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FOR CLIMATE CHANGE
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The Impact of Preferences and Socio-Economic Factors on Households' Travel Mode Choice

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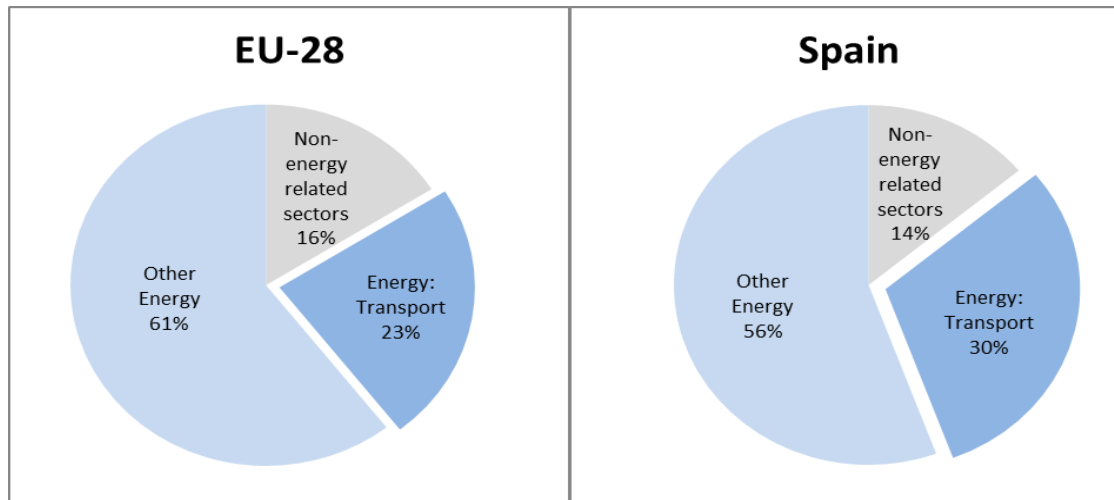


Figure 1 EU's and Spanish Transport and energy related shares of GHG emissions in 2016. Source: Eurostat.

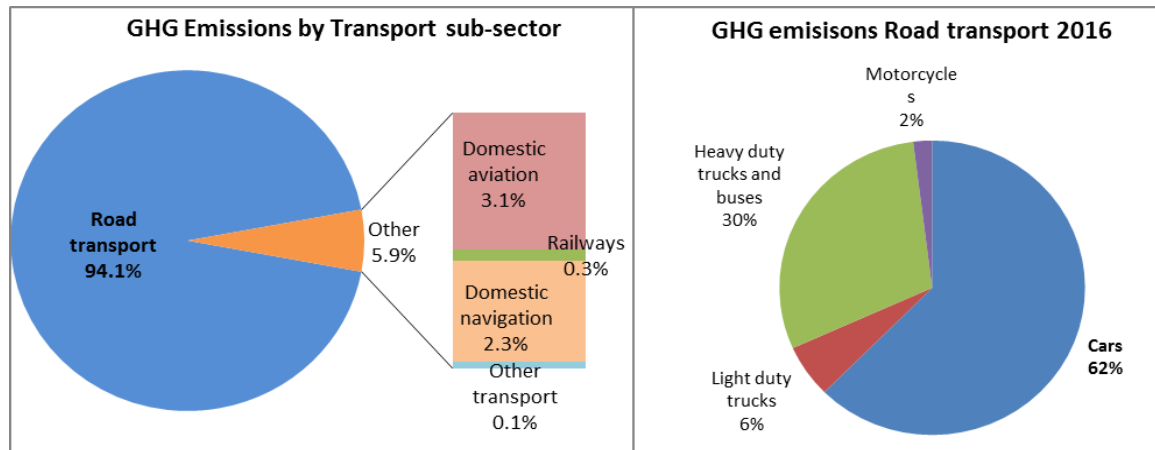


Figure 2 Spanish GHG Emissions of transport sectors by sub-sectors in 2016; Spanish GHG emissions from different road transport modes in 2016. Source: Eurostat.

Shifting away from private vehicle dependency

- “[Cities and local authority] ..encouraging **modal shift** to active travel (cycling and walking), public transport and/or shared mobility schemes”
[Communication “A EU Strategy for low-emission mobility”, 2016]
- Understanding people’s routine mobility choices in EU countries
 - Preliminary to policy design
- **Objective:** what do different sets of attributes tell us about how we travel?
- **Why?** delivering recommendation on the design of policies to tackle modal shift

A household survey in 5 EU countries...

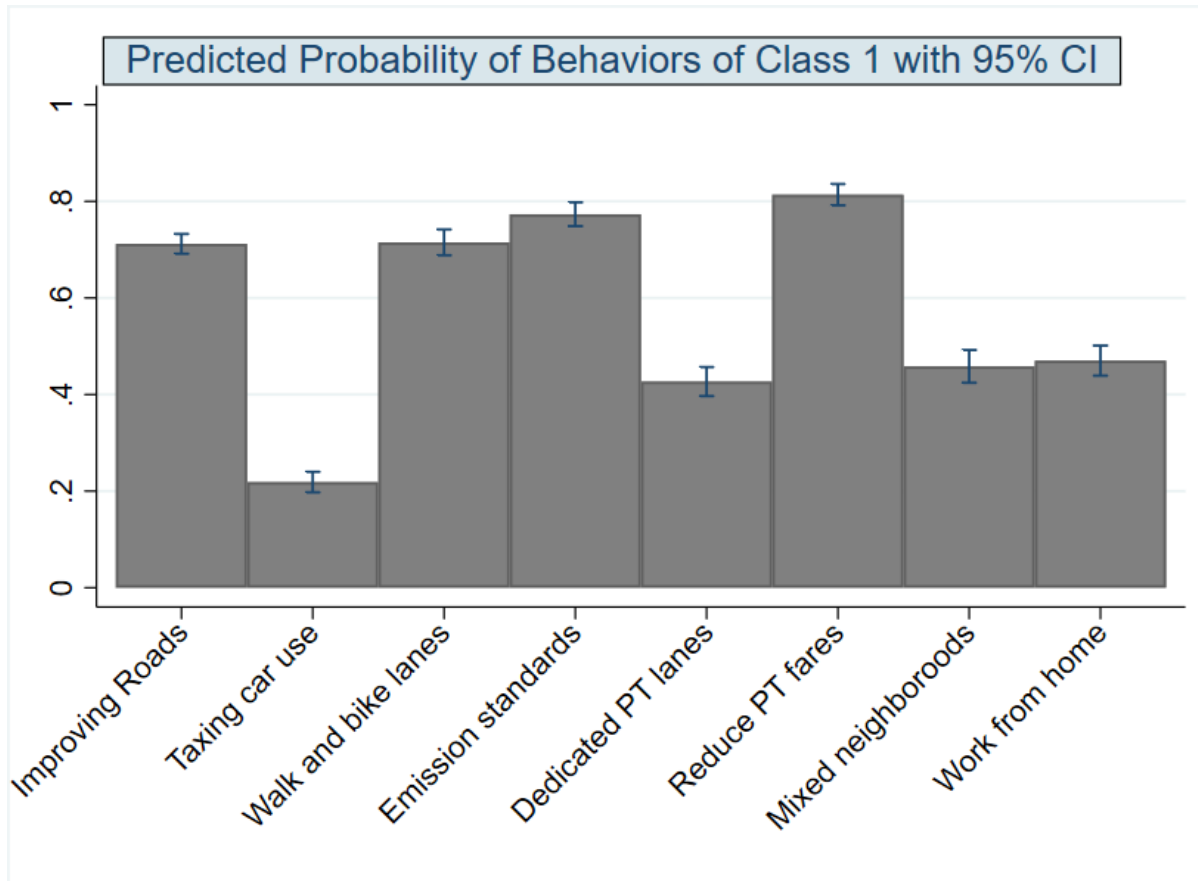
- Socio-demographic characteristics
- Mobility section (12 questions)
 - Routine Trips description
 - Attributes affecting mode choice
 - Support to political measures
 - Perception of transport externalities
- Countries: Hungary, Italy, Norway, Poland, Spain (5028 obs.)

Analysis

- Trip to workplace/university (2734 final obs.)
- 3 modes: Private vehicle, Public transport, Active modes
- Small, medium and large cities
- Latent class analysis (LCA)
 - Support to policy intervention
 - Perception of transport externalities
 - Pro environmental attitudes
- Multinomial logistic regression

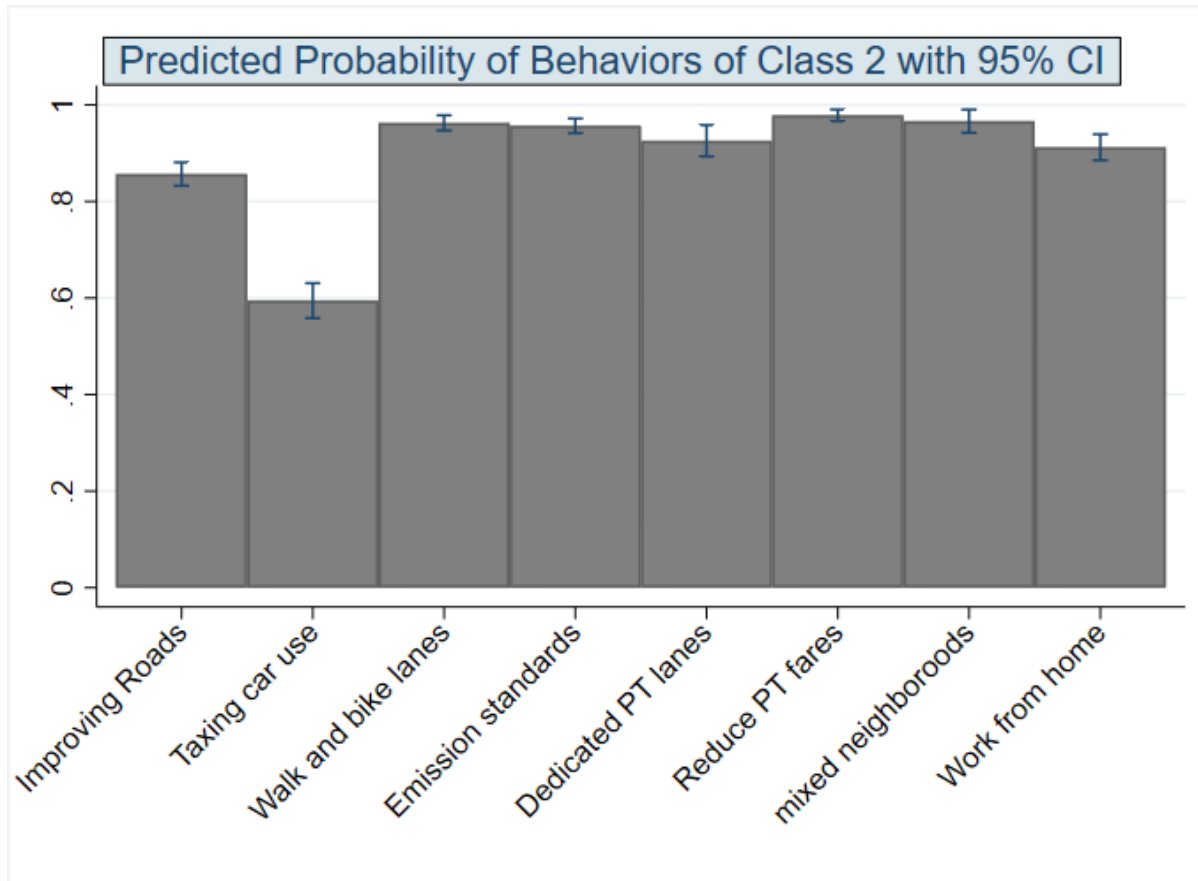
LCA: Policy intervention.

Class 1: Soft intervention supporters



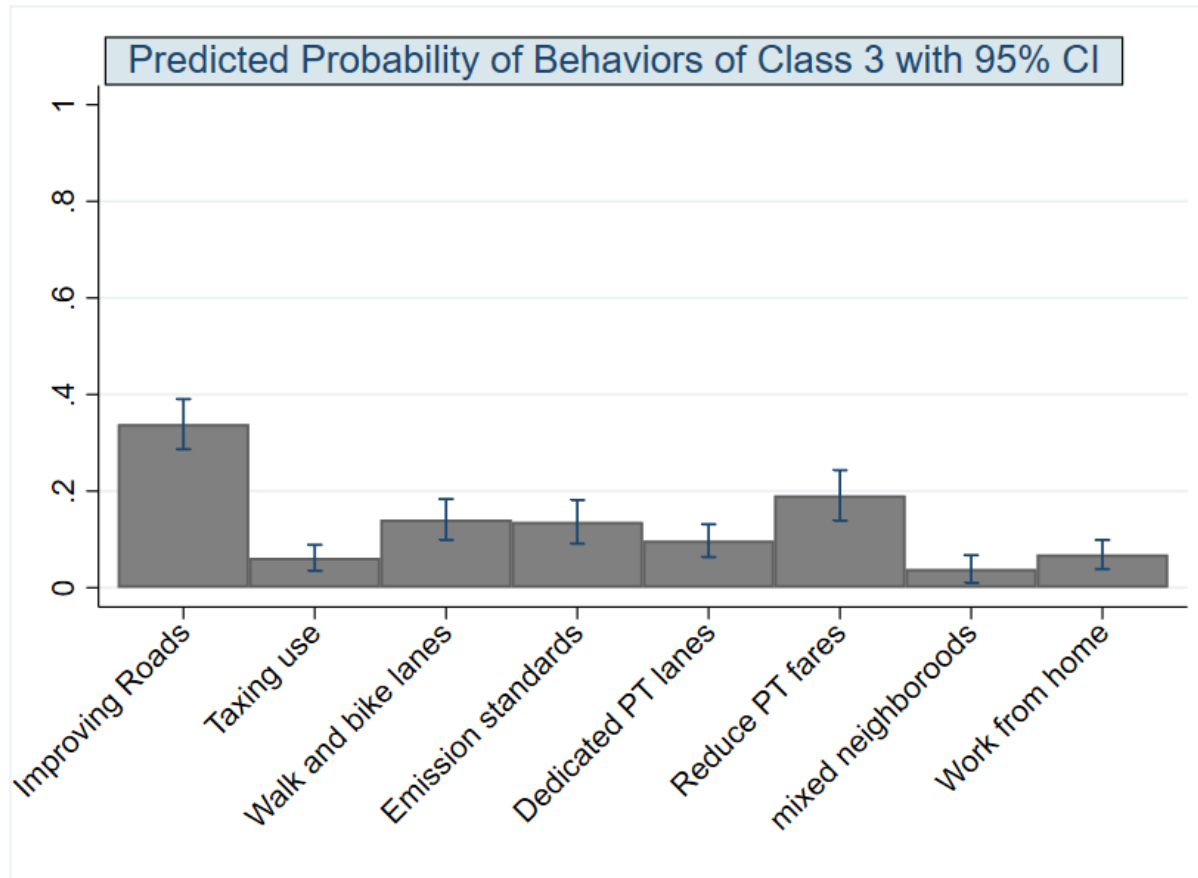
LCA: Policy intervention.

Class 2: Strong intervention supporters



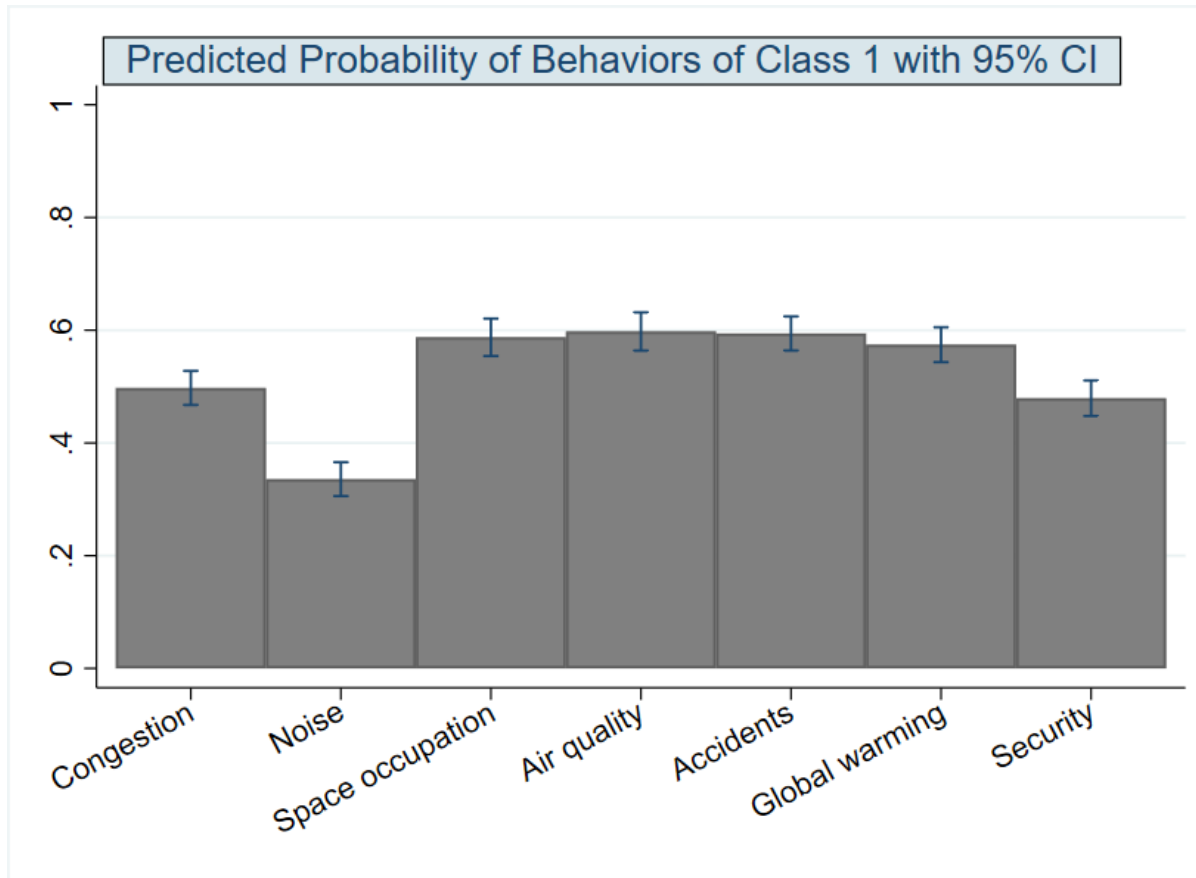
LCA: Policy intervention.

Class 3: No intervention supporters



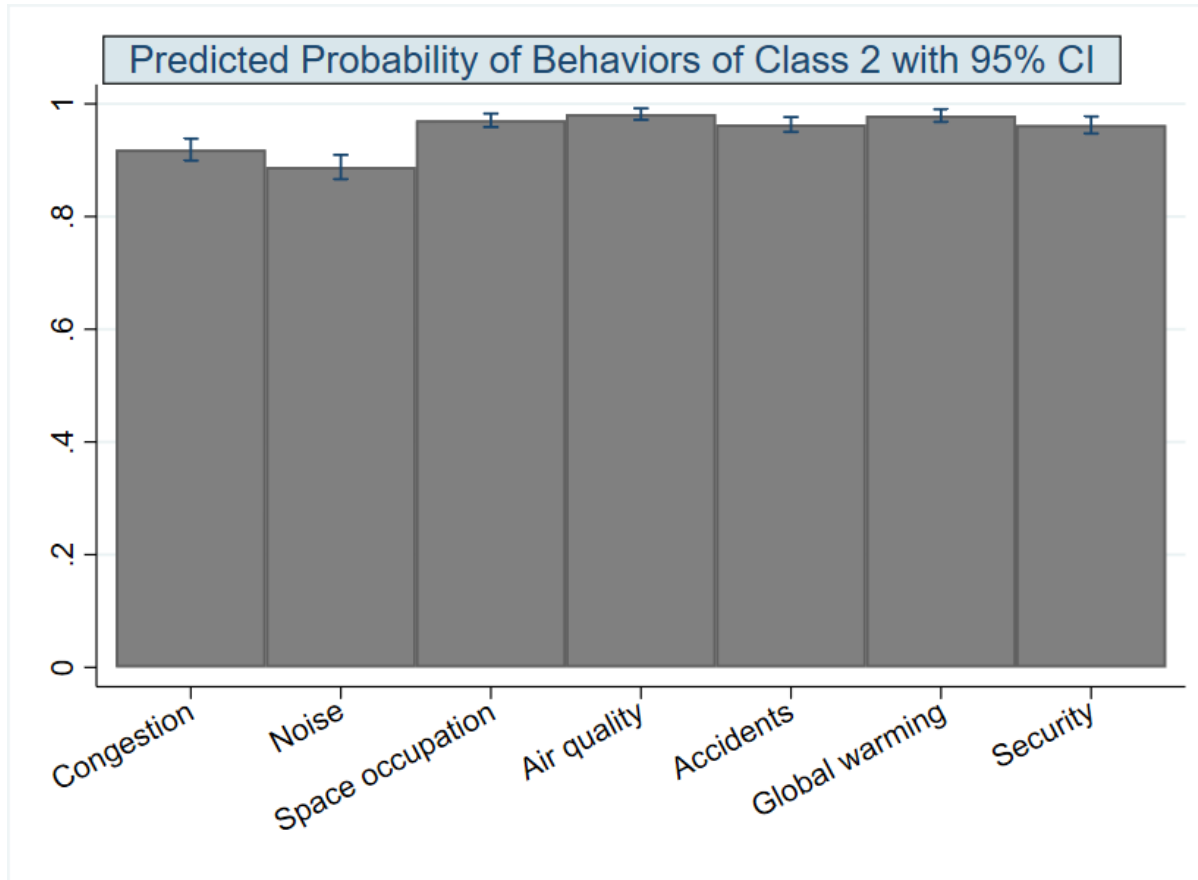
LCA: Perception of Externalities.

Class 1: Somewhat sensitive



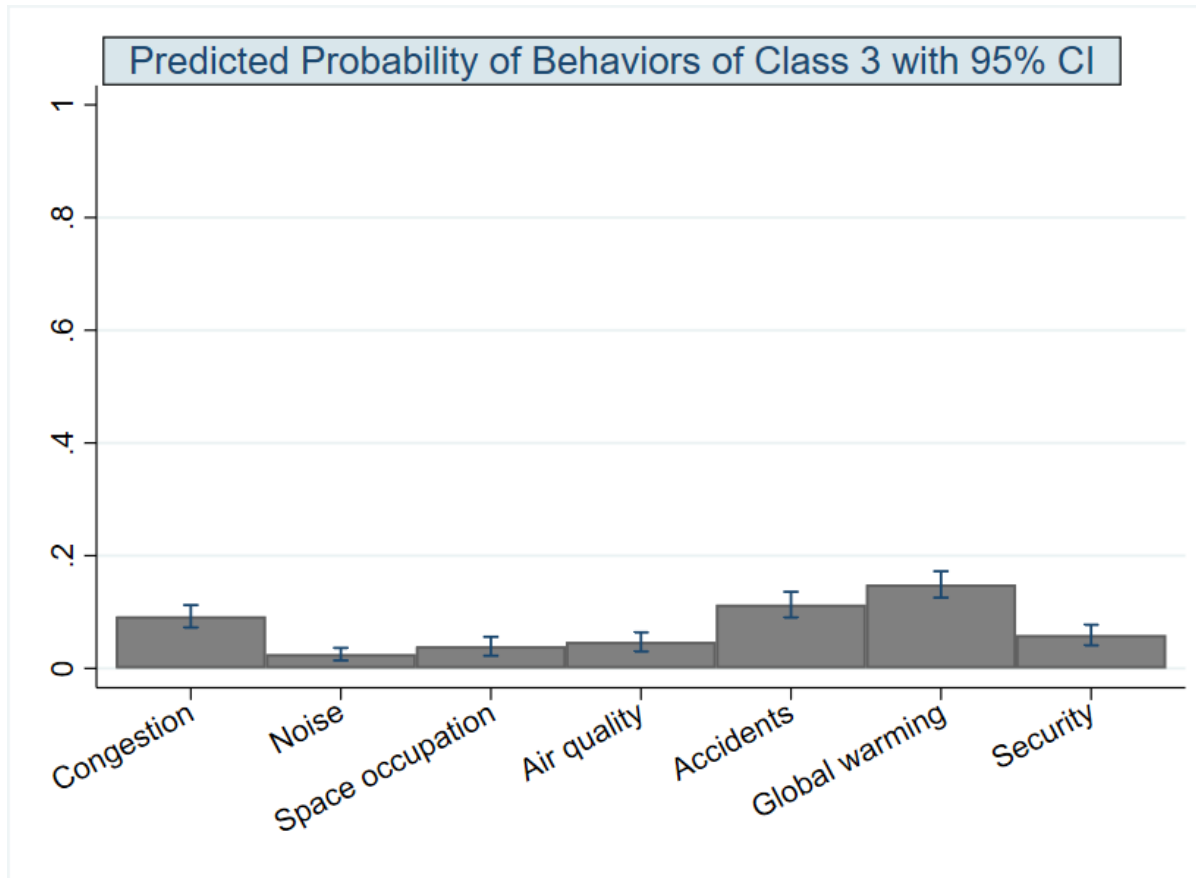
LCA: Perception of Externalities.

Class 2: Highly sensitive

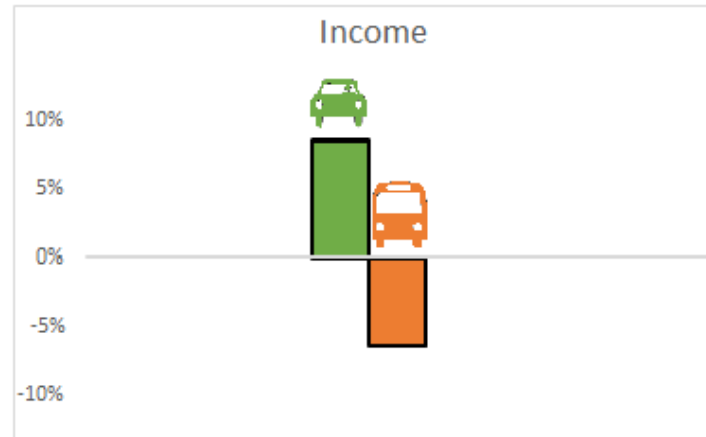
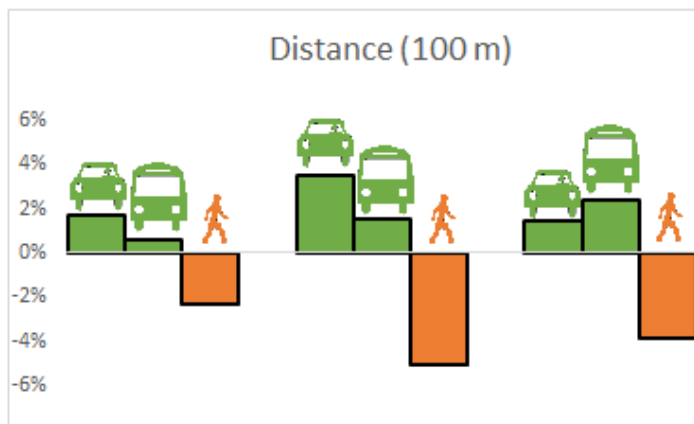
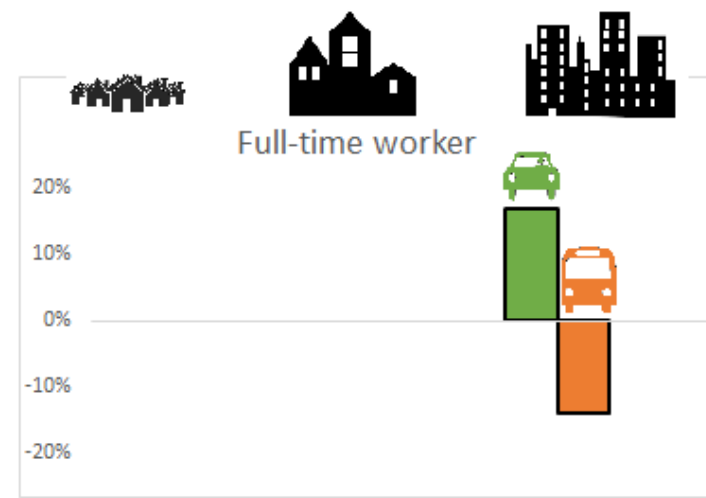
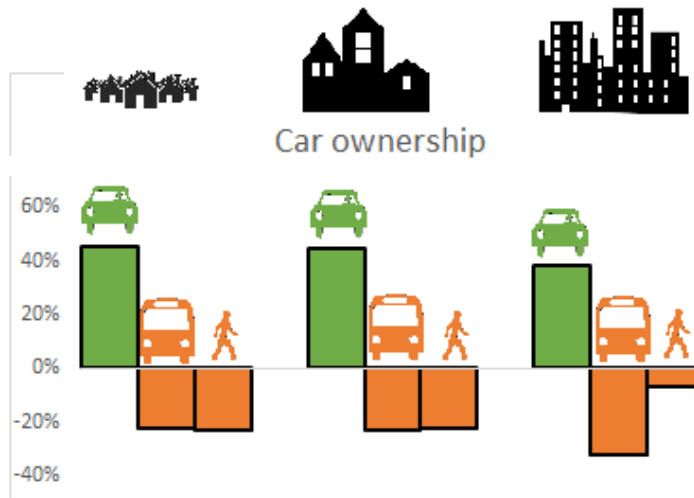


LCA: Perception of Externalities.

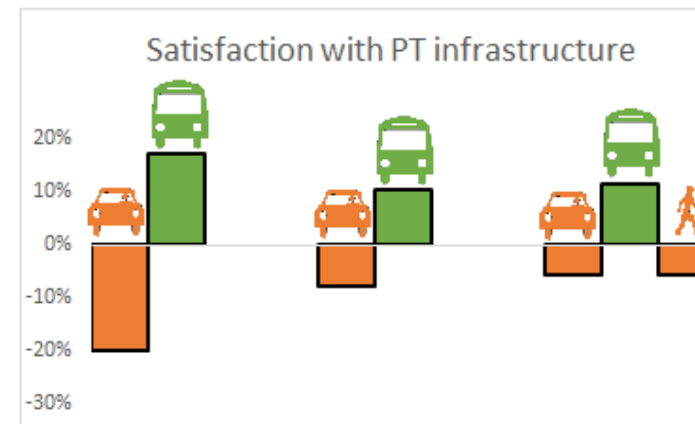
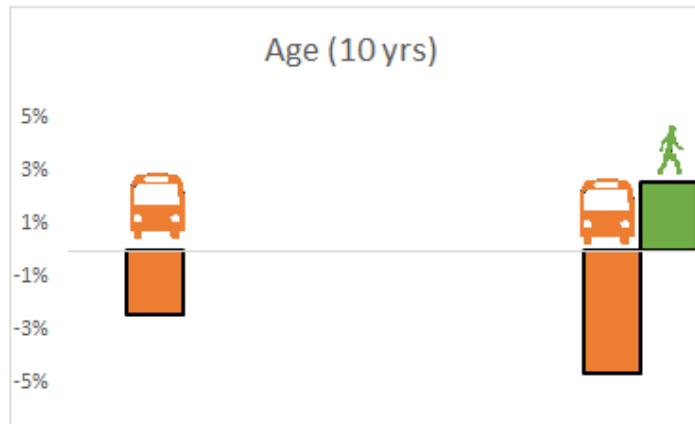
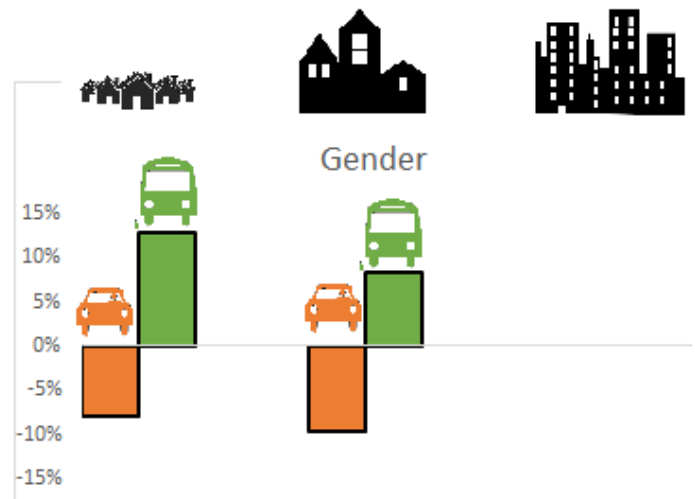
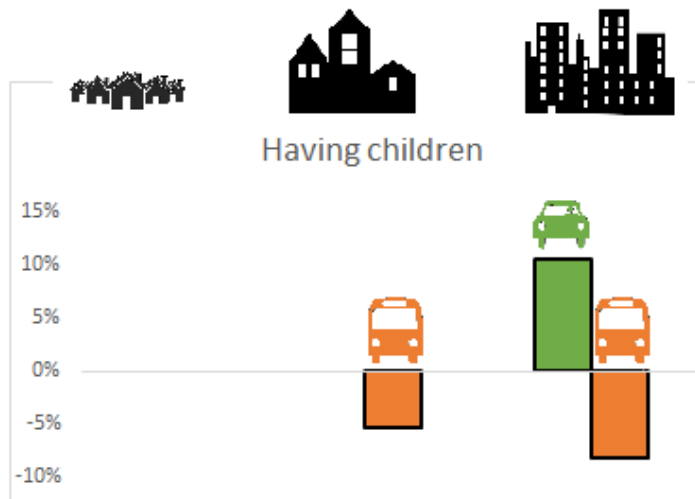
Class 3: Insensitive to externalities



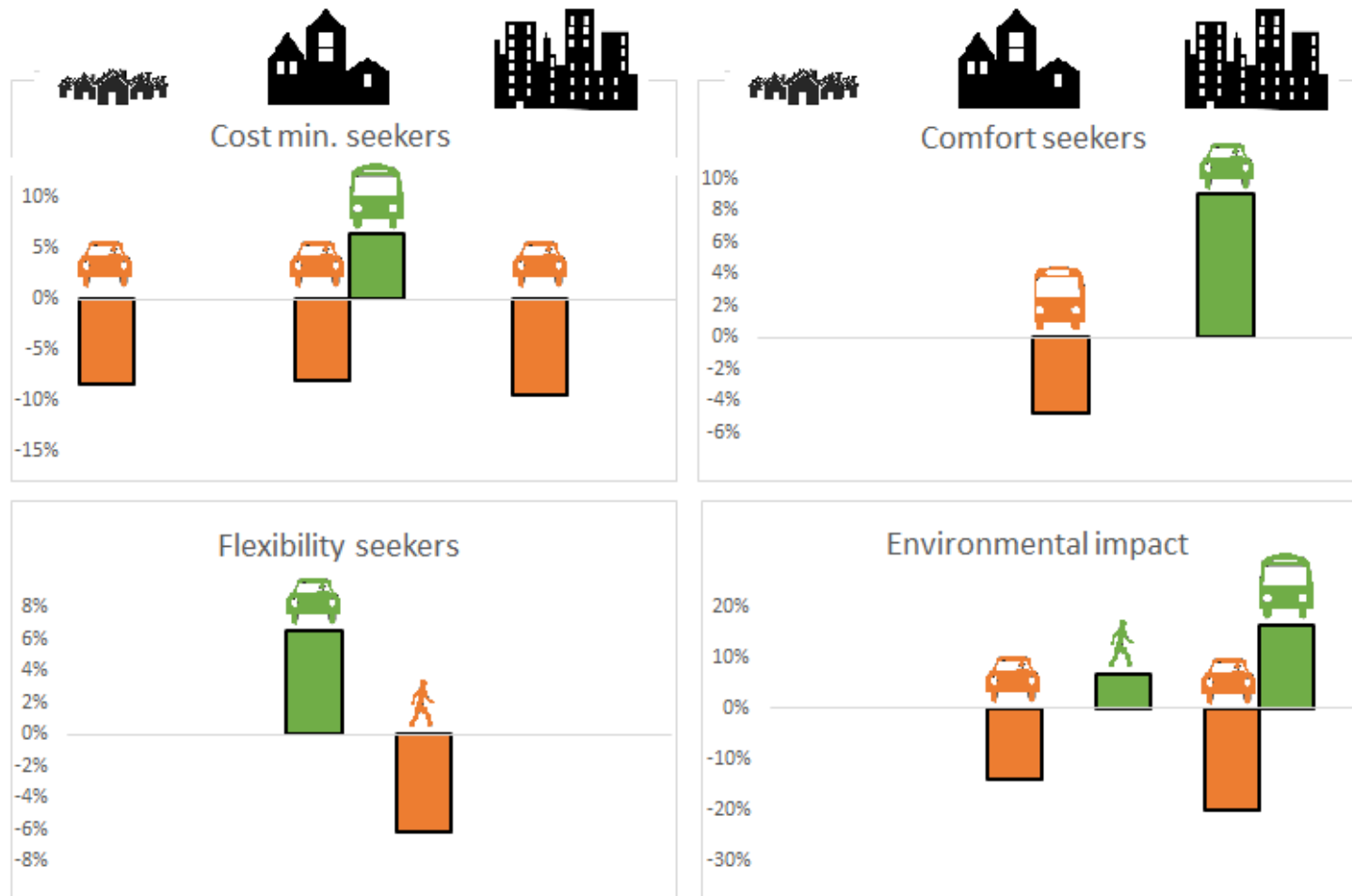
MNL: Trip characteristics and work conditions



MNL: Respondent characteristics

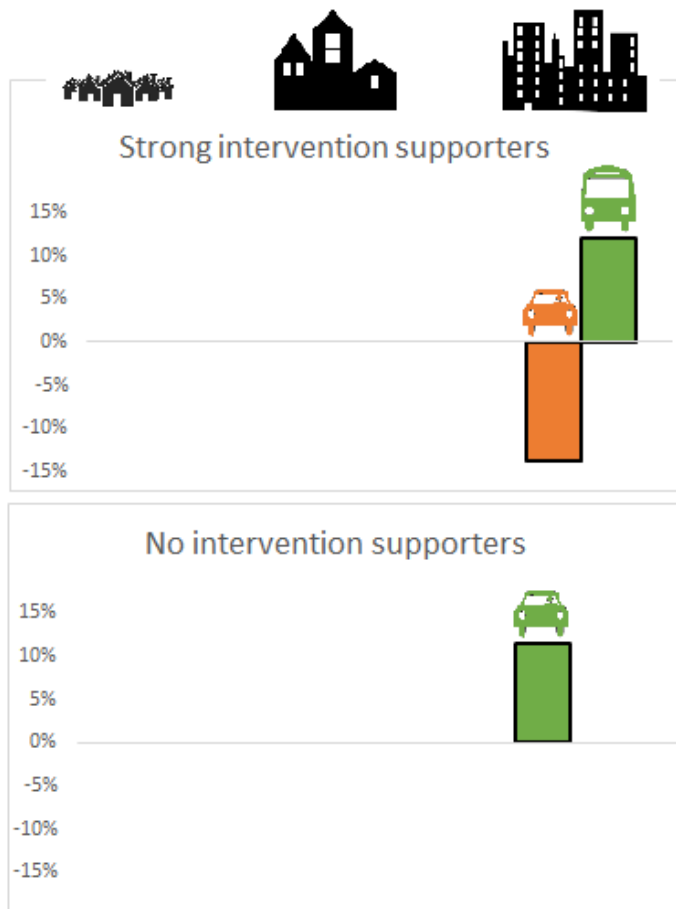


MNL: Attributes valued as important

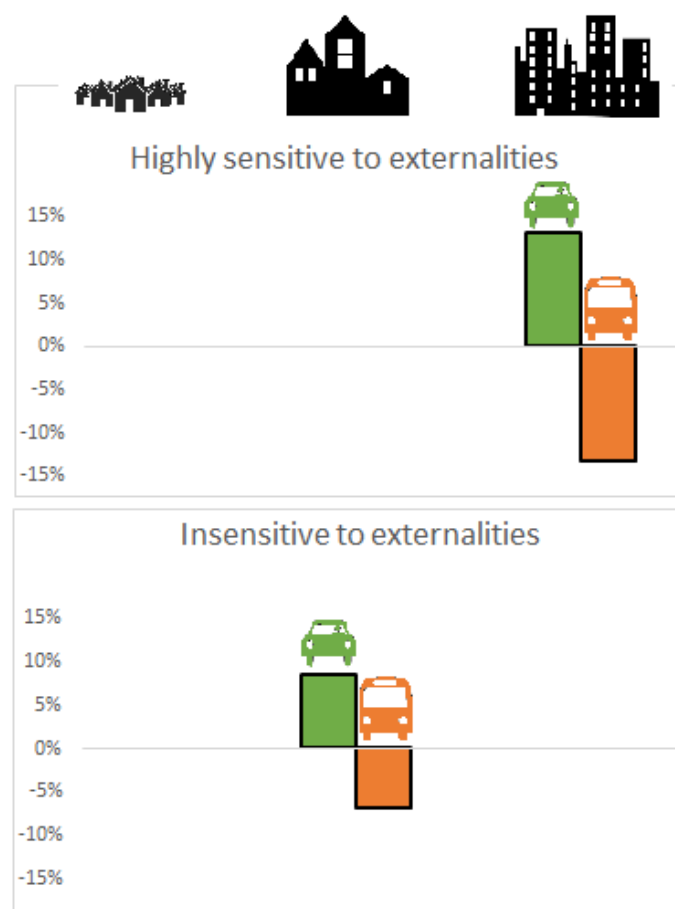


MNL: Preferences

Policies



Externalities



Discussion

- **Attributes** preferences are reflected in travel mode decisions
- Those more supportive of **transition policies** are more likely to be *public transport* users, while the opposite stands for *private vehicle* users
 - Public transport users may be more favourable to mobility transition
- Those who have higher sensitivity to **transport problems** are more likely to be private vehicle users
 - Private vehicle users could receive higher benefits from reduction of transport externalities
- And pro-environmental attitudes?
- Role of gender
 - Household self-selection?

Limitations and further analysis

- Cross-sectional data
- Causal inference, what affects what?
- Unobserved cost and availability of options
- Integration of external data (location specific, price?)
- Country specific analysis
- Further research: policy design and testing, other trips

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Thank you.

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Class distribution

	Delta-method			
	Margin	Std. Err.	[95% Conf. Interval]	
A				
1	.5547847	.0150206	.5251867	.5839991
2	.3203079	.0172918	.2874035	.3551022
3	.1249074	.0085927	.1090159	.1427443

	Delta-method				
	Margin	Std. Err.	z	P> z	[95% Conf. Interval]
_predict					
1	.37642	.0097891	38.45	0.000	.3572338 .3956062
2	.3214341	.0095845	33.54	0.000	.3026488 .3402194
3	.3021459	.0098734	30.60	0.000	.2827944 .3214974

Variable	Description	Stat
Workplace/University Mode	Categorical variable indicating the main mode used for the workplace /university trip. Categories: Private Vehicle, Public Transport, Active modes.	PV = 58% PT = 25% AM = 17%
Trip Characteristics		
Distance	Distance in kilometres from the starting point to the destination	Work = 11,3
Attributes (stated as Very important in the Likert scale)	Dummy variables indicating the importance of the specific attribute in the decision of the mode to take.	<i>Percentage variable =1</i>
Cost	Cost of the trip	36,4%
Comfort	Comfort provided by the travel mode	34,2%
Flexibility	Flexibility provided by the travel mode	38,0%
Environmental Impact	Concerns about the travel mode's impact on environment	24,7%
Infrastructure satisfaction	Dummy Variables indicating a high or very high satisfaction level with respect of different transport related infrastructures	<i>Percentage variable =1</i>
PT satisfaction	Average value between satisfaction with the public transport timetables and coverage	34,6%
Socio-economic factors		
		<i>Percentage variable =1</i>
Highly Educated	Dummy variable which takes value 1 for university or higher education level	29,7%
Age	Age of the interviewee	48,8(Mean)
Fulltime Worker	Dummy variable which takes value 1 if the interviewee is a fulltime worker	49,3%
Female	Dummy variable taking value 1 if the interviewee is female	54,6%
Children	dummy variable indicating if the household has children	0= 60,9% 1= 39,1%
Income	Dummy variable taking value 1 if the household state their present income allows to live in a sufficiently comfortable manner.	71,8%

	Private Vehicle	Public transport	Active modes	TOT
Small	464	106	101	671
Medium	713	181	215	1109
Large	419	391	144	954
TOT	1596	678	460	2734