Comparing Hypothetical Bias Mitigation Techniques: A Case of On-campus Battery Recycling

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Hypothetical Bias (HB)

- The difference in human behavior, usually welfare estimates such as Willingness to Pay (WTP), that is a result of hypothetical elicitation methods versus real cases where actual money and goods/services are exchanged.
- Multiple meta-analyses show that Hypothetical Bias is a consistent problem (List & Gallet, 2001; Murphy et al., 2005; Penn & Hu, forthcoming)

Minimizing HB

- Ex Post Methods: correcting responses after-the-fact
  - Certainty Follow-Up
  - Consequentiality

- Ex Ante Methods: altering the decision-process beforehand
  - Honest Priming
  - Opt-Out Reminders
  - Consequentiality
  - Oath
  - Cheap Talk

Research Goal

- Investigate the extent of Hypothetical Bias in the context of battery recycling.
- Examine the efficacy of ex ante HB mitigation methods: 1) Cheap Talk and 2) Ex Ante Consequentiality
- Examine the efficacy of ex post HB mitigation methods: 1) Certainty Follow-up and 2) Ex Post Consequentiality

Elicitation

- Hypothetical: “If you had the opportunity, would you be willing to donate $X of your participation incentive to support processing for battery recycling?”
- Real: “Would you like to donate $X of your participation incentive to support processing for battery recycling?”
- X=$1, $2, or $3

Data Collection Methods

- Four focus groups and small pilot
- In-person field survey
- Split-sample design
- Fielded in April and May 2017
- Each respondent initially provided a $5 participation incentive
- Screened for protest, inattentive, and incomplete responses

Ex Ante- Consequentiality

- **Important**: Please note that University of Kentucky recycling is aware of this study and anticipates using its results to serve as a guide for decisions in future campus initiatives. It is important that you carefully consider your answer.

Ex Ante- Cheap Talk

- In the past, students in surveys have tended to **overstate** how much they say they would donate compared to students in a real donation who use their own money. Even though your choice is hypothetical, please imagine that you're making a real donation from your own money.

Ex Post- Certainty Follow-Up

How certain are you of your choice to donate $X?

- Not Sure
- Probably Sure
- Definitely Sure

Ex Post- Consequentiality

How likely do you think that the results of this survey will shape the direction of future UK battery recycling initiatives?

- Very likely
- Somewhat likely
- Somewhat unlikely
- Very unlikely
- I don't know

Sample Composition

	Real	Hypothetical	Cheap Talk	Ex Ante Conseq
Characteristic	N=240	N=199	N=209	N=203
Freshman	33.8%	37.2%	28.7%	38.9%
Sophomore	26.3	16.6	19.6	15.8
Junior	13.3	18.6	22.0	17.2
Senior	12.9	17.1	17.2	17.2
Graduate Student	12.9	9.6	9.1	8.9
female	46.6	48.7	45.6	55.9
Enviro/Sustainability Class	26.6	30.8	30.8	28.6
Live on campus	47.5	52.8	47.4	54.2

Percent Yes

	Real	Hypothetical	Cheap Talk	Ex Ante Conseq
Amount	N=240	N=199	N=209	N=203
$1	32.0%	66.7%	55.6%	52.2%
$2	32.6	40.6	55.4	45.5
$3	19.0	46.0	49.4	57.1

Certainty Follow-Up Responses

	Real	Hypothetical	Cheap Talk	Ex Ante Conseq
Response	**N=240**	**N=199**	**N=209**	**N=203**
NA	100%	0	0	0
Not Sure	0	48.2%	46.9%	48.3%
Probably Sure	0	6.5	6.7	5.9
Definitely Sure	0	26.1	25.4	33.5

Percent Yes-Certainty Calibrated

		Real	Hypothetical	Cheap Talk	Ex Ante Conseq
Amount	Sample	240	199	209	203
$1	Old	32.0%	66.7%	55.6%	52.2%
	Calibrated		**59.7**	**52.4**	**47.8**
$2	Old	32.6	40.6	55.4	45.5
	Calibrated		**35.9**	**46.2**	**42.4**
$3	Old	19.0	46.0	49.4	57.1
	Calibrated		**38.1**	**42.0**	**47.1**

Ex Post Consequential Responses

Percentage	Real	Hypothetical	Cheap Talk	Ex Ante Conseq
	N=240	N=199	N=209	N=203
Don't Know	9.6%	7.0%	6.2%	8.4%
Very Unlikely	5.8	6.0	11.5	4.4
Somewhat Unlikely	16.7	19.6	17.7	17.2
Somewhat Likely	61.7	56.8	55.0	59.6
Very Likely	6.3	10.6	9.6	10.3

Consequential Only Yeses

		Real	Hypothetical	Cheap Talk	Ex Ante Conseq
	All	N=240	N=199	N=209	N=203
Amount	Conseq	N=163	N=134	N=135	N=142
$1	All	32.0%	66.7%	55.6%	52.2%
	Conseq	40.0	73.5	70.0	57.8
$2	All	32.6	40.6	55.4	45.5
	Conseq	34.8	47.5	62.5	51.1
$3	All	19.0	46.0	49.4	57.1
	Conseq	22.4	46.7	54.5	68.0

Econometric Approach

Turnbull Lower bound

$$E_{LB}(WTP) = \sum_{j=0}^{*Max+1} t_j \cdot f_j^{Y*} : f_j^{Y*} = F_j^{Y*} - F_{j-1}^{Y*}$$

Probit

$$Prob[Donating_i = 1] = \boldsymbol{x}_i'\boldsymbol{\beta} + \varepsilon_i$$