Preferences for Alligator Hide Crafting Kits: A Test of Simul Methods of Hypothetical Bias Mitigation

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Introduction

- Stated preference valuation (SP) is widely utilized.
  - SP surveys often present hypothetical scenarios.
- A major challenge to eliciting values using SP
  - Hypothetical bias (HB): difference between economic value in hypothetical and real elicitations.
- Numerous methods have been employed to address HB, generally divided into ex-ante and ex-post approaches.
  - Ex-ante: Employed before the elicitation (cheap talk, oaths, and honesty priming)
  - Ex-post: Employed after the elicitation (certainty follow up questions, consequentiality)
  - Problem: Additional questions or time and limited effectiveness

Objectives

1. Define Simul methods; how they are similar to and different from ex-ante and ex-post methods.
2. Investigate Simul method effectiveness to mitigate HB via a change in Willingness to Pay (WTP) in a hypothetical and real discrete choice experiment (DCE) of craft kits.

Data Collection & DCE design

- Data collection: October 2023 - March 2024.
- DCE of preferences for craft kits embedded within an internet (Qualtrics) survey using a panel of US adults.
  - Each choice set features three kits and opt-out option.
  - Elicit preferences based on 8 attributes.
  - Efficient blocked design: 36 choice sets (6 blocks x 6 choice sets), randomly assigned to 1 of 6 blocks.

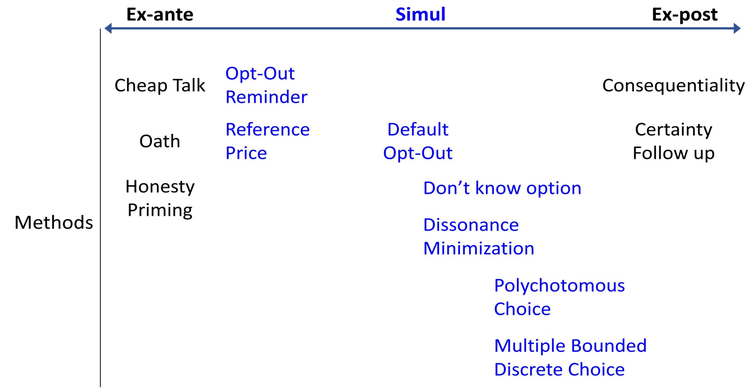
Kit Attribute (# of levels)	Description	Levels
Material (2)	The leather material of the kit	Cowhide, Alligator hide
Sourcing (2)[1]	The alligator's origin in Louisiana or not	Louisiana, US
Production method(2)[1]	The alligator's farming or wild origins	Farm-raised, Wild-caught
Scale Size (2)[1]	The size of the alligator scale	Small, Large
Scars (3)[1]	The size of the alligator scar	None, Small, Large
Item (3)	The type of item featured in the kit	Earring, Luggage tag, Keychain
Skill level (2)	The level of difficulty to assemble kit	Beginner, Intermediate
Price (4)	The price of the kit	$8, $16, $24, $32

[1]Alligator hide specific attribute

	Cow hide item	1st Gator hide item	2nd Gator hide item
Appearance of finished item		 Large scale	 Small scale with small scar
Sourcing	US	Louisiana Wild-caught	US Farm-raised
Skill Level	Intermediate	Beginner	Beginner
Price	**$24**	**$32**	**$8**

Experimental Design & Hypotheses

- Several Simul methods have existed for some time (e.g. Don't know), others are more recent (e.g., default choice, and opt-out reminder), this class of HB method has not been recognized.
- Simul methods may either be similar to Ex-ante or Ex-post HB mitigation methods.



- Respondents randomly assigned to 1 of 6 treatments, 2-5 test Simul methods:
  1) Hypothetical: Complete DCE without any Simul intervention
  2) Default opt-out: Making the opt-out option the default option (Penn and Hu, 2021)
  3) Opt-out reminder: Including a repeated statement in each choice set; "If you're uncertain or wouldn't pay for any of the three kits shown, you should select "I wouldn't buy any of these" (Alemu and Olsen, 2018)
  4) Reference price: Displaying a self-reported product price by respondents on each choice set; "Remember you spent $- the last time you were at a store" (Lim and Hu, 2023)
  5) Don't know option: Adding an extra option; "I don't know which I'd buy" (Arrow, et al., 1993)
  6) Real: One choice set randomly selected as real, must pay for and purchase item.
- Balanced treatments: There are no significant differences in demographic characteristics, except for age.

Treatment	Simul method	Payment	n
Control	-	Hypothetical	160
Simul 1	Default opt-out	Hypothetical	165
Simul 2	Opt-out reminder	Hypothetical	163
Simul 3	Reference price	Hypothetical	157
Simul 4	Don't know option	Hypothetical	159
Real	-	Real binding	211

Whether Simul methods reduce the opt-in rate and WTP for craft kit

$$H1_0: \text{WTP}_{Control} \leq \text{WTP}_{Simul}$$

Whether excludability information mitigates HB, measured by:

Calibration Factor (CF) = $\left|\frac{\text{WTP}_{\text{Hypo.}} - WTP_{Real}}{\text{WTP}_{\text{Real}}}\right|$

$$H2_0: CF_{\text{Control}} \leq CF_{Simul}$$

Basic Results

Opting in to purchase kits (%)	Control	Default opt-out	Opt-out reminder	Reference price	Don't know option	Real
Treatment	88.1	**82.4** (<0.001)	90.6	87.9	91.1	**36.3** (<0.001)
Total			88.0			**36.2** (<0.001)

Based on the difference of proportions t-test, the opt-in rate is significantly lower compared to the control or hypothetical group.

Mixed Logit Model Results

N= 1015	Main Effects	SD	Default opt-out	Opt-out reminder	Reference price	Don't know option[1]	Real
Price	-0.038***		-0.030***	-0.012	0.008	-0.010	-0.032***
Cow	1.238***	1.594***	0.281	0.860**	0.137	0.653*	-2.698***
Alligator	1.738***	1.626***	-0.776**	0.440	0.026	0.205	-2.920***
Beginner	0.077	0.848***	-0.064	0.151	-0.120	0.240	-0.320
Keychain	0.643***	0.963***	0.015	-0.225	-0.407*	-0.187	-0.344
Luggage	0.385**	1.226***	0.237	-0.013	-0.231	0.183	-0.081
Alligator*Wild	-0.113	0.551***	0.107	0.055	-0.023	0.115	-0.008
Alligator*Louisiana	0.292*	0.928***	-0.423*	-0.273	-0.147	-0.369	-0.497*
Alligator*Smallscar	-0.297**	0.485***	0.152	0.353*	0.135	0.273	0.291
Alligator*Largescar	-0.523**	0.517*	0.709**	0.321	0.136	0.681**	0.537
Alligator*Largescale	-0.163	0.425***	0.546***	0.017	0.208	0.036	0.011
H_0: Cow=Alligator	≤ 0.05		≤ 0.001	0.190	0.728	0.164	0.557

LL: -4809.4 AIC: 9770.7

[1] 14 (1.5%) choice sets were recoded from 'Don't know' to 'opt-out'.

Optout, intermediate, earring, farm-caught, US, none-scar, and small scale are the omitted reference group. *, ** and *** significant at p ≤ 0.1, 0.05 and 0.01 respectively.

Willingness to Pay

WTP from mixed model[1]	Control	Default opt-out	Opt-out reminder	Reference price	Don't know	Real
Cowhide	32.7***C	22.5***B	42.1***	46.0***	39.9***	-20.9***A
Alligator hide	45.9***C	14.2***B	43.7***	59.0***	41.0***	-16.9***A
WTP space						
Cowhide	29.0***C	16.8***B	46.8***D	38.9***D	40.9***D	-44.7***A
Alligator hide	30.7***C	13.0***B	47.5***D	34.1***	44.9***D	-28.0***A
CF[2]: $\left\|\frac{\text{WTP}_{\text{Hypo.}} - WTP_{Real}}{\text{WTP}_{\text{Real}}}\right\|$						
Cowhide	2.6	2.1	3.0	3.2	2.9	
Alligator hide	3.7B	1.8A	3.6	4.5	3.4	

[1]WTP and significance are calculated by delta method. [2]HB is calculated by using mixed model result. Testing equality of WTP and HB, the letter (D) indicates that value is significantly greater than (C), which is greater than (B), which is greater than (A).
*, ** and *** indicate a p-value ≤ 0.1, 0.05 and 0.01, respectively.

Conclusions

- Simul methods neither precede nor follow the elicitation process, working to affect behavior during the elicitation.
  - Potential time savings, both for the researcher and respondent
- Among the Simul treatments, only default opt-out affects preferences, increasing price sensitivity and decreasing preference for alligator hide kits.
- From WTP and CF, default opt-out addresses HB, decreasing the magnitude of WTP and HB – other Simul methods do not work.

References

- Alemu and Olsen. 2018. "Can a Repeated Opt-Out Reminder mitigate hypothetical bias in discrete choice experiments?" European Review of Agricultural Economics.
- Arrow et al. "Report of the NOAA panel on contingent valuation." Federal register 58.
- Lim and Hu. 2023. "Contextual reference price in choice experiments." American Journal of Agricultural Economics 105.
- Penn and Hu. 2021. "Mitigating hypothetical bias by defaulting to opt-out in an online choice." Applied Economics 53.

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