



ACCURACY'S IMPACT ON RESEARCH

A Knowledge Networks Newsletter



Stated Preference Methodology: Innovative Online Approaches to Accurate Measurement

By J. Michael Dennis

The Stated Preference (SP) methodology and especially its sibling, Contingent Valuation (CV) methodology, continue to evolve as critical U.S. public policy tools, especially in the areas of the environment and health. As defined by Richard T. Carson, Contingent Valuation is a survey-based method frequently used for estimating monetary values on environmental goods and services not bought and sold in the marketplace.^[1] CV is a specific tool for estimating the public's willingness to pay for non-market goods and services such as food safety, wildlife preservation, and clean air, beaches, and water. SP is a broader survey-based approach that includes CV, conjoint,

discrete choice, and other methods. With the risks and costs imposed by global warming, industrialization, and other trends affecting the environment, SP and, in particular, CV findings are likely to find their way into the policy formation literature with accelerating speed.

Knowledge Networks (KN) is proud to work with investigators in this area, to provide accurate findings and help bridge the gap between abstract concepts and policy implementation. This article highlights some of the SP studies in which Knowledge Networks has partnered, and some of the ways that investigators have leveraged our resources to add reliability to their valuations.



The Survey Instrument

Investigators continue to raise the standard of the Stated Preference literature by employing carefully considered, logic-based approaches, including discrete choice. An example of this is an EPA-funded study by George Van Houtven of Research Triangle Institute—Eliciting Risk Tradeoffs for Valuing Fatal Cancer Risks.^[2] Often, health benefits in practical applications are valued using one common measure of VSL (Value of Statistical Life), and the data are based entirely on immediate and/or accidental death. In contrast, Dr. Van Houtven and his co-authors Chris Dockins and Melonie Sullivan from EPA's National Center for Environmental Economics, sought to understand how citizens value cancer risk, including its potential latency aspect, as compared to other risk types. In Dr. Van

Houtven's web-based survey conducted by Knowledge Networks, the survey asks respondents to choose between residences—one that offers lower automobile fatality, and one with lower cancer risks.

Table 1 provides a clear, unambiguous visual depiction from the survey, useful in eliciting respondent choice. In the results of this study, the main implication of findings was that—particularly for shorter cancer latency periods—standard VSL estimates may understate the benefits of policies that reduce fatal cancer risks. An earlier study by DeShazo and Fermo suggests that the simplicity of this choice exercise likely strengthens the validity of the survey approach.^[3]

Table 1: Example Choice Task in the Risk Tradeoff Survey

The table below summarizes the *only* differences between Location A and Location B.

	Location A	Location B
Car Accident Deaths (Per Year)	50 Per Million People	100 Per Million People
Fatal Stomach Cancers (Caused Per Year)	100 Per Million People	50 Per Million People

If you had to move to one of these locations, which one would you prefer?

Location A <input checked="" type="checkbox"/>	Location B <input type="checkbox"/>
No Preference Between Location A and Location B <input type="checkbox"/>	

The ease of Knowledge Networks online survey administration also helped Resources for the Future (RFF) to establish clear economic estimates of benefits resulting from potential improvements to lakes in NY State's Adirondack Park. EPA funded investigators from RFF to conduct a five-year study to determine willingness-to-pay (WTF) for air pollution reductions in terms of total use and non-use value.^[4] As a quality test, Banzhaf, Burtraw, Evans, and Krupnick designed a survey administered to a random sample of NY State residents using both the online KnowledgePanel[®]—the only probability-based online Panel representative of the U.S. population^[5]—and a mail survey conducted by KN, the results of which point to consistency across the two survey modes. The investigators also used attitudinal and demographic details collected from KN Panel members to estimate sample-selection models against several groups, e.g., refusers and those who dropped off KnowledgePanel[®]. The investigators could administer several versions of the survey with efficiency via KnowledgePanel[®]. Most prominent, one survey featured a base case with a constant baseline, which included small government-funded improvements; another version included a gradually worsening baseline paired with larger government-funded improvements (scope case). Surveys also featured several different tax-and-spending trade-off scenarios, ranging from the subject at

hand—improving the health of lakes—to infant health care.

Findings from this study were consistent with previous research;^[6] in addition, they offered useful and realistic willingness-to-pay ranges across NY State households. This study remains a useful guide for U.S. policymakers in addressing the effects of acid rain on all of North America.

Reducing Respondent Burden and Reaching the Respondent Target

To get a precise understanding of the trade-off that Americans might make between moving to an area with better water quality, versus one with a lower cost of living, the EPA funded Professors Joel Huber from Duke University's Fuqua School of Business and W. Kip Viscusi of the Harvard Law School (now at Vanderbilt University) to examine this issue. Huber and Viscusi commissioned Knowledge Networks to conduct a general population survey on KnowledgePanel[®] to determine the value that individuals place on clean lakes and rivers in the United States. The study's CV methodology examined the payment levels that individuals would be willing to make for improved quality, calling on respondents to comprehend and remember large amounts of information while making difficult choices among alternatives that have several simultaneously varying features (e.g., cost and pollution differences across alternatives).

To meet this challenge, Knowledge Networks used color graphics to reduce respondents' burden by making the choice process less cognitively taxing. For each choice screen, a respondent chose among three alternatives, with each alternative and its associated features arranged vertically within a matrix. The survey effectively used color and layout to organize the labels and features, making it easy for respondents to choose their most preferred alternative. In addition, the choice process was assisted by a design innovation—for each successive choice in a given series, features from previous screens were displayed. Graphics capabilities permitted new choice features to appear on the screen, while information from previous screens was displayed in muted text. This study had a within-survey completion rate of 81%, and the survey data were delivered 23 days after the survey was fielded. These data are part of the input to a willingness-to-pay contingent valuation model developed by Professors Viscusi and Huber.

Based on the premise that VSL is proportional to remaining life expectancy, some economists assume that older people and those with chronic illness are willing to pay less than healthier individuals to reduce their risk of dying. However, Alberini et al conducted a pair of studies in 2002 for Resources for the Future^[7]—one of which was implemented via KnowledgePanel[®]—to which respondents could answer online survey questions in the privacy of their homes, enabling less healthy and/or physically challenged respondents to participate. A side-by-side comparison of aging populations (age 60

and above) was made in the U.S. and Canada to derive the value placed on reducing one's risk of death. The study's findings reveal that Canadians who are 70+ years old show a decline of about 30% in willingness to pay, but Americans showed no decline; in fact, those with cancer or chronic heart or lung disease are willing to pay more.

Other Stated Preference and specifically Contingent Valuation studies conducted by Knowledge Networks have contributed to the literature on innovations in questionnaire design and WTP estimation, and have provided public input on non-use values of various environmental goods.^{[8] [9] [10]} While the large number of SP studies would appear to indicate that the methodology has matured, SP is still very much an evolving methodology and one for which there are significant methodological concerns, including sources of potential error and bias, the cognitive aspects of survey questions, and overall reliability of results. All SP studies can contribute to the literature as the method continues to innovate in design and approach. Knowledge Networks looks forward to working with investigators to meet their sample challenges, administer the most challenging survey sets, and find new applications.

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Dr. Dennis has managed numerous surveys for academic and Foundation-based customers and for the Research Triangle Institute. A frequent presenter at the annual meeting of the American Association for Public Opinion Research, his current areas of methodological inquiry are nonresponse bias, panel conditioning, and data collection mode effects. He can be reached at mdennis@knowledgenetworks.com or 650.289.2160.

Footnotes:

- [1] Carson, Richard T. 1999. "Contingent Valuation: A User's Guide." Univ. of California, San Diego, Dept. of Economics Discussion Paper 99-26.
- [2] Van Houtven, George, Melonie B. Sullivan, Chris Dockins. 2006. Cancer Premiums and Latency Effects: A Risk Trade-off Approach for Valuing Reductions in Fatal Cancer Risks. Presented at the April 2006 U.S. EPA NCER/NCEE workshop Morbidity and Mortality: How do we value the risk of illness and death?
- [3] DeShazo, J.R., and German Fermo. 2002. "Designing Choice Sets for Stated Preference Methods: The Effects of Complexity on Choice Consistency," *Journal of Environmental Economics and Management* 44(1): 123-143.
- [4] Banzhaf, Spencer, Dallas Burtraw, David Evans, and Alan Krupnick. 2004. "Valuation of Natural Resource Improvements in the Adirondacks." Working paper published by Resources for the Future.
- [5] KnowledgePanel[®] reaches the nearly 30% of respondents who do not have access to e-mail on a regular basis by providing them with an internet device.
- [6] Johnson, F. Reed, Richard W. Dunford, William H. Desvousges, and Melissa Ruby Banzhaf. 2001. The Role of Knowledge in Assessing Nonuse Damages: A Case Study of the Lower Passaic River. *Growth and Change* 32: 43-68.
- [7] Alberini, Anna, Maureen Cropper, Alan Krupnick, and Nathalie B. Simon. 2002. "Does the Value of a Statistical Life Vary with Age and Health Status? Evidence from the United States and Canada." Working paper published by Resources for the Future.
- [8] Cameron, T. A. and J. R. DeShazo. 2004. Valuing Health Risk Reductions: Sick-years, Lost Lifeyears, and Latency. University of Oregon. Eugene, OR.
- [9] DeShazo, J. R. and T. A. Cameron. 2004. The Effect of Health Status on Willingness to Pay for Morbidity and Mortality Risk Reductions. University of Oregon. Eugene, OR.
- [10] Smith, Anne E., Michael A. Kemp, Timothy H. Savage, and Catherine L. Taylor. 2005. Methods and Results from a New Survey of Values for Eastern Regional Haze Improvements. *Journal of the Air & Waste Management Association* 55: 1767-1779.