AN EXPERIMENT ON VALUATION QUESTION FORMAT:

IS THERE REALLY A DIFFERENCE BETWEEN "CHOICE EXPERIMENTS" AND "CONTINGENT VALUATION"?

Wiktor Adamowicz, Patrick Lloyd-Smith and Ewa Zawojska

University of Alberta, Canada

University of Warsaw, Poland

ezawojsk@utk.edu

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- help determine public's preferences
- provide estimates of economic value
- inform about the benefits for cost-benefit analysis
- are based on surveys
- use various formats

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Respondents vote on a proposed change at a specified cost.

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Would you be willing to pay $5 per year for the proposed program of building new hiking and bike trails?

Yes / No

Which program would you prefer?

	Program A	Program B
New hiking trails	None	100 km
New bike trails	None	250 km
Cost per year	$0	$5

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CV and CE are often described as differing in many aspects:

- the number of choice alternatives → only two in CV, any (sensible) number in CE
- the number of choice situations → typically one in CV, several in CE
- the use of attributes → no in CV, yes in CE
- information display → text in CV, table in CE

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- Both typically-named "CV" and "CE" are **discrete choice methods**.
- The only real difference is information display.

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Our research question:

- **Is there really a difference between "CV" and "CE"?**
  (in terms of elicited preferences)
- Does information display affect respondents' behavior in surveys?

Why is it important to study?

- Stated preference methods are of considerable research and policy interest (e.g. natural resource damage assessment). (Bishop et al. 2017)
- Can they provide valid and reliable estimates to inform decision making?
- Many studies tested convergence of estimates from "CV" and "CE".
  (e.g., Hanley et al. 1998; Cameron et al. 2002; Ryan 2004; Jin et al. 2006; Goldberg and Rosen 2007)
  - Evidence is mixed.
  - The comparisons are often not apples to apples (differ in the number of attributes, alternatives, choice tasks, in econometric methods, etc.)
  - The studies did not isolate the effect of information display.

Research design

- A lab experiment in Z-tree
- July 2017 at the University of Alberta, Canada
- Based on the study of Jacquemet et al. (2016)

Research design

Jacquemet et al. (2016) – **Table treatment**

Characteristic	Token A	Token B
Colour	Yellow	Blue
Size	Large	Medium
Shape	Triangle	Square
Cost	3.00	4.00

Which token would you like to buy?

- ○ Token A
- ○ Token B
- ○ Neither Token

Research design

Text treatment

Two Tokens are available, Token A and Token B. The colour of Token A is yellow, its size is large, and the shape of Token A is triangle. Token A costs 3.00. The colour of Token B is blue, its size is medium, and the shape of Token B is square. Token B costs 4.00.

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Size	Small	$0.50
	Medium	$2.50
	Large	$4.00
Colour	Red	$1.00
	Yellow	$1.50
	Blue	$2.00
Shape	Circle	$1.50
	Triangle	$3.00
	Square	$6.00

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- 9 choice tasks
- Earnings: 10 CAD + balance from a randomly selected choice task (0 – 9.50 CAD)
- Average earning: 16.04 CAD / 30 min; 12 sessions; 58 participants in Table, 57 in Text

Research question:

Does information display affect respondents' behavior in stated preference surveys?

	Table	**Text**
Correct responses	87%	87%
Average time per task	36 sec	48 sec

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Verification:
Can we replicate the results of Jacquemet et al. (2016)?

Table: proportion (in %) of correct choices by treatment

Exp. 1 *Baseline*	Exp. 2 *Calc.*	Exp. 3 *Paid*	Exp. 4 *Paid+Calc.*	Exp. 5 *Truth*	Exp. 6 *Task*	Exp. 7 *Office*
56.3	61.6	59.9	64.9	78.3	63.7	61.6

Probability of a correct response

A random effects logit model

Dependent variable – A response: 1 – correct, 0 – incorrect

	Coefficient (St. Error)	
Text	-0.131 (0.358)	← No influence of the information display
Responded in up to 20 sec	-1.134*** (0.342)	← Lower chance of a correct choice for quicker responders
Round	0.115*** (0.043)	← Learning / Experience
Absolute difference in the tokens' value	0.256*** (0.049)	← Easier to make a correct choice when tokens differ more in value
Morning session	-0.617* (0.356)	← Tough mornings
Constant	1.548*** (0.404)	

Note: *** - 1% significance, ** - 5%, * - 10%.

Log-likelihood (constants only) -359.2

Log-likelihood -335.5

Probability of a correct response in the first round

A logit model

Dependent variable – A response: 1 – correct, 0 – incorrect

	Coefficient (St. Error)
Text	-1.322** (0.557)
Responded in up to 20 sec	-2.135*** (0.802)
Absolute difference in tokens' value	0.215* (0.111)
Constant	1.456*** (0.559)

← Lower chance of a correct choice in Text

Log-likelihood (constants only) -57.1

Log-likelihood -49.8

Quicker responses in Table

	Table	Table	Text	Text
Responded in up to 20 sec	**Yes**	**No**	**Yes**	**No**
Share of participants	21%	79%	5%	95%
Correct responses	71%	91%	67%	89%

More rushed responses in Table

	Table	Table	Text	Text
Calculated monetary values	**Yes**	**No**	**Yes**	**No**
Share of participants	83%	17%	75%	25%
Correct responses	91%	64%	90%	78%
Average time per response	40 sec	19 sec	48 sec	49 sec

← Similar.

← Even if they did not calculate, they devoted substantial time to figure out the correct response, and succeeded in that.

↑ When they did not calculate, they rushed through questions.

- Is it easier to oversimplify the task in Table?
- Hoehn et al. (2010) claim that tabular descriptions can sometimes oversimplify the scenario.

Response time

A random effects linear model

	Means (St. Error)	Interactions with Text (St. Error)
Round	-5.317*** (1.477)	4.795** (2.086)
Round squared	0.553*** (0.127)	-0.490*** (0.181)
Calculated monetary value	26.149*** (6.601)	-15.324* (8.835)
*Round*Calculated monetary value*	-1.091 (0.749)	-1.237 (1.001)
Absolute difference in tokens' value	-1.305*** (0.304)	-0.044 (0.432)
No time pressure (longest response time in a session)	0.143*** (0.032)	0.052 (0.046)
Constant	21.609** (7.723)	16.954 (10.597)

Log-likelihood (constants only) -4,597.0

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- A non-linear effect of *Round* – response time decreases to about the 5th round and then starts to increase.
- Calculating monetary values considerably increases response time.
- Shorter response time for a larger difference in tokens' value.
- Longer response time when others answer slowly.

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- Response time in Text differs because of differences in the influence of *Round* and *Calculated monetary value*.
- The effect of *Round* on response time in Text is negligible (statistically insignificant).
- Calculating monetary value increases response time in both treatments, however, the effect is by far weaker in Text.

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- The effect of *Round* is significant in Text only for those who calculated monetary value – response time shortens over rounds.

Findings

1) Information display does not affect the ability to provide a correct response.

- Except for the first round in which Text results in a significantly smaller probability of a correct response than Table.

2) Information display affects response time.

- Quicker responses in Table.
- More rushed (quick and incorrect) responses in Table.
- In Text, response time decreases over rounds.
  In Table, the effect is non-linear – response time decreases until about the 5th round, is constant for a while and starts to increase.
- In Text, the effect of a round is significant only for those who always calculated monetary value.

Conclusions

Is there really a difference between "CV" and "CE"?

- No, in terms of preference disclosure (except for the first choice task)

- Yes, in terms of response time

“whatsoever things are true”

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