Strategies for Overcoming Hypothetical Bias in Stated Preference Surveys

John Loomis
Dept. of Agricultural & Resource Economics, Colorado State University
Outline of presentation

1. Defining Hypothetical Bias
2. Empirical Evidence of Magnitude
3. Ex-Ante Methods to Reduce Bias
4. Ex-Post Methods to Correct Bias
5. Conclusion & Future Research
Hypothetical Bias

Defining Hypothetical Bias

- Difference between stated WTP & a valid measure of actual WTP
Hypothetical Bias

Defining Hypothetical Bias

- Difference between stated WTP & a valid measure of actual WTP

Frequent Topic of Study

- 1st empirical study 1972
- 384,000 results in Google

No widely accepted theory of hyp bias

- Several competing theories:
  - Uncertainty of preferences,
  - Lack of consequentiality,
  - Only a problem at high bid amounts
Stated Preference Methods

SP methods

• Use what people state they would pay as a measure of their WTP
Stated Preference Methods

- SP methods
  - There are 3 types of Stated Preference Methods
Stated Preference (SP) Methods

- Controversial Valuation Method

CVM
Stated Preference (SP) Methods

CVM
- Contingent Valuation Method

Conjoint
- Rating Scale of choice (1-10)
- Used in marketing of new products
Stated Preference (SP) Methods

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Choice Experiments
- Discrete Choices
- (select one, ranking, least-most preferred)
Magnitude of Hypothetical Bias

– Hypothetical Bias found in the:
  • Lab (usually Cash)
  • Field (Cash donations)

– Meta Analysis
  • List & Gallet; Murphy, et al; Little et al (2012)
  • 60% of studies find hypothetical bias
  • Median bias 1.35; Mean bias =3

– Several SP studies do not show hypothetical bias, but most do → our focus today
If there is Hyp Bias, Why Do SP Studies?

CBA, EIS’s & Planning are Ex Ante

- We want to know what the value of different **Potential** actions are **before** we choose among the Alternatives
- So no actual behavior to use
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Public Goods & Non Use Value

- Public Goods: no markets
- Non Use Value: no actual behavior to observe

Marketing: Some Goods or Attributes do not exist yet

Producers want to know IF consumers would buy & their WTP
Strategies to Overcome Bias

Ex-Ante: Actions we can take in the survey design before they state their WTP

Ex-Post: Actions we take after they state their WTP to calibrate their WTP Responses to Actual
Ex-ante Methods via Survey Design

Cheap Talk:
• Tell respondents about hypothetical bias & not to do it
Ex-ante Methods via Survey Design

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- Tell respondents about hypothetical bias & not to do it

Consequentiality:
- Emphasize real world consequences of response to decisions about provision of good & taxes that will be paid
Ex-ante Methods via Survey Design

Cheap Talk:
- Tell respondents about hypothetical bias & not to do it

Consequentiality:
- Emphasize real world consequences of response

Oath
- Swear to tell the truth
Ex-ante Methods via Survey Design

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Inferred Valuation
- Ask what you think others would pay for the good
% of Estimates Using Ex Ante methods that Reduced or Eliminated Hypothetical Bias

- Consequentiality (n=5)
- Cheap Talk (n=12)
- Oath (n=3)

- Green: Eliminates
- Yellow: Reduces
- Red: Overcorrects
- Black: No effect
Ex-Post Methods to Calibrate WTP
Calibration done in other disciplines (engineering, hydrology)

1. Uncertainty Scaling
Uncertainty Scaling:
Question Asked after WTP response

- How certain are you that you would actually pay the $ amount:
  (circle one #)

 Validity studies suggest recoding Yes Votes with certainty less than 8 or 9 to NO Votes results in Hyp WTP matching actual cash donations.
Uncertainty Scaling: Question Asked after WTP response

- How certain are you that you would actually pay the $ amount:
  (circle one #)

Very Uncertain 1 2 3 4 5 6 7 8 9 10 Very Certain

Validity studies suggest recoding Yes Votes with certainty less than 8 or 9 to NO Votes results in Hyp WTP matching actual cash donations.

W/out with actual donation data to calibrate on, Champ suggests presenting a range of WTP estimates with different calibration factors.
% of Estimates Using Uncertainty Recoding: that Reduced or Eliminated Hyp Bias
Ex-Post Methods

• Uncertainty Scaling-Calibration

• Orbit Model
  – Combination of Ordered Probit & Tobit Model
    • Partition data into weighted anchor points
      – (e.g. WTP=0; Median WTP; treat higher $’s as ordinal)
  – Allows calibration factor to vary by the magnitude of WTP (e.g., higher calibration for high WTP amounts)
Ex-Post Methods

- Meta Analysis Equation Methodology
  Specific Calibration factors
  - Using Existing Meta Analysis where Dependent Variable is Calibration Factor
  - Explanatory Variables:
    - Methodological Variables affecting Calibration
      - Private vs Public Good
      - Dichotomous Choice vs Open Ended
      - WTP vs WTA
  - My example uses List & Gallet Meta Equation
Differing Calibration Factors for WTP Private vs Public Good by Elicitation Method

Differing Calibration Factors for WTP
Private vs Public Good by Elicitation Method
Differing Calibration Factors for Private vs Public Good, Elicitation Method & WTP vs WTA

![Bar chart showing WTP and WTA calibration factors for private and public goods.

- WTP DC Private Good
- WTP OE Private Good
- WTP DC Public Good
- WTP OE Public Good
- WTA DC Private Good
- WTA OE Private Good
- WTA DC Public Good
- WTA OE Public Good]
Conclusions

• Hypothetical Bias exists in most (but not all) SP surveys
• Hyp Bias can be avoided or reduced:
  – Ex Ante-survey design methods
  – Ex-Post-calibration of WTP responses
Future Research

1. Replication of Lusk & Norwood Inferred Valuation in Lab & field experiments
2. Replication of oath in Lab & in field experiments
3. Moving Consequentiality out of lab & into more field experiments
Future Research

4. Applying Orbit model to Open-ended and Payment Card CVM

5. Applying Meta Calibration Factors when new Meta Analyses appear
Thank You

• Questions?