

Eliciting Consequentiality in Stated Preference Surveys: An Application to Urban Green

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1. Introduction

Information on respondents' perceptions about survey consequentiality is typically collected close to the end of the survey, following the preference elicitation. We inquire whether—and if so, how—the location and a repetition of a consequentiality perception elicitation question matter for stated consequentiality perceptions and for stated preferences. To that end, we use data from a discrete choice experiment survey conducted in Germany, in which respondents evaluated a project of expanding urban green areas.

3. Discrete Choice Experiment

Survey questionnaire

1. Explanation of attributes



2. Discrete choice experiment

	Option 1	Option 2	Current state
Street trees	5 trees per 100 meters of a street	9 trees per 100 meters of a street	5 trees per 100 meters of a street
Green areas	25% of the city area is green spaces	20% of the city area is green spaces	20% of the city area is green spaces
Near-natural green areas	30% of the green areas is near-natural	40% of the green areas is near-natural	20% of the green areas is near-natural
Pedestrian and cycling greenways	60% of the ways are greenways	50% of the ways are greenways	40% of the ways are greenways
Cost for you per year	€300	€100	No cost
Which option do you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Follow-up questions

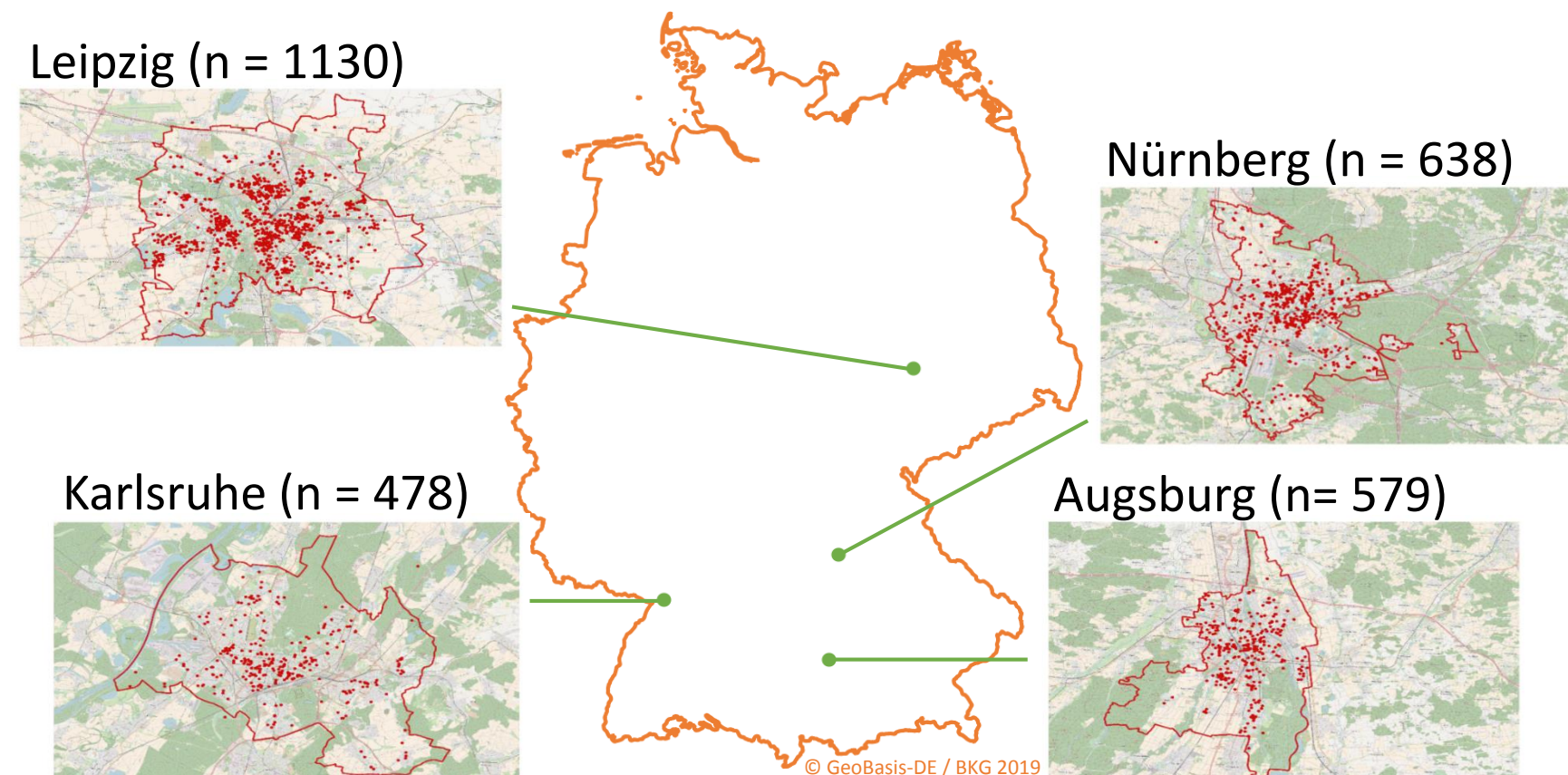


4. Behavior, attitudes, socio-demographic characteristics



Survey Implementation

- Computer-Assisted Web Interviews (CAWI)
- July – November 2018



2. Literature: Consequentiality in stated preference

- Literature defines conditions for truthful preference disclosure in stated preference surveys (Carson and Groves 2007; Carson et al. 2014; Vossler et al. 2012; Vossler and Holladay 2018)
- One of the conditions: The survey is consequential.

"Consequentiality describes a condition in which an individual faces or perceives a non-zero probability that their responses will influence decisions related to the outcome in question and they will be required to pay for that outcome if it is implemented." (Contemporary Guidance for Stated Preference Studies, Johnston et al. 2017)

- How are consequentiality perceptions elicited in stated preference surveys?
 - Usually a single question. Or two questions for policy and payment consequentiality (Zawojska, Bartczak and Czajkowski (2019))
 - Response scale: typically a Likert scale, from two to several levels
 - Location: after preference elicitation

=> Our research question: How does location and repetition of the consequentiality elicitation impact stated consequentiality perceptions and stated preferences?

4. Consequentiality elicitation in our survey

Two samples, each half of respondents:

- „Asked-Once“ sample: Respondents answer the consequentiality elicitation question once, right after preference elicitation.
- „Asked-Twice“ sample: Respondents answer the same consequentiality elicitation question twice, before and after preference elicitation.

We used following consequentiality elicitation question (translated from German):

To what degree do you believe that your responses will be taken into account by policy-makers and administration?

definitely considered	rather considered	rather not considered	definitely not considered	I do not know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1) How is stated consequentiality affected by the way (location & repetition) the perceptions are elicited?

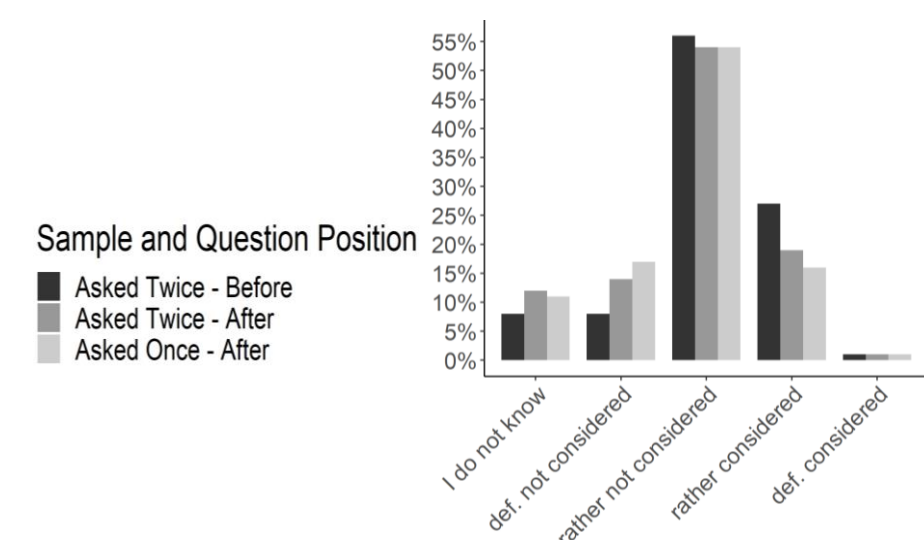
- Ordered logit model
- Dependent variable: stated perceived consequentiality (1=strong, 4=weak)
- Explanatory variables:
 - Binary variable for location of elicitation question („Before“)
 - Binary variable for sample that answers two questions („Asked-Twice“)
 - Controls for socio-demographic characteristics and recruitment method

5. Econometric Approach

2) Do stated preferences or the effect of consequentiality perceptions on stated preferences differ depending on the way the perceptions are elicited?

- Mixed logit models in willingness-to-pay space
- For differences in stated preferences: looking at mean preference parameters
- For differences in effect of consequentiality perceptions on stated preferences: looking at interactions of mean preference parameters and stated consequentiality → 3 models with the 3 different stated consequentiality responses interacted

6. Results



Dependent variable	Model 1 Responses to both consequentiality questions	Model 2 Responses to the consequentiality question asked as first	Model 3 Responses to the consequentiality question asked after preference elicitation
Sample	Asked-Twice	All	All
Before	-0.246*** (0.049)		
Asked-Twice		-0.764*** (0.082)	-0.493*** (0.081)
Male	0.055 (0.104)	-0.029 (0.080)	0.080 (0.081)
Age	0.003 (0.003)	0.002 (0.003)	0.003 (0.003)
Secondary or elementary	-0.061 (0.406)	0.141 (0.262)	0.126 (0.270)
High-school	-0.382 (0.403)	-0.061 (0.259)	-0.163 (0.268)
University	-0.442 (0.398)	-0.270 (0.258)	-0.228 (0.267)
Augsburg Online	0.084 (0.178)	0.016 (0.142)	0.128 (0.143)
Augsburg Postal	-0.515*** (0.196)	-0.526*** (0.160)	-0.496*** (0.160)
Karlsruhe Online	-0.101 (0.190)	-0.285*** (0.141)	-0.222 (0.144)
Karlsruhe Postal	-0.550*** (0.219)	-0.568*** (0.196)	-0.677*** (0.196)
Leipzig	0.178 (0.133)	0.129 (0.105)	0.106 (0.106)
Number of observations	2,514	2,600	2,580

Location & repetition: When asked twice, stated consequentiality is stronger in first question

Location: Stated consequentiality is stronger when asked before than after choice tasks

Repetition: Stated consequentiality is stronger after choice tasks for those who were asked twice

(only results from Leipzig)

3 mixed logit models in WTP space:

	Model I Asked-Twice	Model II Asked-Twice	Model III Asked-Once
Means interacted with	Before	After	After
Means			
Status quo (1)	-0.11 (0.03)***	-0.01 (0.03)	-0.30 (0.03)***
Street trees (1)	0.07 (0.01)***	0.07 (0.01)***	0.04 (0.01)***
Green areas (1)	1.79 (0.29)***	1.58 (0.27)***	0.58 (0.23)***
Near-natural green (1)	0.84 (0.14)***	0.81 (0.12)***	0.86 (0.10)***
Greenways (1)	1.27 (0.11)***	1.19 (0.12)***	0.76 (0.10)***
A negative of Cost (1)	1.57 (0.15)***	1.43 (0.10)***	1.58 (0.12)***
Standard Deviations			
Status quo (2)	1.62 (0.06)***	1.63 (0.05)***	1.57 (0.04)***
Street trees (2)	0.09 (0.003)***	0.11 (0.01)***	0.07 (0.00)***
Green areas (2)	2.46 (0.51)***	2.38 (0.26)***	1.38 (0.23)***
Near-natural green (2)	1.38 (0.19)***	1.45 (0.13)***	1.40 (0.11)***
Greenways (2)	0.74 (0.16)***	0.71 (0.10)***	0.40 (0.09)***
A negative of Cost (2)	1.46 (0.17)***	1.35 (0.11)***	1.55 (0.13)***
Interactions with perceived consequentiality			
Status quo (3)	0.20 (0.02)***	0.08 (0.03)***	0.21 (0.03)***
Street trees (3)	0.00 (0.01)	-0.01 (0.01)	0.00 (0.01)
Green areas (3)	-0.13 (0.20)	-0.78 (0.28)***	0.34 (0.21)***
Near-natural green (3)	-0.08 (0.12)	-0.27 (0.13)***	0.24 (0.12)***
Greenways (3)	-0.16 (0.10)	0.09 (0.12)	-0.08 (0.10)
A negative of Cost (3)	0.10 (0.09)	0.11 (0.08)	0.02 (0.09)

- Perceived consequentiality mainly shifts respondents' preferences regarding Status quo:
- When perceived consequentiality gets stronger, respondents are willing to pay more to avoid the current state

z-test on differences in mean preference parameters and interactions:

	Within-sample test: Does location matter?		Does repetition matter?	
	H ₀ : Model I – Model II = 0	H ₀ : Model I – Model III = 0	H ₀ : Model II – Model III = 0	
	Means	Interactions (perc. cons.)	Means	Interactions (perc. cons.)
Status quo	-0.095 **	0.119 ***	0.196 ***	-0.015
Street trees	0.002	0.012	0.026 ***	-0.002
Green areas	0.206	0.647 *	1.201 ***	-0.473 *
Near-natural green	0.031	0.188	-0.018	-0.322 *
Greenways	0.084	-0.244	0.510 ***	-0.081

Notes: The numbers inform on values of the differences between respective coefficients. The differences were calculated as indicated in the first row of the table.

Difference between using answers to the 1. or 2. question in the Asked-Twice sample:

- No significant differences in means expected (same respondents)
- Little significant differences in interactions

Effect of location of questions:

- Higher mean WTP of respondents who faced the question before choice tasks
- Little difference in interactions

Effect of repetition of questions:

- Some significant differences in the impact of perceived consequentiality on WTP (interactions):
- Using responses to the 1. question, WTP decreases with stronger consequentiality perceptions
- Using responses to the 2. (repeated) question, WTP increases with stronger consequentiality perceptions

7. Conclusions

- Findings are the same for three other cities Augsburg, Karlsruhe, Nürnberg
- The way how consequentiality perceptions are elicited (here: location and repetition) seems to matter for stated consequentiality.

- Also stated preferences seem to be sensitive to the way of elicitation. => Caution in designing the consequentiality elicitation
- WTP values increasingly corrected by consequentiality perceptions. These corrections might be sensitive to the way of elicitation.

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