

Heterogeneity of Recreational Services and Varying Preferences of Users

an Application of Choice Experiment
to French Forests

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Presentation structure

- Context
- The Choice Experiment Method
 - Theoretical background
 - The case of « irrational » individual preferences
- Protocol and questionnaire design
- Results
- Conclusion and future prospects

Problematic

- In France. recreation is mainly provided by public forests
 - ➔ Survey on demand is a basic information
- Quality and characteristics are essentials part of recreation
- Recreation is a non market service
- Users' preferences are not homogeneously defined



The use of Choice Experiment for economic assessment

Theoretical background

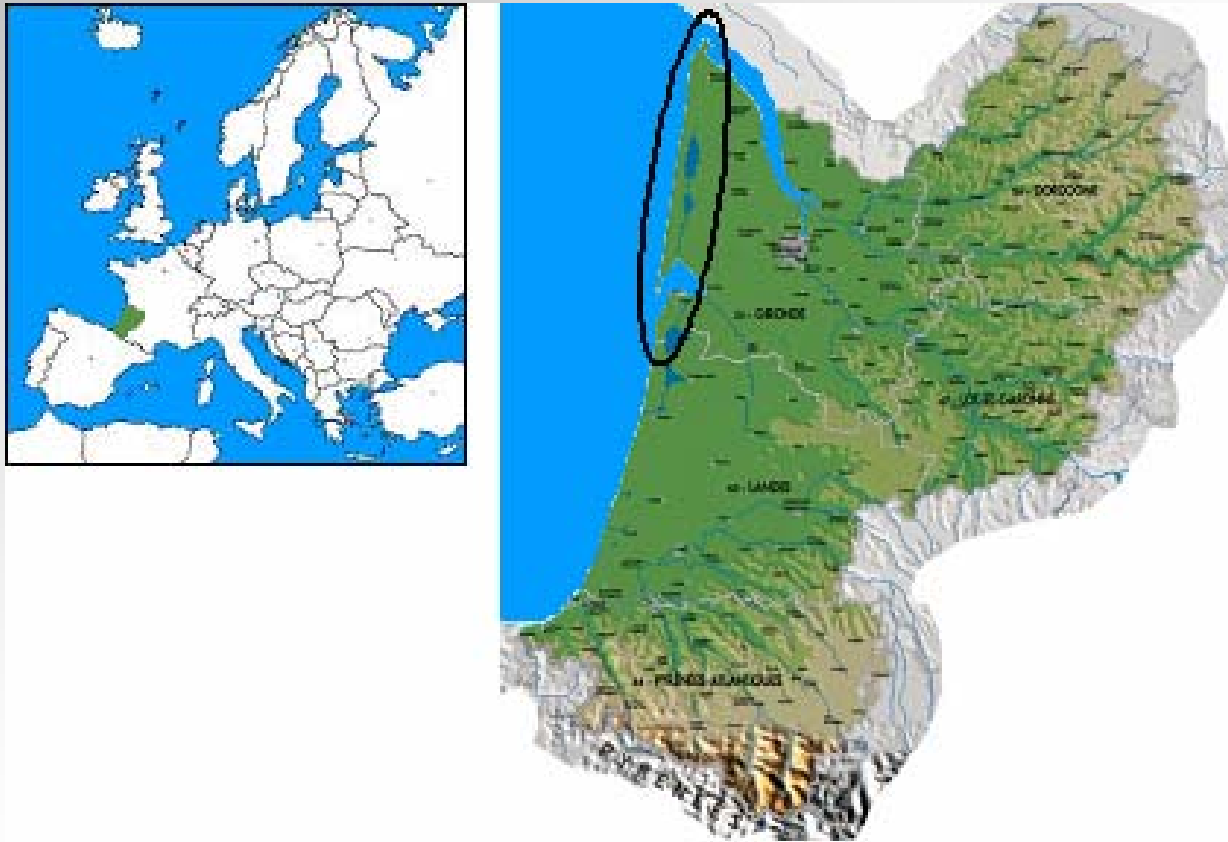
- Measures
 - Recreation value and benefit (not visitors' expenditure on site)
 - Compensating variation → Willingness to pay (WTP)
- 2 theoretical blocks
 - The Lancaster multi-attribute approach
 - The Random Utility Theory
- Discrete choice models
- The method identifies
 - The importance of recreation features in visit choice
 - The value of each policy = sum of the values of its components
 - A limitation of the method?

“Anormal” and “irrational” preferences

- Axioms of neoclassical theory \supset convex. differentiable and continuously defined preferences
- Tradeoffs between environmental and economic goods
 - ➔ Compensatory decision and exchange value
- Lexicographic preferences (Spash 2000)
 - ➔ Non compensatory decision and hierarchy of value; no exchange value nor WTP
- Strict and modified lexicographic preferences (Lockwood 1996. Rosenberger *et al.* 2003)
- Du to motivations (deontological. etc) or questionnaire design (complexity. bids levels. etc)
 - ➔ Identification of lexicographic preferrers
- Biased WTP ?

The study area

- Recreation in State owned forests, Gironde, France



The study area

Recreation supply

- 80% of the coastline are not urbanized
- 20.441 Ha of pine forests (87 km)
- Recreation policies
- Public financing
- No payment



Recreation demand

- \approx 13.6 millions visits
- Locals and tourists
- High seasonality
- Bordeaux and its vicinity < 1hr















Stages of the study

- A preliminary data collection that includes a pre-survey (April 2006. 93 quest.)
 - ➔ Population sample and survey strategy
 - ➔ Most pertinent attributes

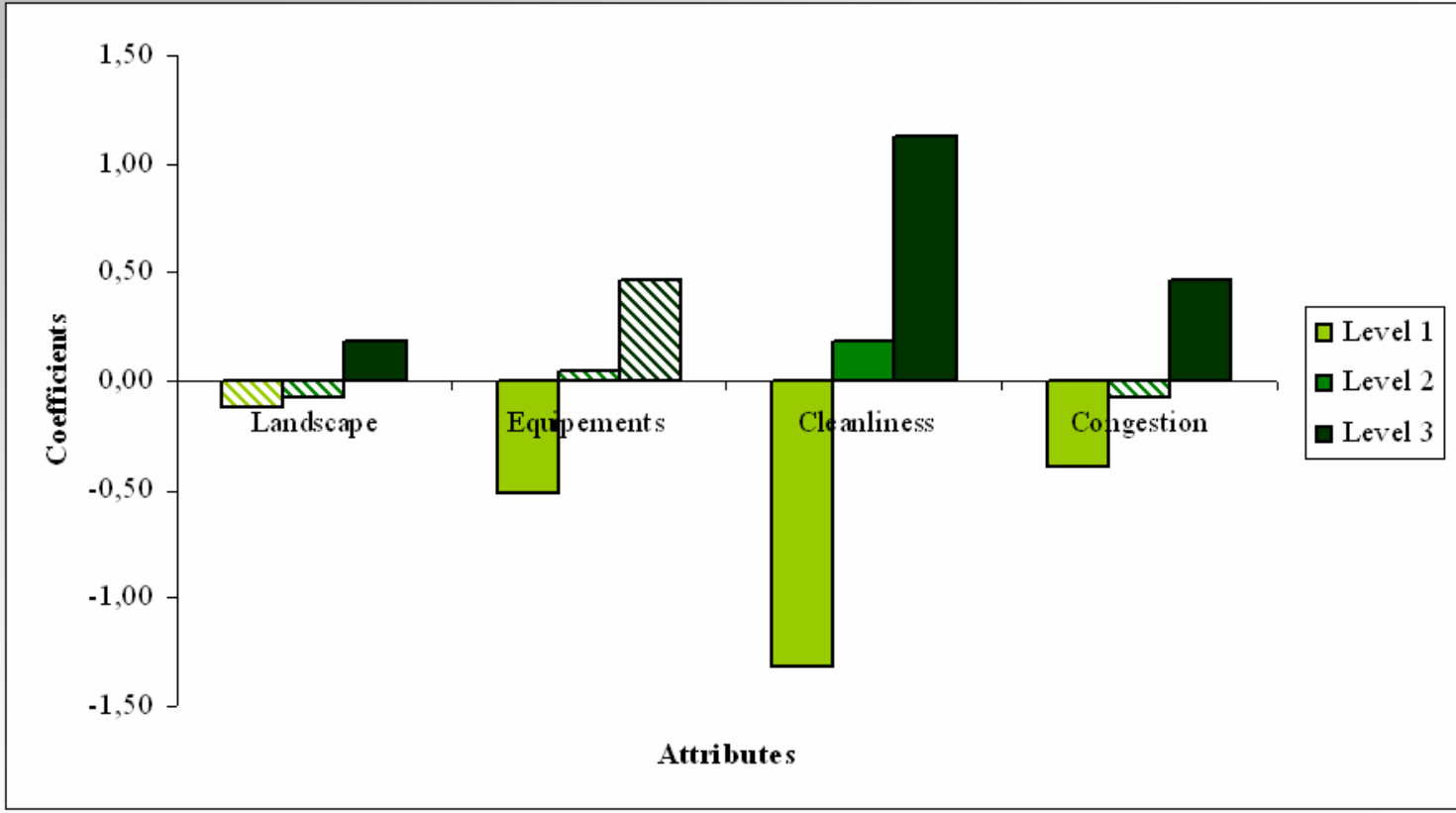
- A survey (August and July 2006. 168/386 quest.)
 - 5 attributes. 3 levels. represented by pictures
 - 8 choice sets (1 repeated)
 - 2 alternatives + the status quo are opposed in each choice set
 - Respondents have to choose their preferred one
 - Choose the scenario that gives them the highest level of utility
 - Are supposed to take all attributes into account and to trade-off
 - 3 dispositions of the attributes and 4 different valuation sequences
- ➔ Trade-offs between the attributes and visitors' WTP estimates

Example of a choice set

Attributes	1 st alternative	2 nd alternative	3 rd alternative (status quo)
Fill rate of the car park (congestion)	25% 	100% 	100% 
Equipments	paths 	paths and picnic tables 	paths 
Dustbins	collected every day 	collected every 2 nd day 	no dustbin 
Scenic quality (landscape)	sapling replanting 	bush replanting 	clearcutting without replanting 
Extra round trip distance	10 km	50 km	0 km
Choice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Variables	Coefficients (MNL)			
VEC Landscape 2	-0.07		(-0.48)	
VEC Landscape 3	0.19		(2.17)**	
VEC Equipments 2	0.04		(0.29)	
VEC Equipments 3	0.48		(1.32)	
VEC Cleanliness 2	0.19		(1.86)*	
VEC Cleanliness 3	1.13		(8.56)***	
VEC Congestion 2	-0.08		(-0.34)	
VEC Congestion 3	0.47		(1.91)*	
Distance	-0.02		(-2.54)**	
	Alternative 1		Alternative 2	
ASC	-2.41	(-3.76)***	-2.42	(-2.88)***
Household	0.36	(2.36)**	0.31	(2.02)**
Children	-0.69	(-3.07)***	-0.80	(-3.71)***
Urban	1.35	(4.60)***	1.11	(3.60)***
Retired	1.20	(2.61)***	1.15	(2.59)***
Visits	0.01	(4.77)***	0.01	(4.66)***
Rest	0.80	(3.44)***	0.83	(3.50)***
Time in forest	-0.35	(-6.58)***	-0.30	(-4.99)***
Criteria	0.83	(3.12)***	0.88	(3.39)***
Income (< 2 400 €)	-0.75	(-2.79)***	-0.91	(-3.27)***
1176 observations, log L = -693.91, McFadden pseudo-R ² = 0.41, Correct predictions = 66.58% / Wald test $\chi^2_{27} = 947.53$ ***				

Valorisation of the attributes



WTP estimates (/visit)

$$WTP = \frac{\partial U / \partial A}{\partial U / \partial d} = -\frac{b_A}{\phi}$$

Group

Individual

Attribute levels	WTP km	WTP € STC	WTP € with TC	WTP € STC	WTP € with TC
Landscape 2	-2.92	-1.16	-2.07	-0.34	-0.61
Landscape 3	7.82*	3.13*	5.58*	0.92*	1.64*
Equipments 2	2.04	0.82	1.46	0.24	0.43
Equipments 3	19.45	7.79	13.84	2.29	4.07
Cleanliness 2	7.86*	3.13*	5.58*	0.92*	1.64*
Cleanliness 3	46.95***	18.77***	33.42***	5.52***	9.83***
Congestion 2	-3,13	-1.26	-2.24	-0.37	-0.66
Congestion 3	19.11	7.65	13.6	2.25	4.00

Prevalence of the cleanliness → lexicographic preferences?

The lexicographic preferences: identification

Others models

- No satisfactory results with mixed and latent class logits

Questionnaire design

- Follow up question
 - 50.60% "easy" or "very easy" and 26.79 "neither easy nor difficult"

Motivations

- Declared lexicography (n=57)
 - Follow-up question
 - 35.12% attached importance to 1 attribute in making choices (73% cleanliness)
- Apparent lexicography (n=115)
 - Descriptive statistics on choices
 - Identification of the respondents who always chooses the alternatives proposing a given level of an attribute
 - 68% made choices depending on 1 level (57% highest level of cleanliness and 37% smallest level of distance)
- Mixed lexicography → cross-variable (n=38)

The lexicographic preferences: treatments

- Lexicographic preferences
 - Few statistical differences between the populations (e.g. lexico and non lexico)
 - Variable in the multinomial logit → significant for the three types
 - Conditional logit with sub-populations
 - Declared lexicography → only the highest level of cleanliness is significant (no more the distance-price attribute)
 - Apparent lexicography → highest level of cleanliness and distance are significant
 - Mixed lexicography → attributes are all insignificant
 - No statistical difference between estimates using the “rational” individuals and the total population

Concluding remarks and future prospects

- Dominance of “modified” lexicographic
 - Focus on cleanliness but trade-off with the price
 - Limited distortions caused by “strict” lexico
 - In the present case. recreation is not a “critical” issue
 - ➔ WTP estimates for specific attributes
- Identification of “strict” lexicographic preferrers?
 - Methods & models
 - Motivations
- Trade-off between the attributes other than cleanliness?
- Comparison with tourists?
- How to include strict lexicographic preferrers in economic assessment (e.g. social choice)?