

# Car-sharing – Driving in the right direction?

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# Structure of the presentation



1. Introduction
2. Results
  - A. Exploratory data analysis
  - B. Modelling the willingness to share cars
  - C. Willingness to pay for shared cars
  - D. Environmental analysis
3. Policy implications

# 1. Introduction

- A. Research questions
- B. Scope of the research
- C. Methodology





# Research questions

- Which type of **consumers** are (not) willing to step into a car-sharing system?
- Which type of **car-sharing system** is valued the most?
- What is the **environmental impact** of car-sharing?
- How can policy makers **incentivize people** to share cars instead of owning them? And should they?



# Scope

- car-sharing, not ride sharing
- Both P2P and B2C systems
- No B2B
- Both for profit and not-for-profit initiatives
- Focus on Flanders (and Brussels)
- Not informal car-sharing (for example, parents sharing with kids)



# Methodology

- Online **consumer survey** on mobility and car-sharing
  - Which people who are willing to share cars?
  - What kind of car-sharing system are people looking for?
  - How do people change their behavior when they start sharing cars?
  - What's the environmental impact?
- **Interviews** with *autodelen.net* and three car-sharing firms



# 2. Results

## A. Exploratory data analysis

B. Modelling the willingness to share cars

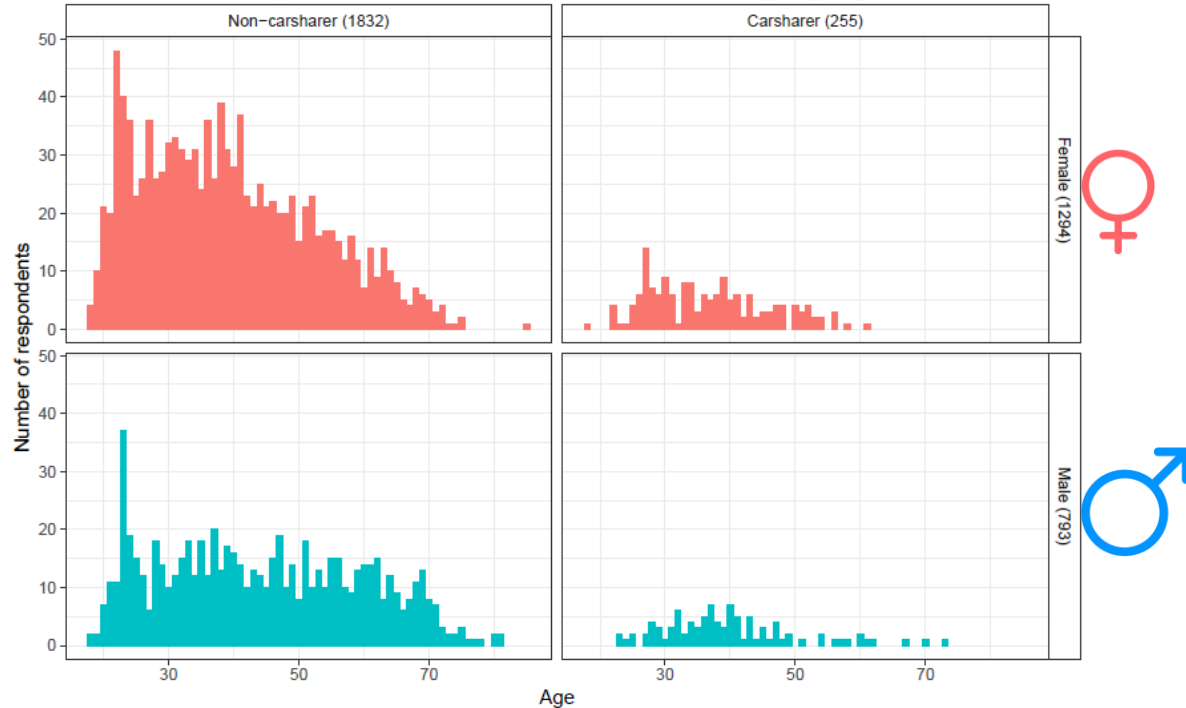
C. Willingness to pay for shared cars

D. Environmental analysis





# Demographics

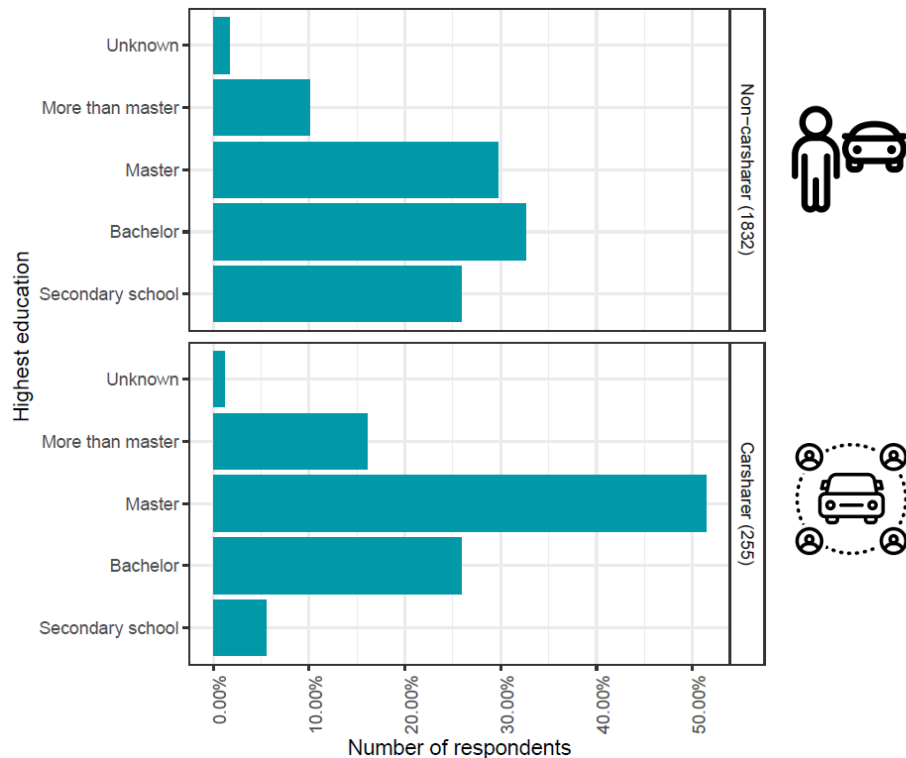








# Education

There are significantly more people with a **Master degree** or **higher** in the car-sharing population





# Employment

	Non-sharers 	Sharers 
Students	+	-
Retired	+	-
Part-time workers	-	+



# Living environment



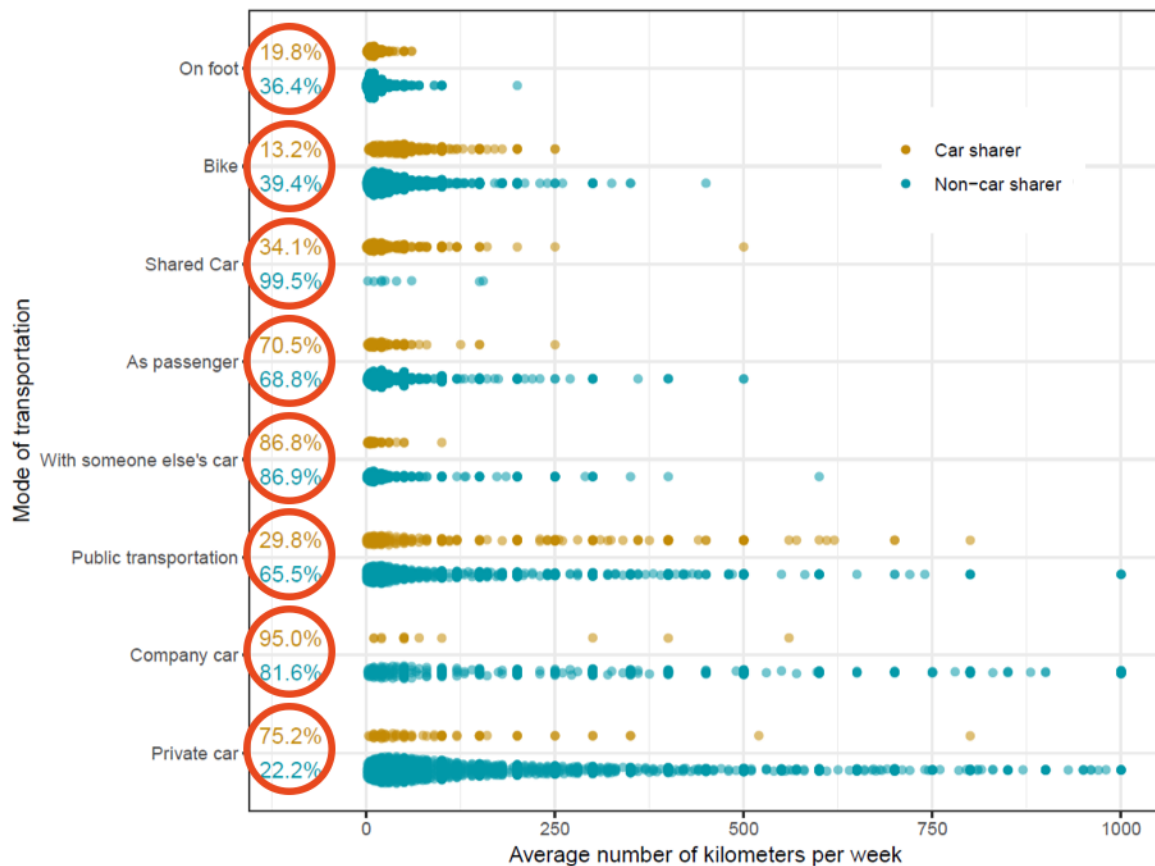
		Flanders average	Distribution among non-sharers*	Distribution among sharers*
Province	Antwerp	28%	22%	20%
	East Flanders	23%	26%	56%
	West Flanders	18%	11%	4%
	Flemish brabant	17%	23%	15%
	Limburg	13%	16%	1%
	Brussels		1.5%	5%
Living environment	Rural		42%	9%
	Suburban		33%	26%
	Urban		25%	65%

\* percentage of survey participants



# Current mobility habits

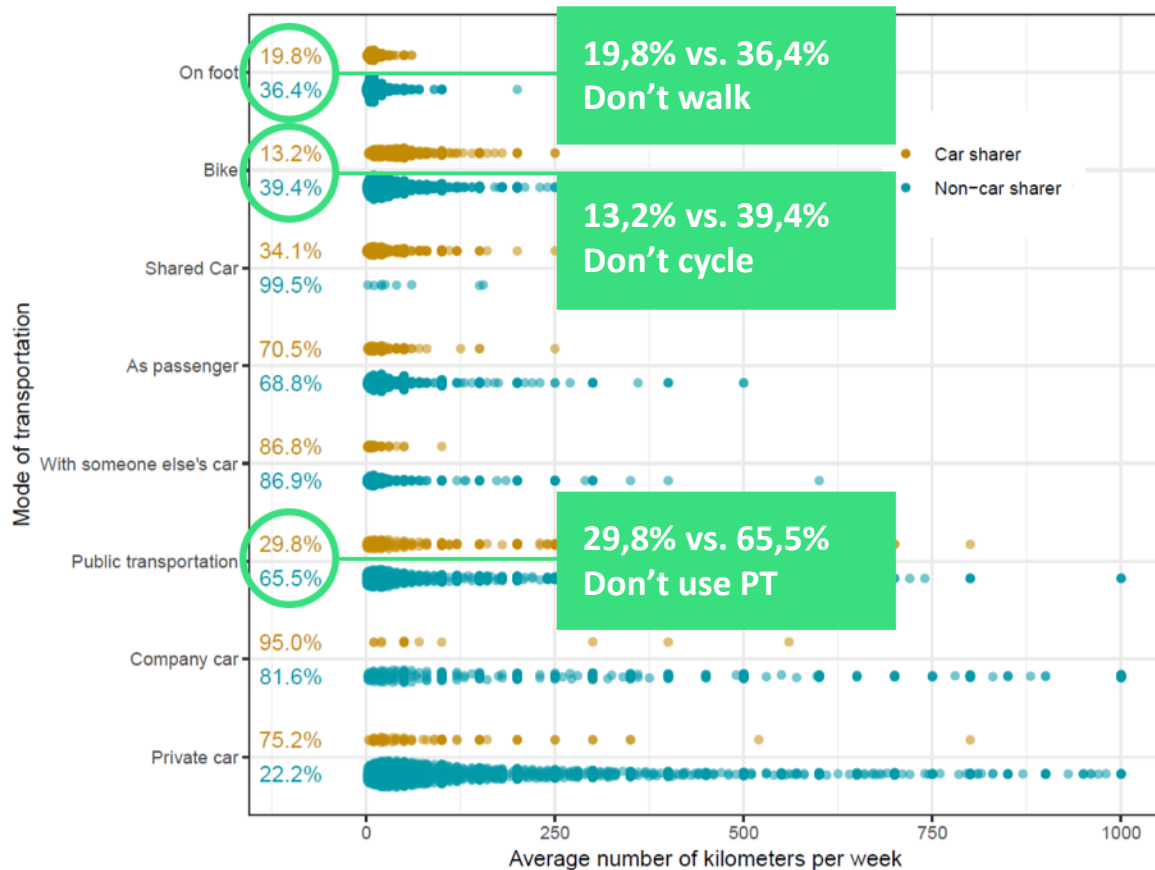
% of respondents that does **not** use the transportation mode





# Current mobility habits

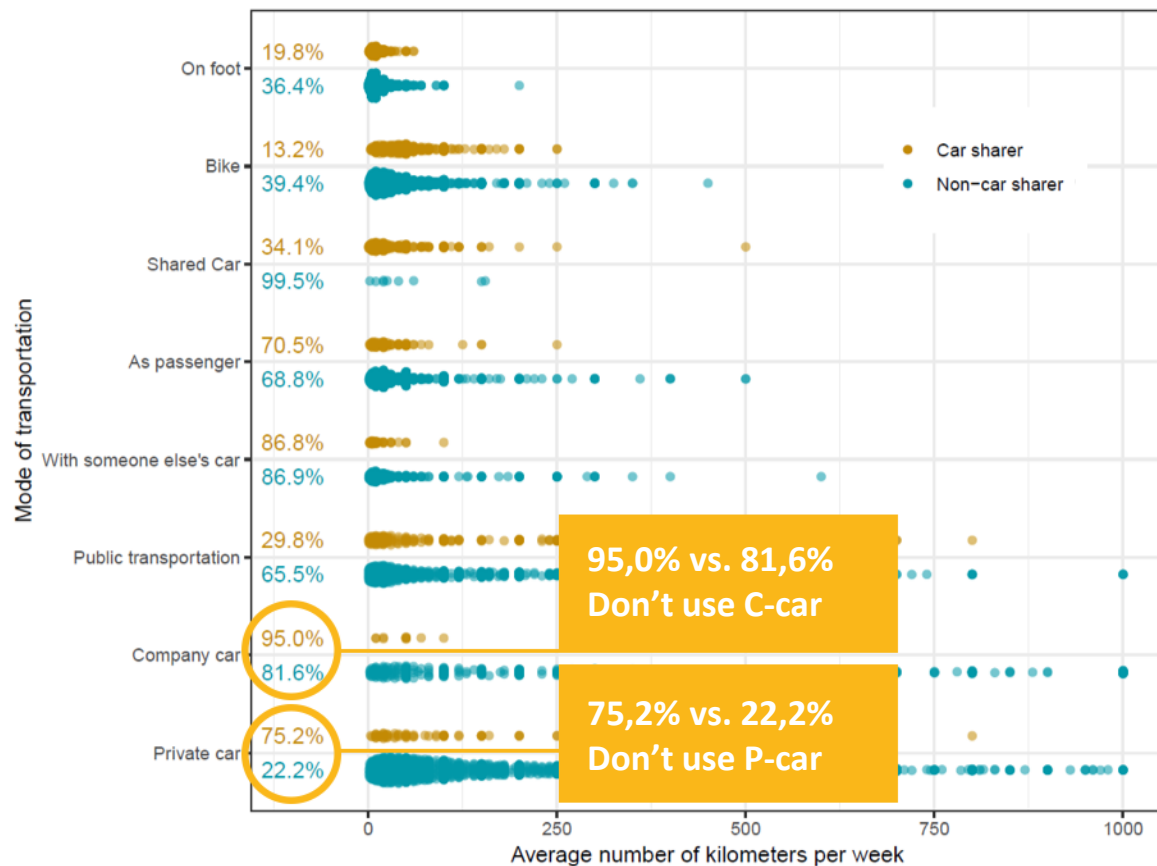
Car-sharers walk, bike and use public transport more often





# Current mobility habits

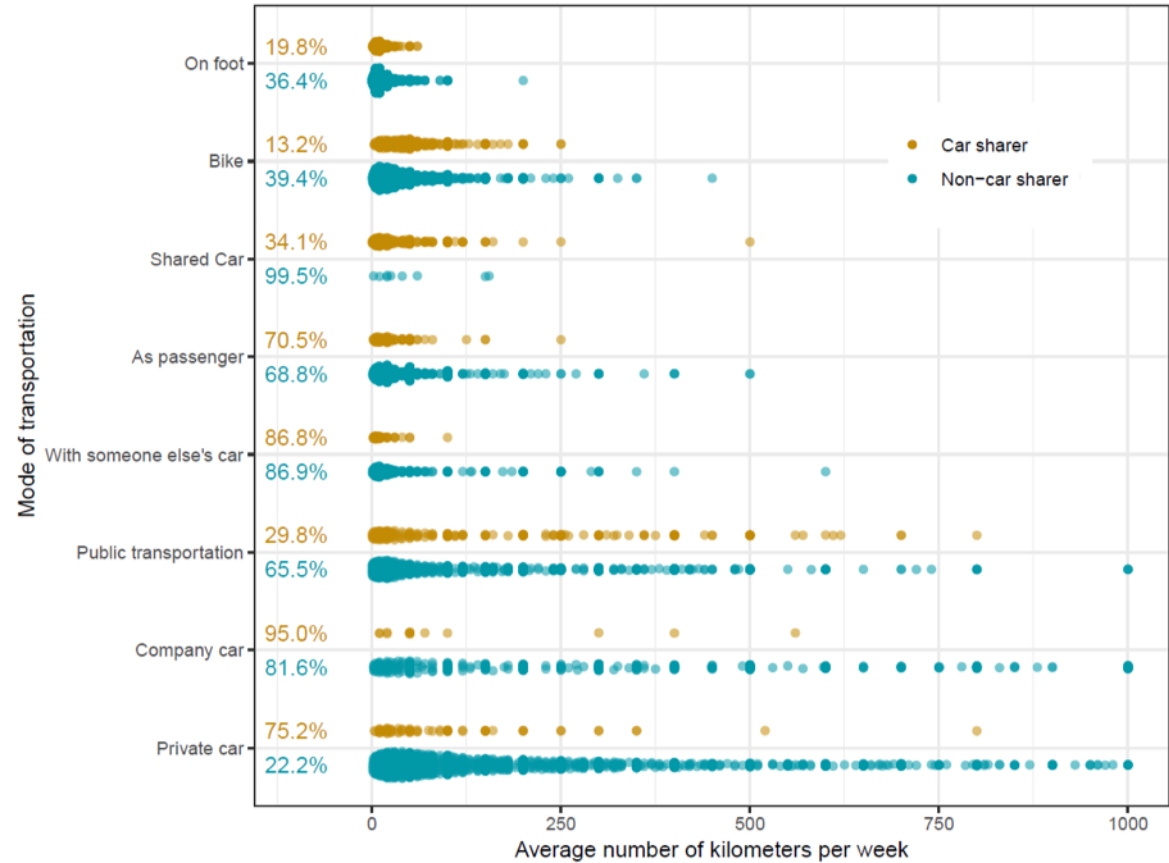
Car-sharers drive less  
with personal or  
company cars





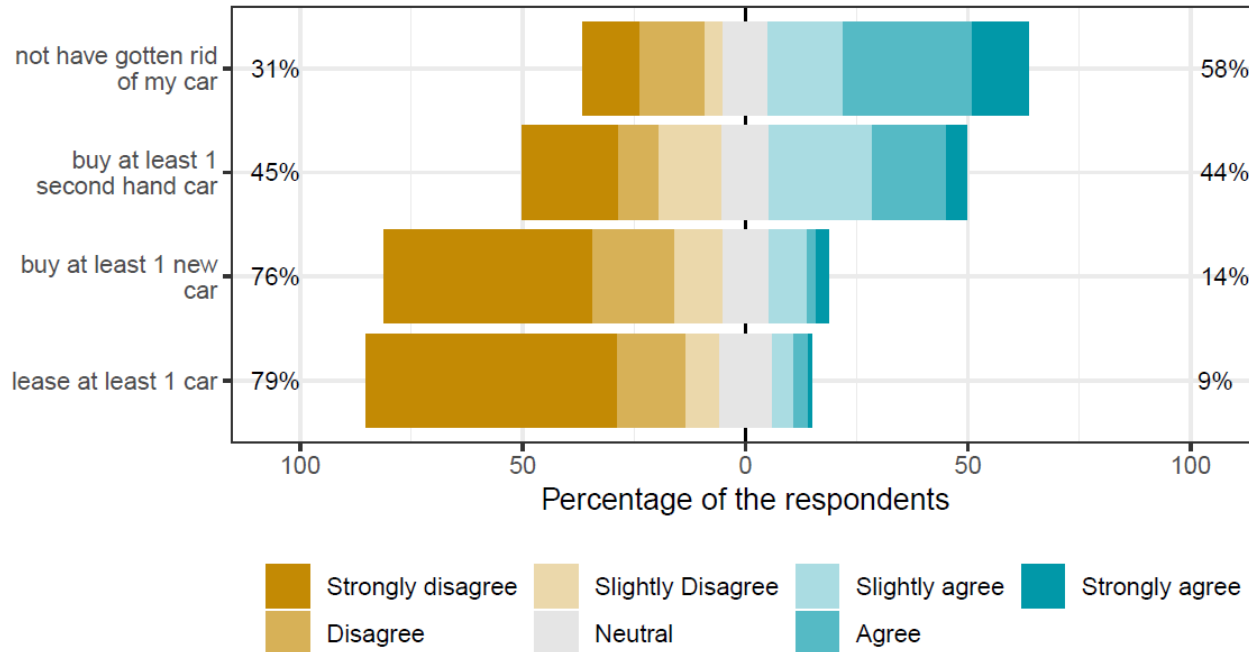


# Current mobility habits





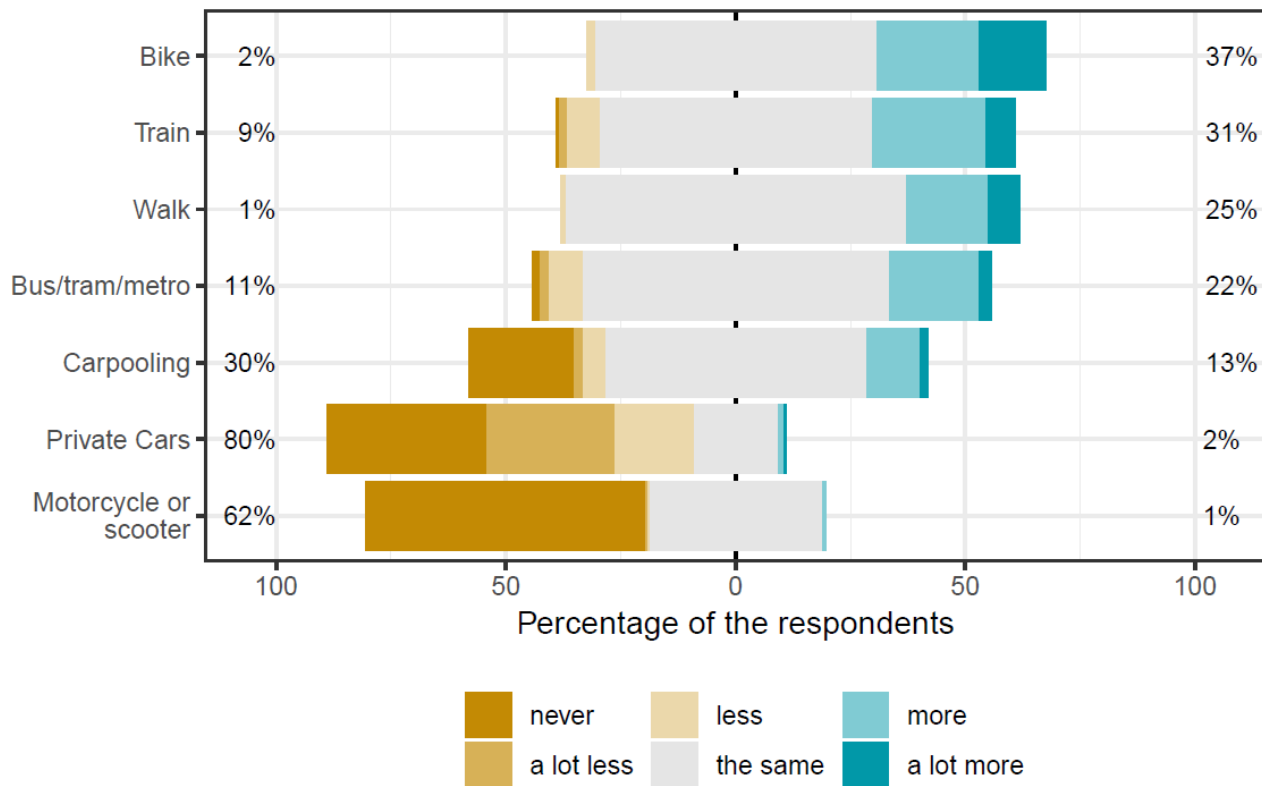
## “If I was not a car-sharing member, I would...”



Important to estimate the car ownership that was avoided through car-sharing



## Changes in mobility since joining a car-sharing system



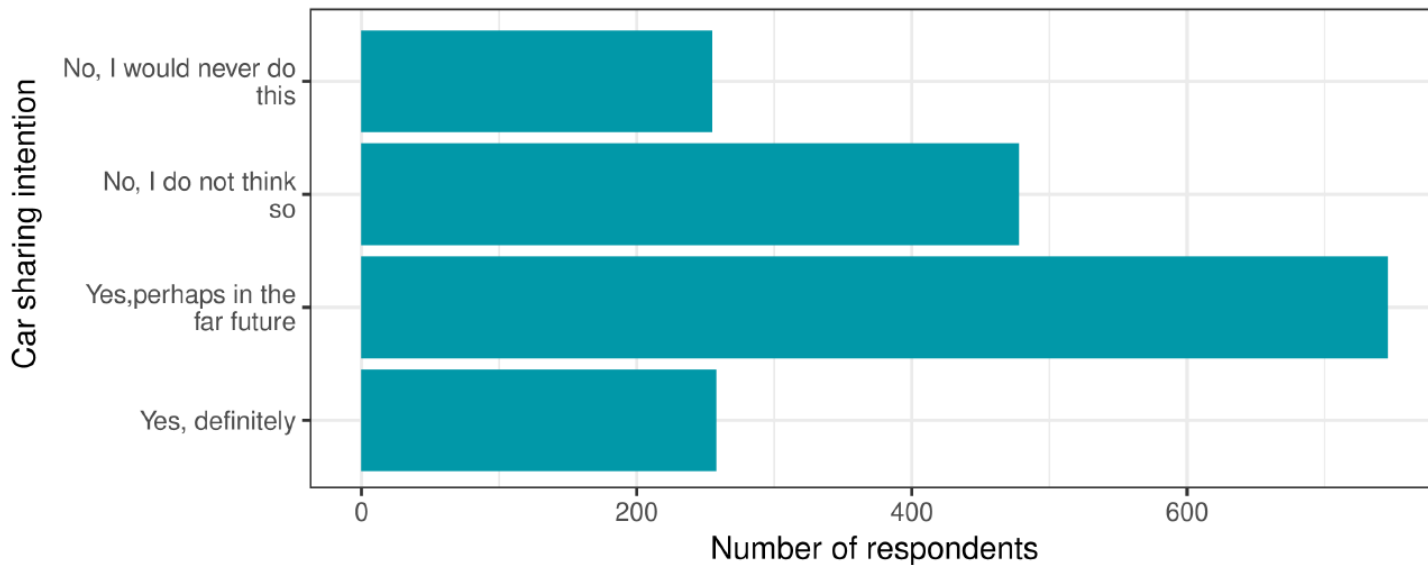
## 2. Results

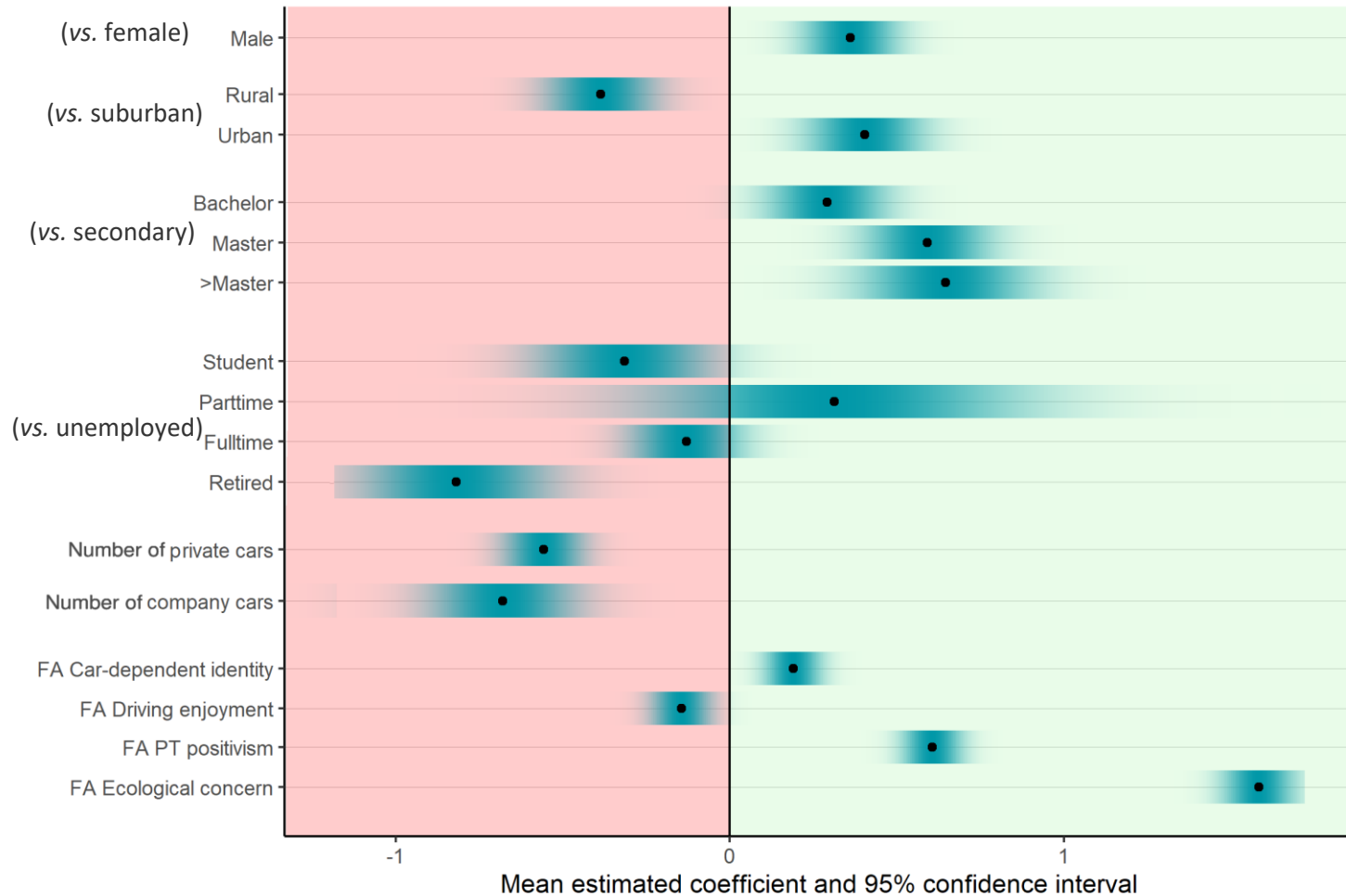
- A. Exploratory data analysis
- B. Modelling the willingness to share cars**
- C. Willingness to pay for shared cars
- D. Environmental analysis



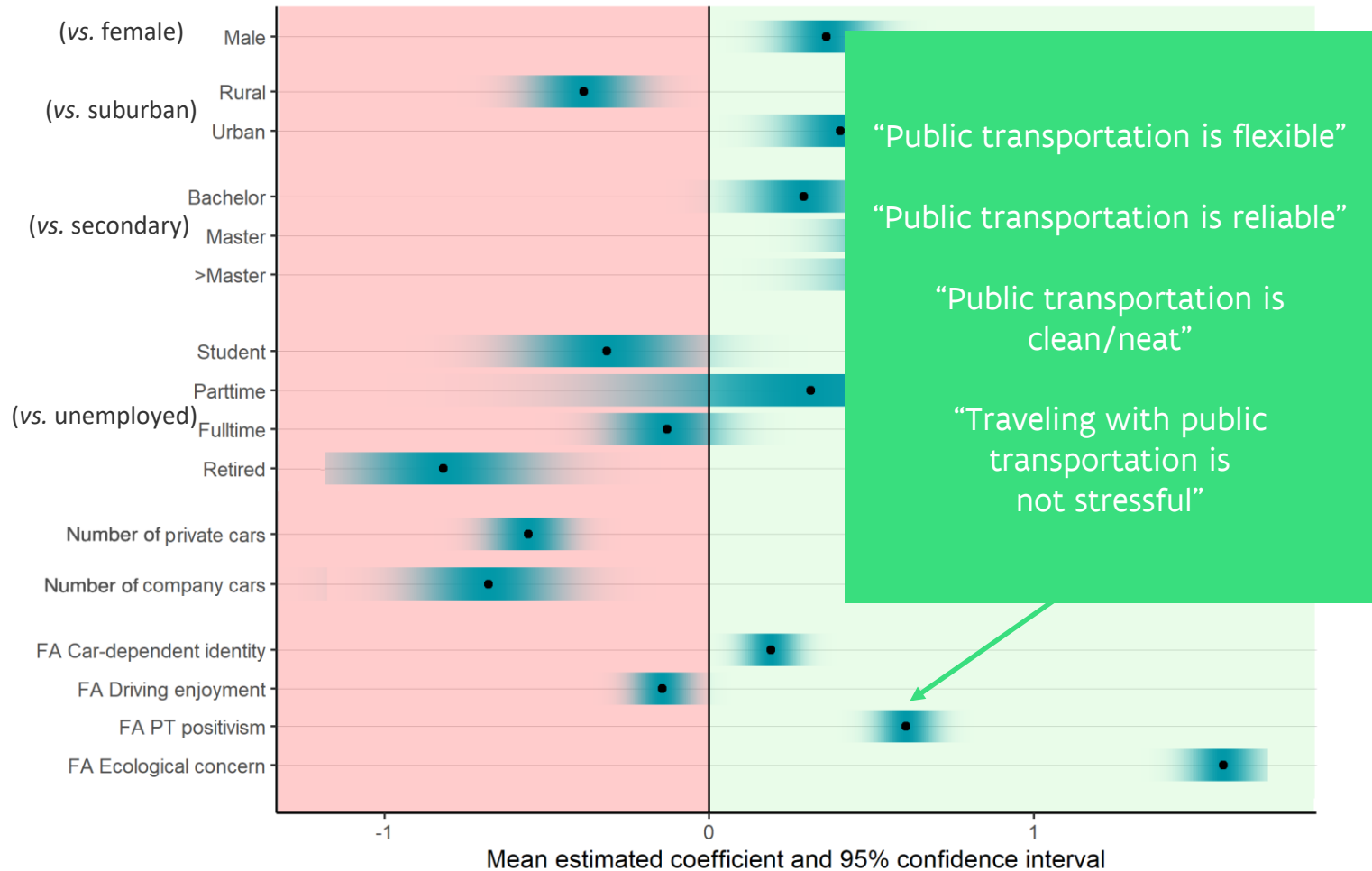
# Car-sharing intention

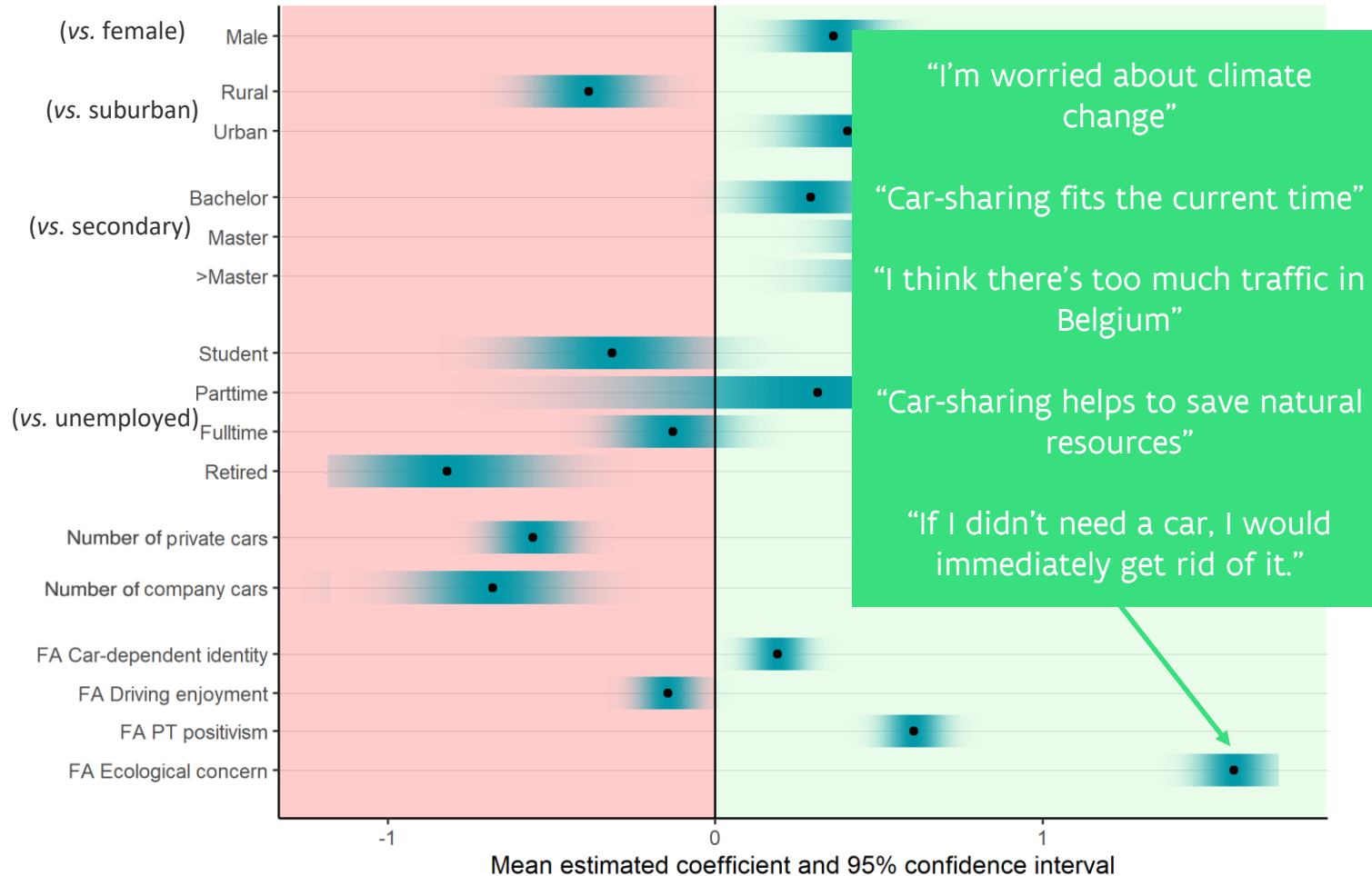
Would you ever consider to start sharing cars?











## 2. Results

- A. Exploratory data analysis
- B. Modelling the willingness to share cars
- C. Willingness to pay for shared cars**
- D. Environmental analysis



# Willingness to pay for shared cars

What are people looking for in a car-sharing system?

Which features do people value the most?

Ask respondents to state their preference over hypothetical alternative scenarios, goods or services in a **choice experiment**.

Each respondent makes eight choices



## Choice experiment for non-sharers

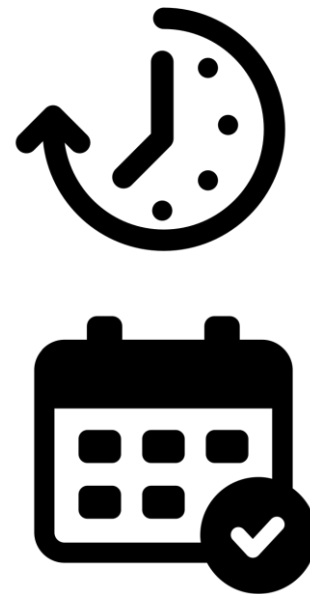
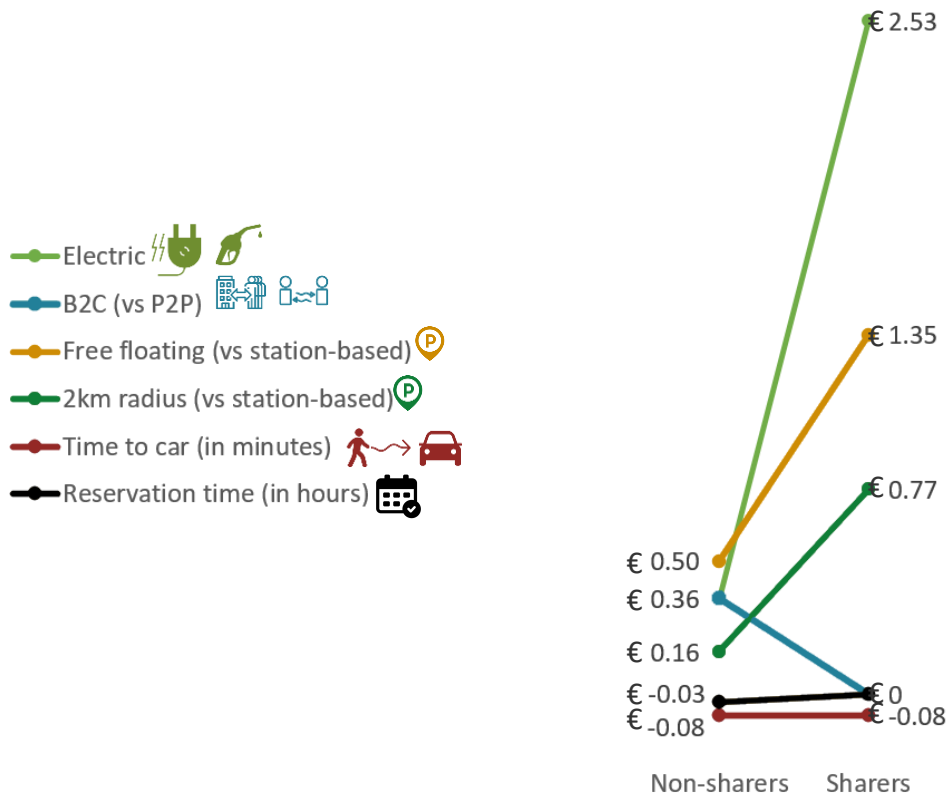
Suppose you (and your family) are in need of a new car. We will ask you to choose between two possibilities to expand your mobility options. If neither option is attractive to you, you can also indicate this.

Buy a car	Join a car-sharing system
your favorite model and favorite brand Fuel= Diesel purchasing cost of €12.000 Cost per kilometer of €0.15	P2P system Several models, including electric cars Monthly membership cost of €25 Cost per kilometer of €0.6 Free-floating system Car is 5 minutes away from your home Reserve 1-3 hours in advance

- ☒ Buy a car
- ☐ Join a car-sharing system
- ☐ Neither



# Willingness to pay (€ per kilometer)



Reference private car: €0.21 - €0.80 / kilometer (autogids.be)





# Summary – Results part 1

- A consumer survey with over 2.000 respondents
- Car-sharing intention is higher for:
  - males
  - not retired
  - higher education
  - urban areas
  - underlying factors such as ecological concern are important
- Car sharers and non-sharers have a **positive WTP for electric cars**
- Car sharers care less about **reservation times** or **B2C** sharing systems

## 2. Results

- A. Exploratory data analysis
- B. Modelling the willingness to share cars
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# What causes the impact of CS?

## Behavioural change

Car use

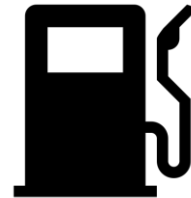


PT & bike  
use



## Technical change

Fuel type and  
efficiency

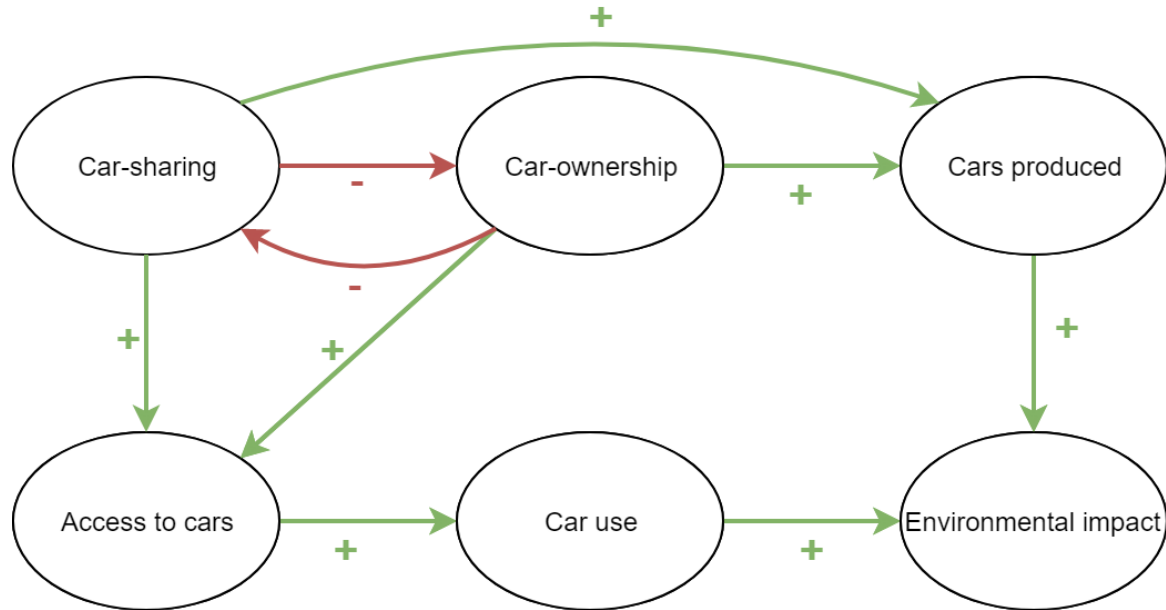


Lifetime  
(km)

1	8	2	6	4	8
					9



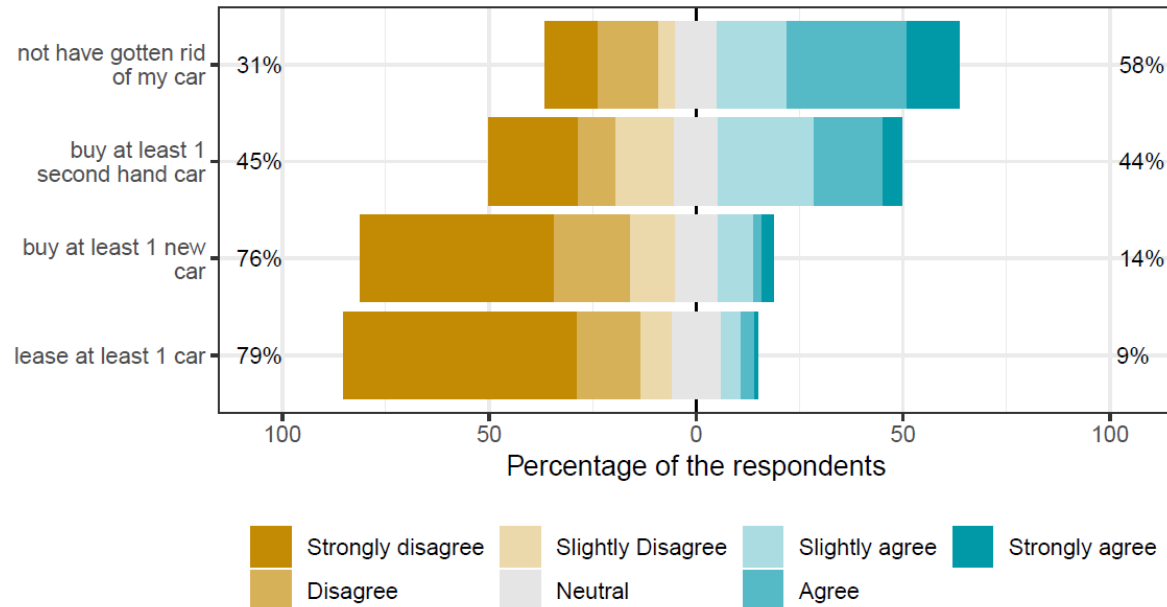
# Behavioural changes and Environmental Impact








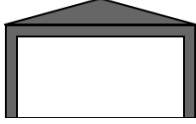
# Effect on car ownership

“If I wasn’t a member of car-sharing, I would ...”





# Effect on car ownership

	Own a car	Do not own a car
Sold/scrapped/ car not bought	<p>WACO</p> 	<p>WCO</p> 
No effect	<p>CON</p> 	<p>NCO</p> 

WACO = Would-be additional car-owner

WCO = Would-be car-owner

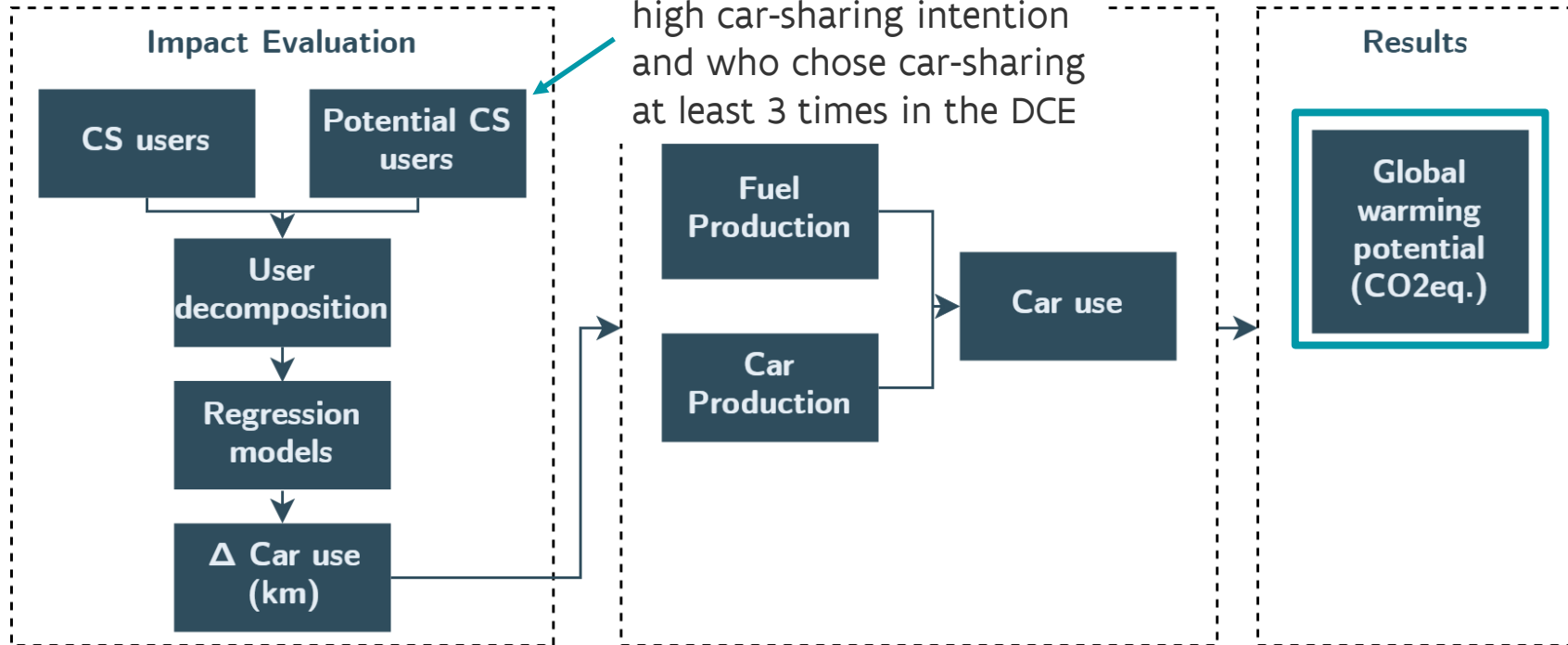
CON = Car-owner

NCO = Non-car-owner





# Two-step process to calculate impact



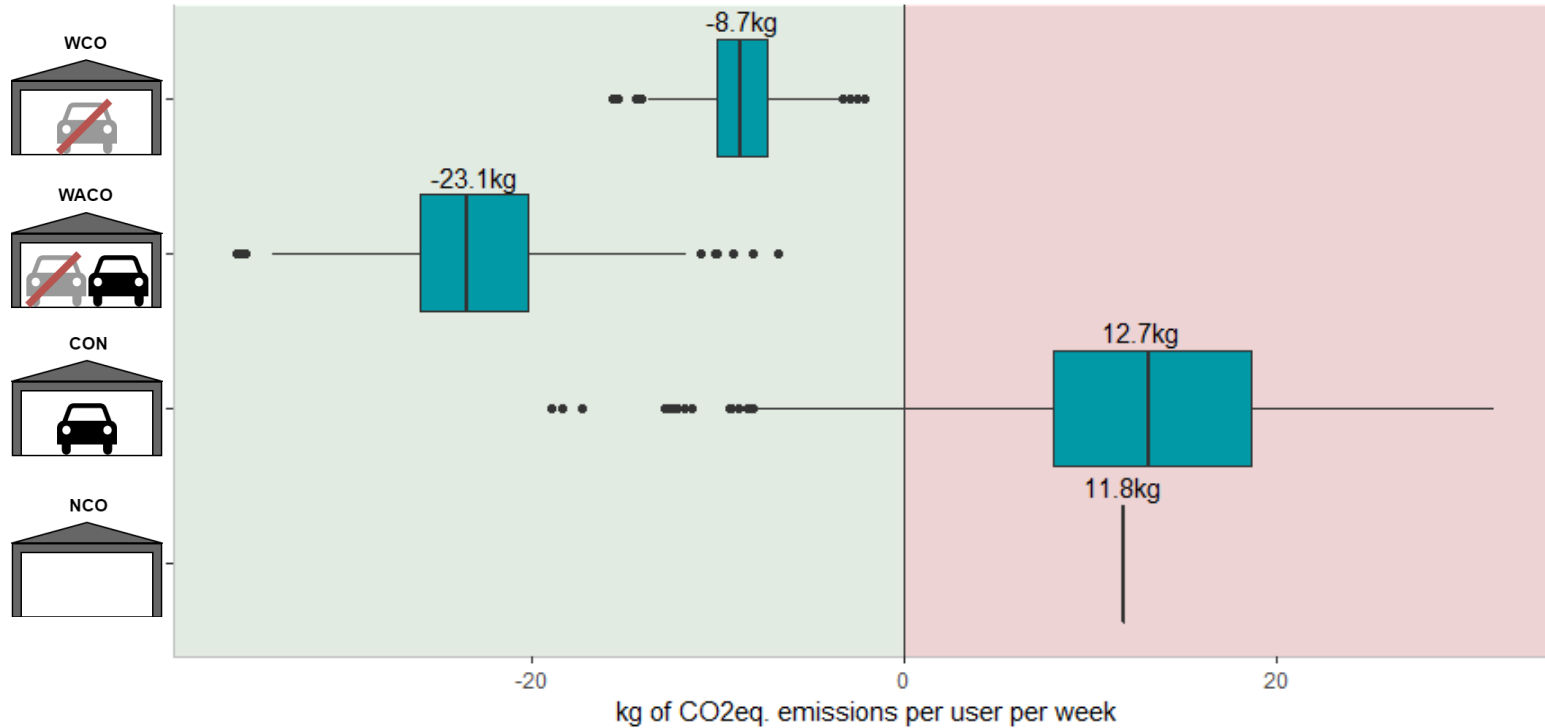


# Environmental impact – Assumptions

- System boundaries
  - Car production
  - Fuel production
  - Direct emissions from car use
- Same fuel efficiency and lifetime for both shared cars and private cars



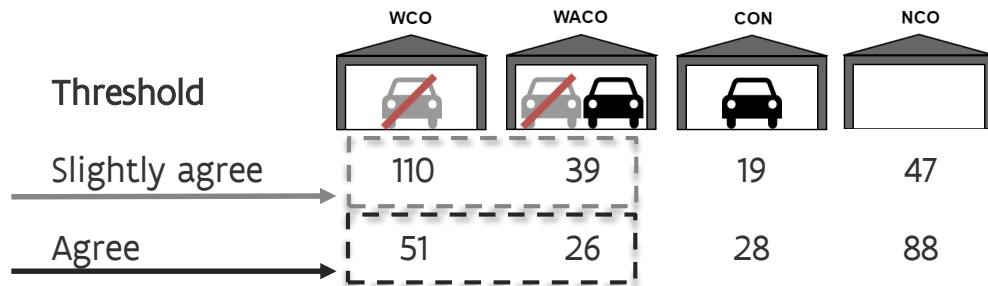
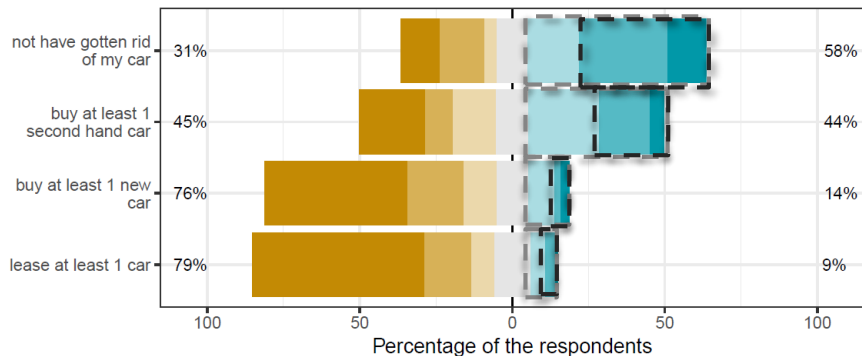
# Average user: “Good” vs. “bad”








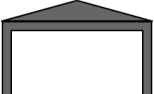
# Aggregate effects: Two scenarios

“If I wasn’t a member of car-sharing, I would ...”





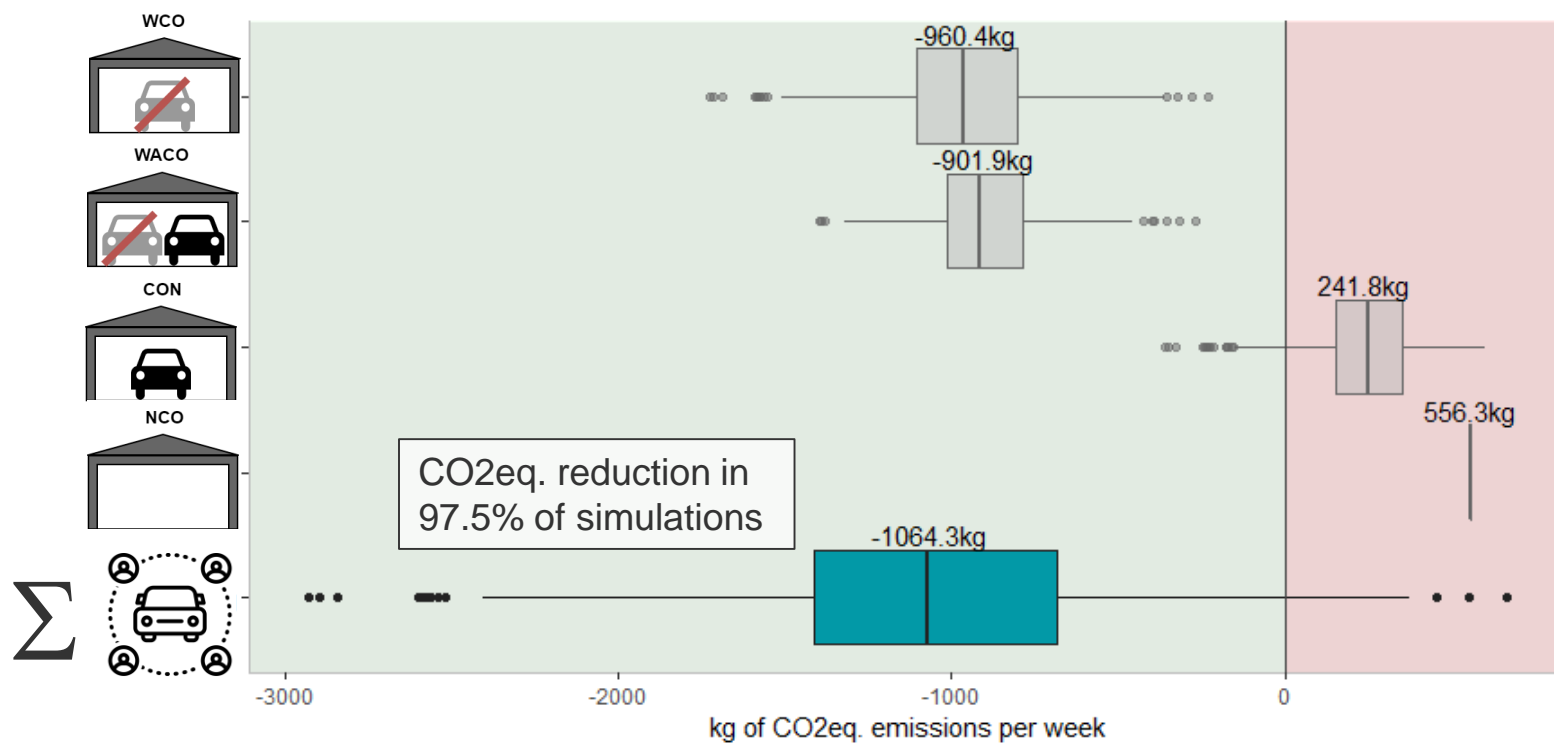
# Aggregate effects: Two scenarios

Scenario	Threshold	WCO	WACO	CON	NCO
					
Best-case	Slightly agree	110	39	19	47
Middle	Agree	51	26	28	88



# Car-sharing: beneficial ...

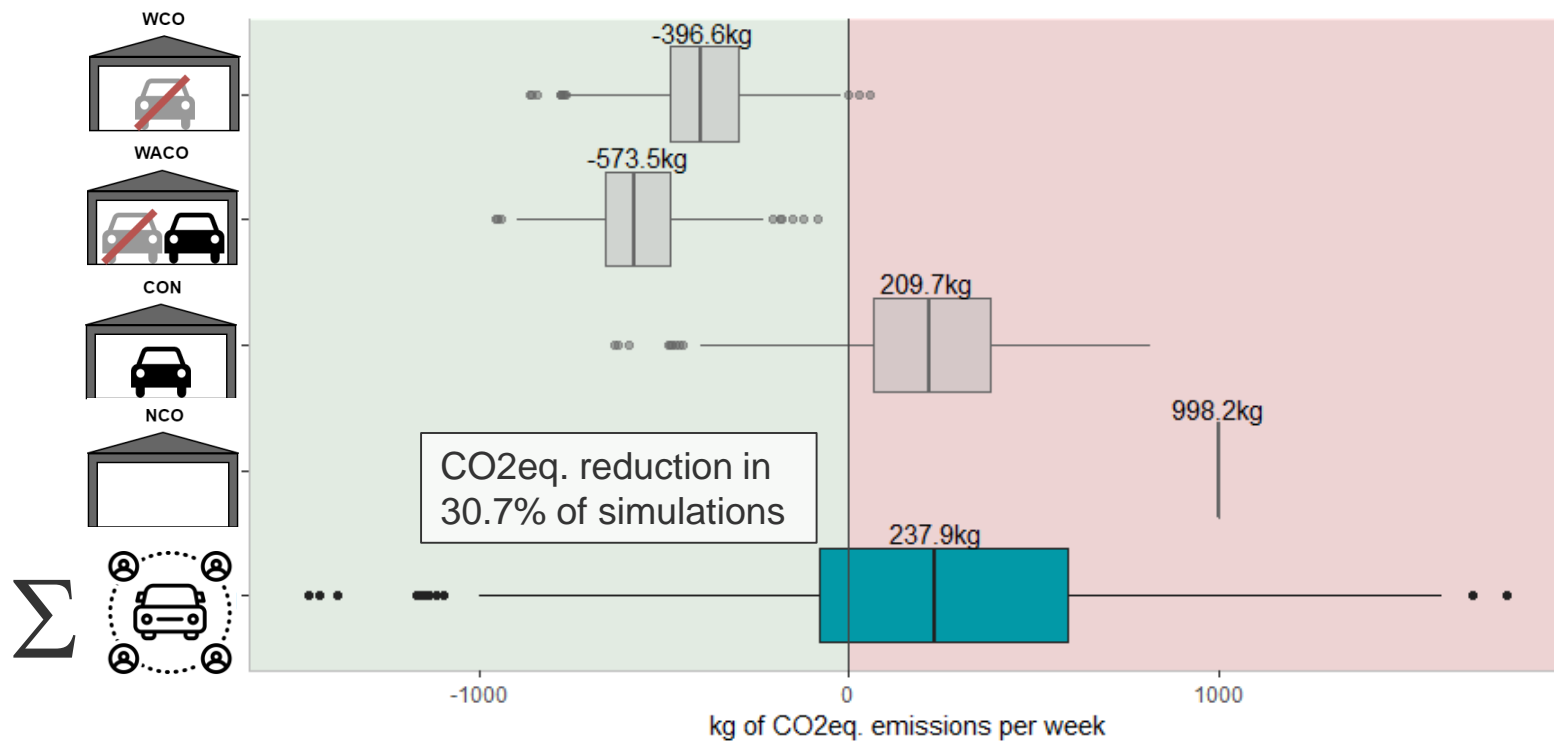
Aggregate effect: Best-case scenario





# Car-sharing: beneficial or not...

Aggregate effect: Middle scenario





## Summary – Results part 2

- Car-sharing reduces emissions for users who **sell/do not buy a car**
- Significant amount of users use car-sharing as an **additional mode** of transport
- Car-sharing may **reduce** or **increase** GHG emissions at the aggregate level



# 3. Policy implications

- A. General principle
- B. Subsidies
- C. Parking
- D. Public transport and cycling
- E. Electrification
- F. Regulatory and other barriers



# Car-sharing is a transition mechanism

- Policies should primarily **discourage car-ownership**
- Encourage more **sustainable alternatives** (public transport, cycling)
- Car-sharing can help **transition** people away from **car-use** and towards a **multi-modal** lifestyle





## Car-sharing doesn't need to be subsidised

- For prospective users, cost was **the least important barrier** – only 12% thought car-sharing was too expensive
- 91% of users joined because **it is already cheaper** compared to ownership
- Making car-sharing cheaper will **encourage car-use**





## Car parking spaces

- 40% of respondents would be more willing to join car-sharing **if parking was easier** for shared cars
- Parking spaces should only **replace existing spaces** for private cars





# Cycling and Public transport

- Risk that **public transport is replaced** by car-sharing for some users & some journeys:
  - 70% of car-sharing users joined because it is faster than public transport
- Cycling infrastructure and public transport should **continue to be improved**
- Through car-sharing, road (parking) **space can be saved** and used to improve cycling infrastructure





# Electrification

- Prospective and existing car-sharing users are willing to **pay more** for electric vehicles
- 94% of car-sharing users joined because they think it is **good for the environment**
- Help to **change cultural norms** that resist electric vehicles





# Regulatory changes

- Having a **company car** was a major reason for low car-sharing intention
- Include **open data clauses** to capture **better data** from car-sharing firms to help track progress
  - Regular survey of users to track their behaviour



# Acknowledgements



- Funding by the Flemish administration (OVAM and EWl)
- The 2.000+ respondents of the survey and the interviewees
- Policy officers from the Flemish administration for their feedback
- You, for your kind attention



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## Questions?



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