preferences for rheumatoid arthritis (RA) treatments in an SC survey. To our knowledge, this study is the first application of cheap talk to an SC survey in a health application.

An on-line panel of subjects with RA were asked to evaluate pairs of treatment alternatives with different attributes in a web-enabled survey. Half of the sample saw a cheap-talk text. Preference parameters were estimated using random-parameters logit models to account for unobserved taste heterogeneity. The WTP values were calculated from models that were estimated in WTP space instead of conventional utility space.

2. Method

2.1. Stated-choice surveys

SC is a technique specifically designed to elicit individuals' willingness to accept tradeoffs among alternatives with multiple attributes. Analysts have used SC to quantify preferences for a variety of market and non-market goods and services. These goods and services include medical interventions, pharmaceutical treatments, and environmental health risks (Arana et al., 2008; Johnson et al., 2006a,b; Gan et al., 2004; Bryan et al., 1998; Johnson et al., 1998; Johnson and Desvousges, 1997; Ryan and Hughes, 1997). The basis for SC analyses is the hedonic principal that products are composed of a set of attributes and that the attractiveness of a product to an individual is a function of these attributes. SC recognizes that individuals place different levels of importance on a product's attributes and, thus, are willing to accept tradeoffs among them.

2.2. Cheap-talk strategy

In SC surveys, many subjects may be unaccustomed to evaluating out-of-pocket costs for health services as high as those presented in choice tradeoffs. However, there currently is little empirical evidence on how subjects evaluate health-care cost information in SC surveys. SC subjects may ignore costs altogether in evaluating tradeoffs, discount indicated costs because they are accustomed to paying only a fraction of actual costs, or recode cost levels to categories such as “low”, “medium”, and “high” (Johnson et al., 2008). Such decision heuristics result in measurement

error or bias because of differences between the cost levels used in estimation and the cost levels subjects used in their evaluations of trade-off tasks.

We used a cheap-talk strategy to overcome the limitations listed above. Half of the sample saw a cheap-talk text, which was also read to them using a sound clip, and the other half was used as a control sample. The cheap-talk text was aimed at focusing subjects' attention on the actual levels of the cost attribute. The text used in the survey was as follows:

Before you tell us which medicines you prefer in the following questions, we want to ask you to help us with a problem we have in studies like this one. Because people don't really have to pay the cost of the medicine they say they prefer, they often don't pay a lot of attention to the actual cost shown. It seems easier just to notice that one cost is larger than another cost.

For example, if the cost levels for the medicines in the questions are \$10, \$20, \$50 and \$100, people often think of them as just “very low”, “low”, “medium”, and “high”. They don't really think about what they would have to give up out of their monthly budget – such as a restaurant meal or some new clothes – if they actually bought the medicine. If people don't pay attention to the actual costs, our analysis will be wrong. We won't get a true measure of the value of RA medicines.

Please help us measure your preferences correctly by paying attention to the actual costs of the medicines before deciding which one of the two alternatives you prefer.

2.3. Survey development

The survey was developed in an iterative process using information from several sources, including published literature describing RA treatments (Thompson et al., 1984; Slothuus and Brooks, 2000; Gan et al., 2004; Jobanputra et al., 2004; Fautrel et al., 2005; Fraenkel et al., 2006) and consultations with medical and survey-research experts. The survey described six primary treatment attributes: (1) chance that the treatment will work, (2) onset of effect, (3) mode and frequency of medicine administration, (4) duration of injection-site reaction, (5) risk of treatment-related serious infection, and (6) out-of-pocket cost per month not covered by insurance.

Pre-testing of the SC survey was done with face-to-face interviews. The pretest subjects were recruited through the local newspapers in the Triangle area in North Carolina, USA. The interviews were conducted with a total of 10 (7 female and 3 male) RA patients between the ages of 30 and 65 years. The two main issues explored during pre-testing were (1) the subjects' ability to understand and accept the treatment attributes and levels presented to them in the questionnaire and (2) their willingness to trade off treatment features in their selections between pairs of treatment profiles. The pretests also were used to test the length and wording of the survey instrument.

During the interviews, each participant was asked to complete a paper-and-pencil version of the draft survey instrument. As they answered the items in the survey instrument, they were encouraged to “think aloud,” describing their thoughts as they went along. In addition, the interviewer used directed probes to further elucidate the responses.

The pretests helped us to identify the levels of the attributes, especially the lower and upper bounds of the cost attribute. Overall, the participants found the survey instrument easy to understand, and the trade-off questions contained levels that induced participants to consider their decisions carefully. The attributes and

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