Exploring the Attitude-Behavior Relationship in Hypothetical and Non-Hypothetical Experiments: Willingness to Pay for Neonic-Free Plants

Xuan Wei
Mid-Florida Research and Education Center &
Food and Resource Economics Department, University of Florida
wei.xuan@ufl.edu

Hayk Khachatryan
Mid-Florida Research and Education Center &
Food and Resource Economics Department, University of Florida
hayk@ufl.edu

Alicia Rihn
Department of Agricultural & Resource Economics, University of Tennessee
arihn@Tennessee.edu

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Xuan Wei[1], Hayk Khachatryan[1], and Alicia Rihn[2]

[1]Food and Resource Economics Department, University of Florida

[2] Department of Agricultural & Resource Economics, University of Tennessee

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Introduction

In this study, we used both hypothetical online discrete choice experiments (DCE) and non-hypothetical laboratory experimental second-price auctions (SPA) to analyze consumers' willingness to pay (WTP) for ornamental plants grown with or without controversial (neonicotinoid) pesticides. We tested the comparability of the two samples and confirmed that WTP estimates differ across different elicitation mechanisms. We further investigated the extent to which consumers' attitudes toward pollinators health and conservation, neonicotinoid labeling, and relevant regulations influence their preferences by exploring the differences in WTP between various attitude-based dichotomous consumer groups.

Measurements of Attitudes

	Online DCE	SPA
	Mean (Std. Dev.)	Mean (Std. Dev.)
Attitude toward neonicotinoid pesticides and pollinators[a]		
I am concerned about the effects of neonicotinoid pesticides on pollinators.	5.48 (1.45)	4.89** (1.52)
We may face a pollination crisis where crop yields decrease because of fewer pollinator insects.	5.73 (1.43)	5.69 (1.41)
Pollination is vitally important to terrestrial ecosystems and to crop production.	6.39 (1.15)	6.26 (1.05)
I would be willing to accept an increase in my annual taxes of $100 next year to promote neonicotinoid-free production.	3.98 (2.02)	3.83 (1.81)
Mean	**5.37 (1.06)**	**5.19 (1.11)**
Cronbach's α	**0.66**	**0.79**
Attitude toward labelling neonicotinoids[a]		
The federal government should require mandatory labelling of plants that are treated with neonicotinoid pesticides.	5.86 (1.46)	5.85 (1.42)
Neonicotinoid labelling should be mandatory, because consumers have a right to be informed.	6.11 (1.24)	5.97 (1.31)
Mean	**5.99 (1.26)**	**5.93 (1.30)**
Cronbach's α	**0.84**	**0.92**
Attitude toward the importance of production method disclosed on a label[b]		
Pesticide free	5.70 (1.67)	5.84 (1.41)
Neonicotinoid free	4.97 (1.60)	5.42** (1.55)
Non-GMO/GMO free	4.83 (1.79)	4.79 (1.78)
Certified Organic	4.87 (1.75)	5.30 (1.51)
Organically produced	4.89 (1.69)	5.22 (1.54)
Mean	**5.05 (1.41)**	**5.30 (1.30)**
Cronbach's α	**0.89**	**0.90**

[a] Participants indicated their level of agreement with the statements using a 7-point Likert scale where 1=strongly disagree and 7=strongly agree.

[b] Participants indicated the level of importance of the information disclosed on the label using a 7-point Likert scale where 1=very unimportant and 7=very important.

Study Design and Experiment Overview

In-Person laboratory auction experiment

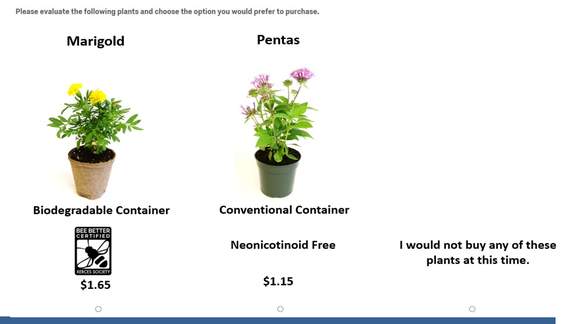
- Central Florida participants
- N=75
- Incentivized SPA
- Bid on 24 ornamental plants
- The auction winner (i.e., bidder with the highest price) pay the second-highest price and receive the random selected winning product.
- Survey questions
  - -Demographic information
  - -Knowledge about neonicotinoids and pollinator attractive plants

Online discrete choice experiment

- Participants recruited nationwide
- N=420
- View 16 choice scenarios
- Make hypothetical purchase decision for each scenario
- Select from one of three options: plant A, plant B, or an opt-out option
- Survey questions
  - -Demographic information
  - -Knowledge about neonicotinoids and pollinator attractive plants

Example of SPA item

Example of online DCE choice set



WTP Estimates

	Online DCE		SPA	
	WTP (Mean)	SE	WTP (Mean)	SE
Attitude toward pollinator: Agree Group				
Neonicotinoid-free text label	6.815***	0.781	0.516***	0.122
Neonicotinoid-free logo	12.271***	1.291	0.837***	0.136
Neonicotinoid-treated text label	-0.815*	0.389	-0.075	0.128
Attitude toward pollinator: Disagree Group				
Neonicotinoid -free label	1.351***	0.246	-0.091	0.092
Neonicotinoid -free logo	3.721***	0.336	0.051	0.099
Neonicotinoid -treated text label	-1.009***	0.225	-0.135	0.100
Attitude toward neonicotinoid regulation: Agree Group				
Neonicotinoid -free label	5.224***	0.541	0.512***	0.115
Neonicotinoid -free logo	8.512***	0.799	0.740***	0.128
Neonicotinoid -treated text label	-1.650***	0.427	0.101	0.120
Attitude toward neonicotinoid regulation: Disagree Group				
Neonicotinoid -free label	0.894***	0.237	-0.177*	0.089
Neonicotinoid -free logo	3.049***	0.341	0.094	0.097
Neonicotinoid -treated text label	-0.511*	0.239	-0.095	0.098
Overall PEB attitude: PEB Group				
Neonicotinoid -free label	9.657***	1.494	0.750***	0.205
Neonicotinoid -free logo	11.532***	1.731	1.150***	0.226
Neonicotinoid -treated text label	-0.952	0.547	-0.067	0.218
Overall PEB attitude: Non-PEB Group				
Neonicotinoid -free label	2.003***	0.245	0.053	0.074
Neonicotinoid -free logo	5.048***	0.375	0.233**	0.081
Neonicotinoid -treated text label	-1.209***	0.242	-0.115	0.080

*$p<0.05$. **< 0.01. ***< 0.001.

Results & Conclusions

- On average, participants with positive attitudes toward pollinator conservation, neonicotinoid labeling regulations, and labeling content, as well as stronger overall pro-environmental behaviors are willing to pay higher price premiums for plants with labels indicating the absence of neonicotinoids relative to their counterparts.
- Both hypothetical and non-hypothetical experiments are consistent in predicting the general direction of consumer preferences despite differences in the elicitation mechanism.
- Consistent with existing evidence, we also show that WTP estimates differ significantly across DCEs and SPAs, with DCEs resulting in much higher premiums. Our results suggest that differences in WTP estimates could mainly be driven by the hypothetical setting of the experiments in addition to the differences between experimental methods (DCE vs. SPA).
- Nonetheless, it is also possible that subjects in SPA may deviate from their true preferences and bid lower even though SPA is incentivized.
- The existence of a positive relationship between attitudes and individual-level pro-environmental behaviors is confirmed.
- We showed comparability between the local and national samples. Representativeness of a small sample can be improved through careful participant screening and recruitment.

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For additional information, please contact Hayk Khachatryan at hayk@ufl.edu.