




# Do our basic values guide us in our transportation mode choice?

## An evidence from a Swiss tracking study

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# Do our basic values guide us in our transportation mode choice? An evidence from a Swiss tracking study

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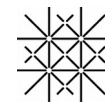
<sup>3</sup>University of Basel, Faculty of Business and Economics

<sup>4</sup>ETH Zurich, Institute for Transport Planning and Systems (IVT)

Swiss Mobility Conference, Lausanne, 30<sup>th</sup> October 2020

**ETH**

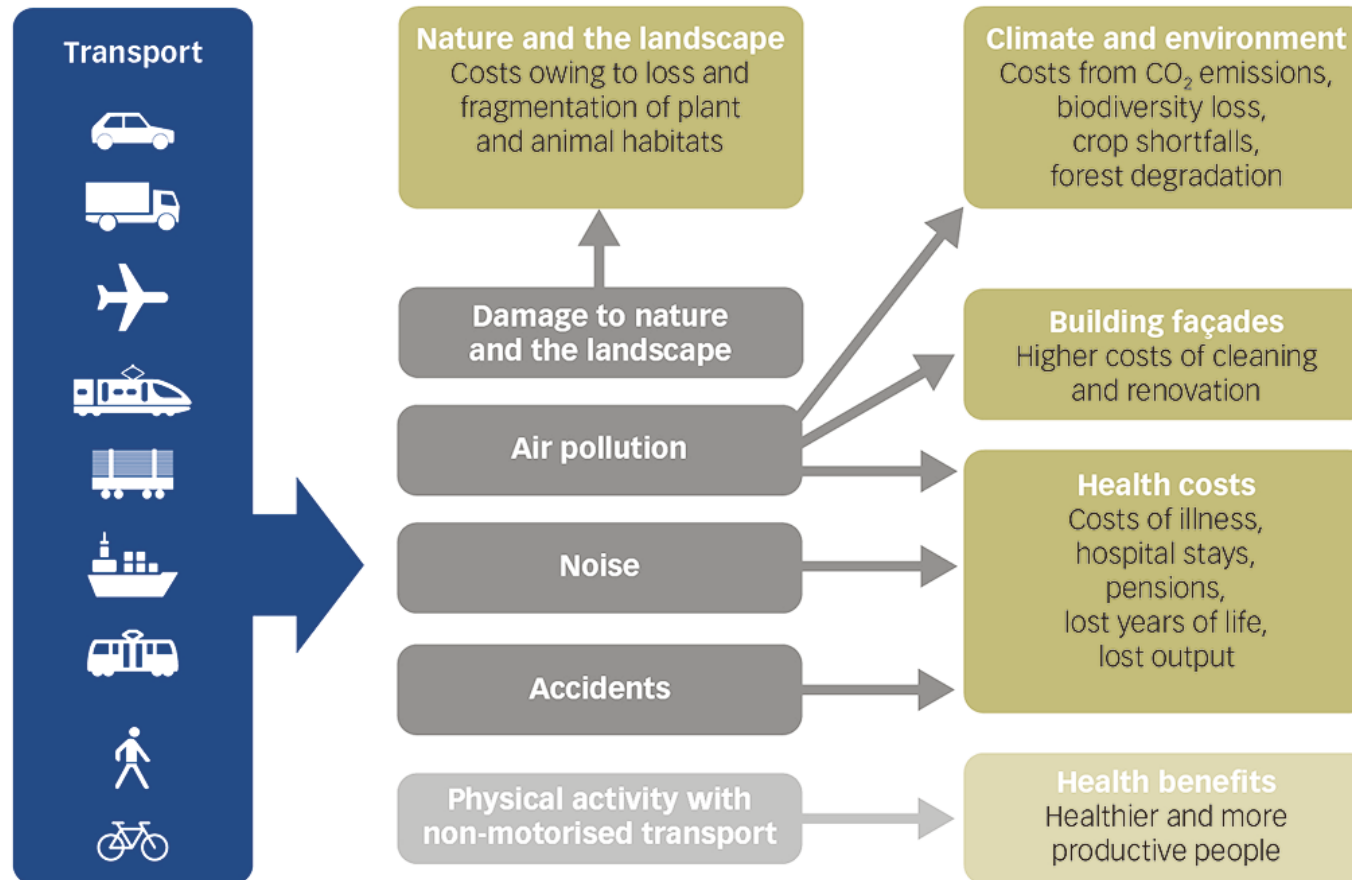
Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich



Universität  
Basel

# Impacts of traffic

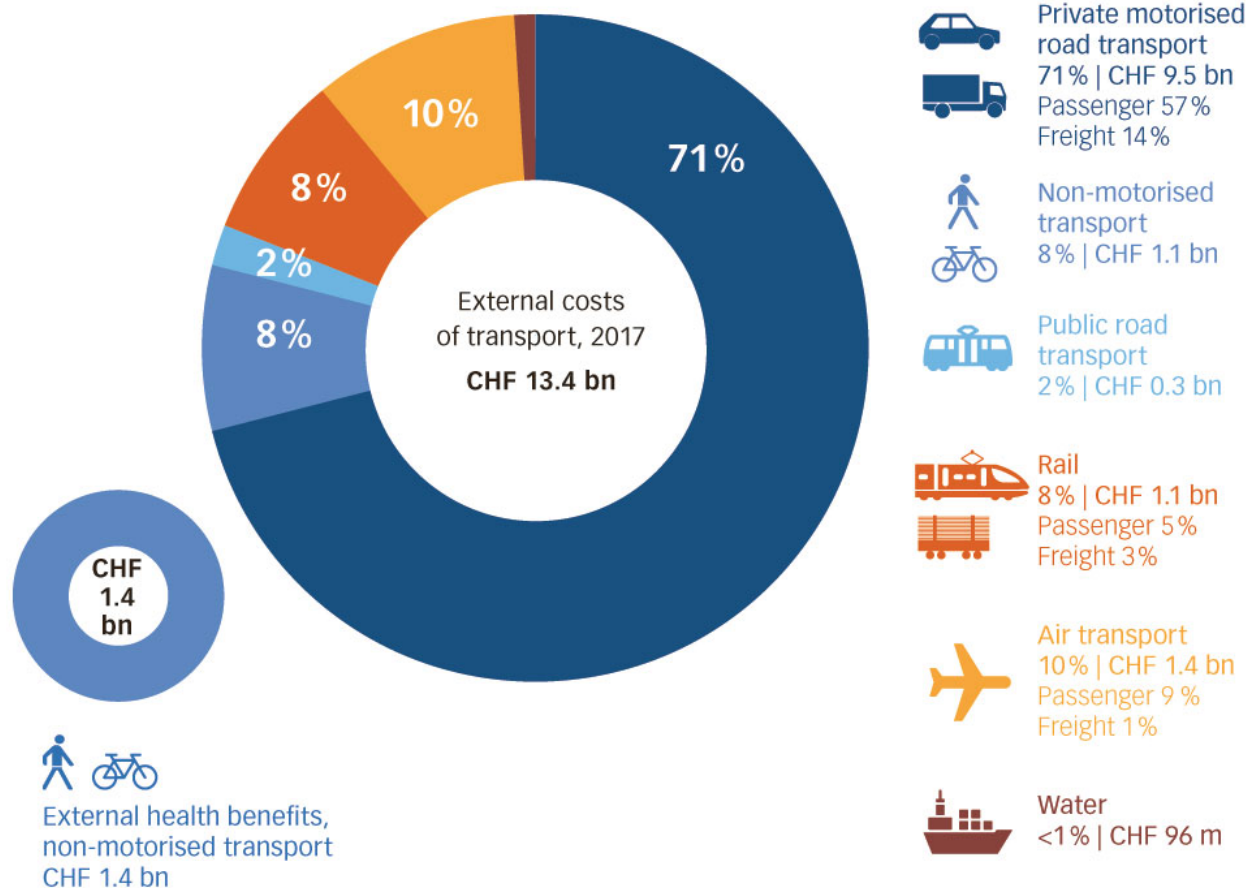
## Impacts of transport on the environment and health



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# Large share of negative impacts caused by car

Total external costs and benefits of transport, 2017

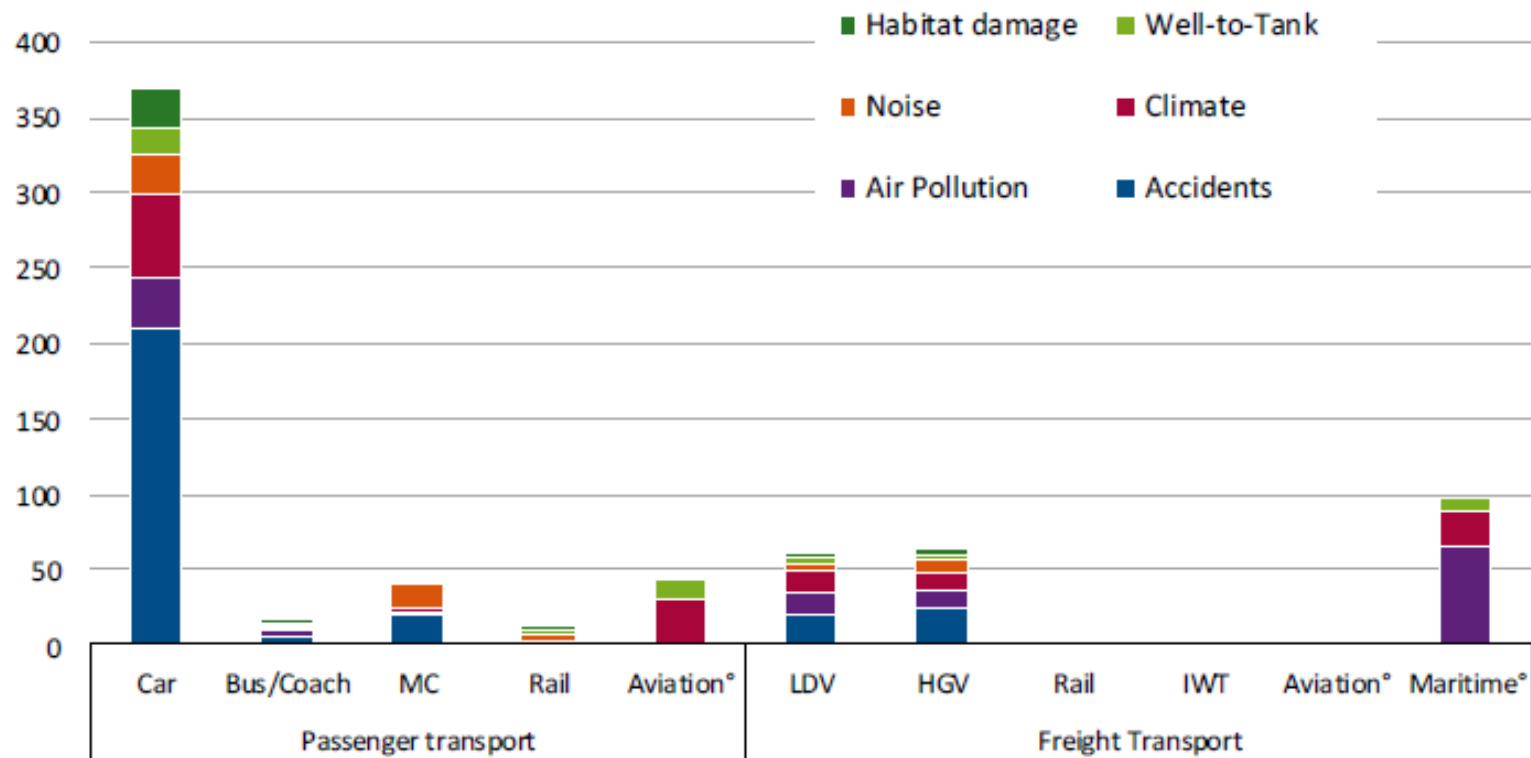


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# Large share of negative impacts caused by car

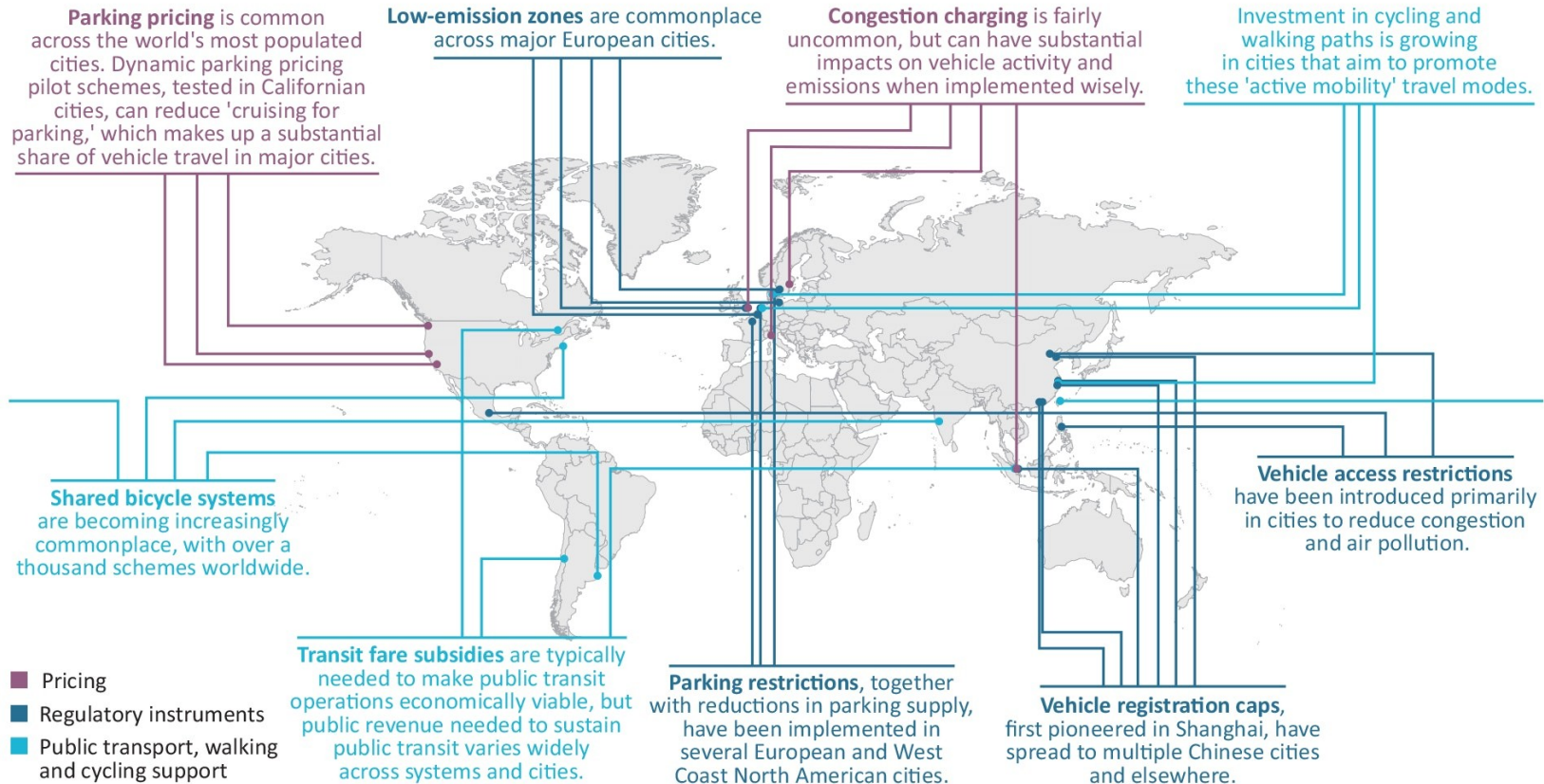
Figure 12 - Total external costs 2016 for EU28 (excluding congestion)

Billion € per year



\* Data for aviation and maritime: rough estimations for EU28.

# Measures undertaken

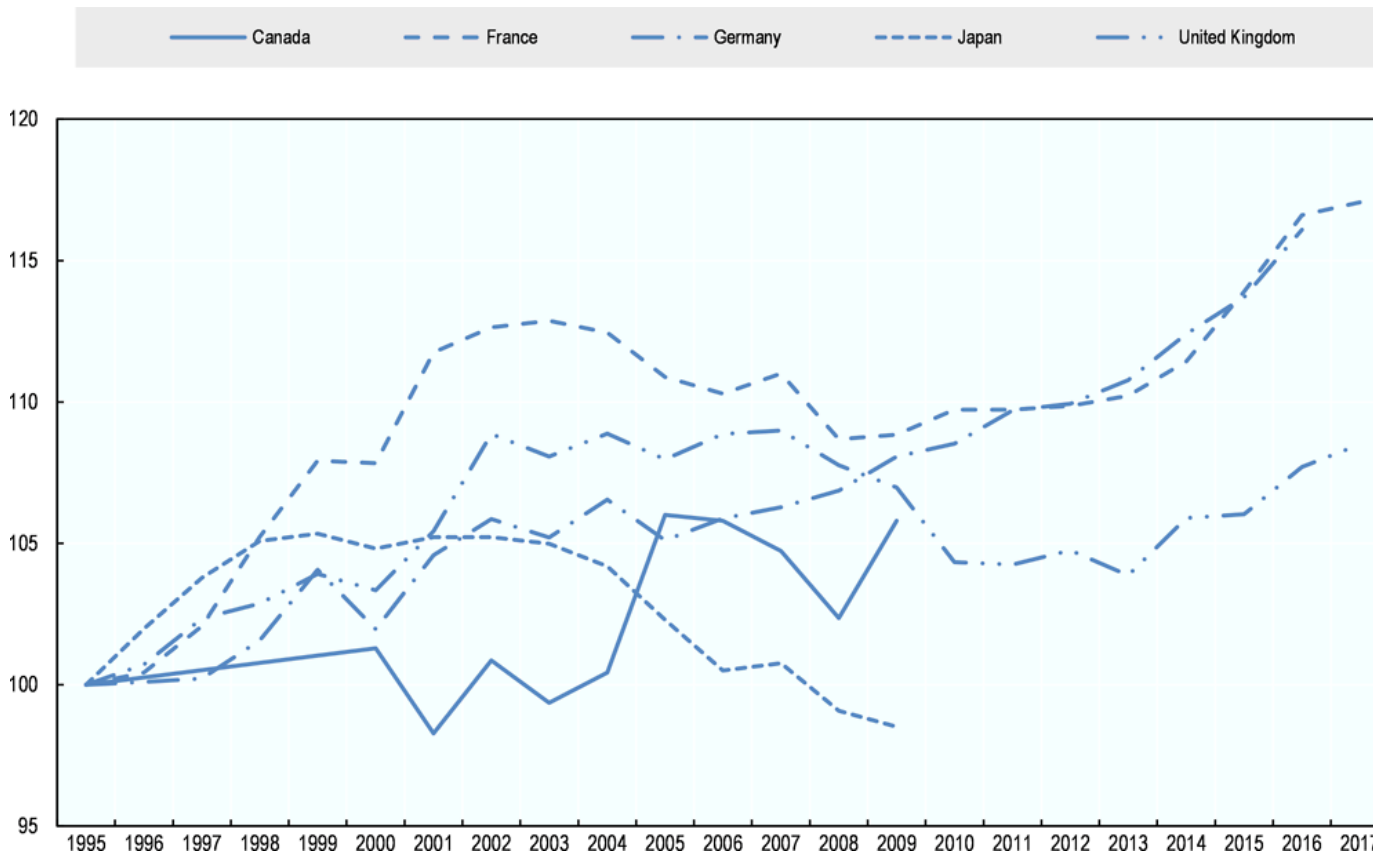


This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.

# However demand for private passenger road transport is still dominant and continues to rise...

## Travel by private car in selected countries, 1995-2017

Passenger-kilometres, 1995=100



# Determinants of modal choice

Transportation Research Part A 49 (2013) 329–341

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journal homepage: [www.elsevier.com/locate/tra](http://www.elsevier.com/locate/tra)



ELSEVIER



## Linking modal choice to motility: A comprehensive review

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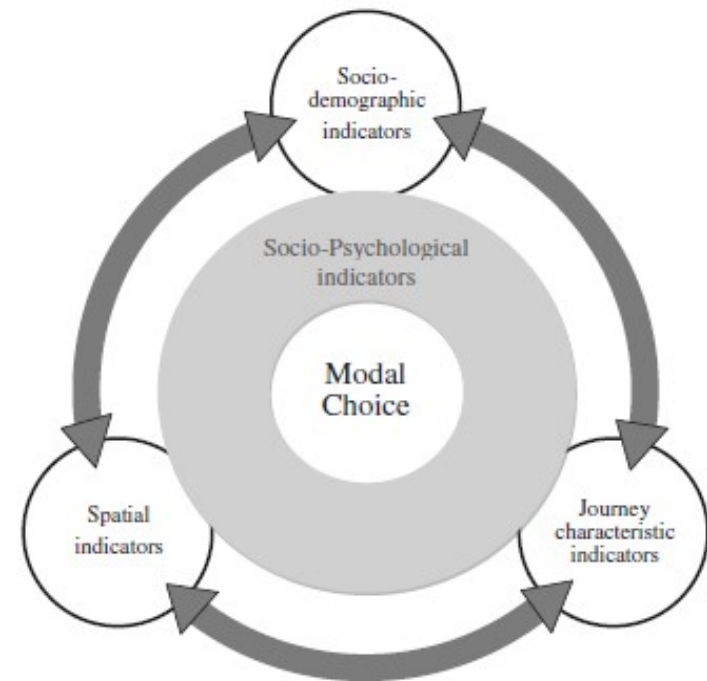
Determinants

Motility

### ABSTRACT

Modal choice is determined by a whole range of factors that are interrelated to a larger or smaller extent. It is often the result of a very compound choice process that can take place consciously or unconsciously and that includes objective as well as subjective determinants. Despite its significance in our daily life, there is no uniform way to define and analyze the concept of modal choice. The aim of this review is to fill this gap by elaborating a common modal choice definition and by providing a comprehensive review on the concept of modal choice through linking it to Kaufmann's motility concept. By doing so, this review will not only contribute to an improved knowledge on different modal choice determinants and their interdependencies, but can also assist to the understanding and modeling of modal choice decisions. The review can therefore help increasing the effectiveness of policy measures taken by environmental, urban and transport policy makers.

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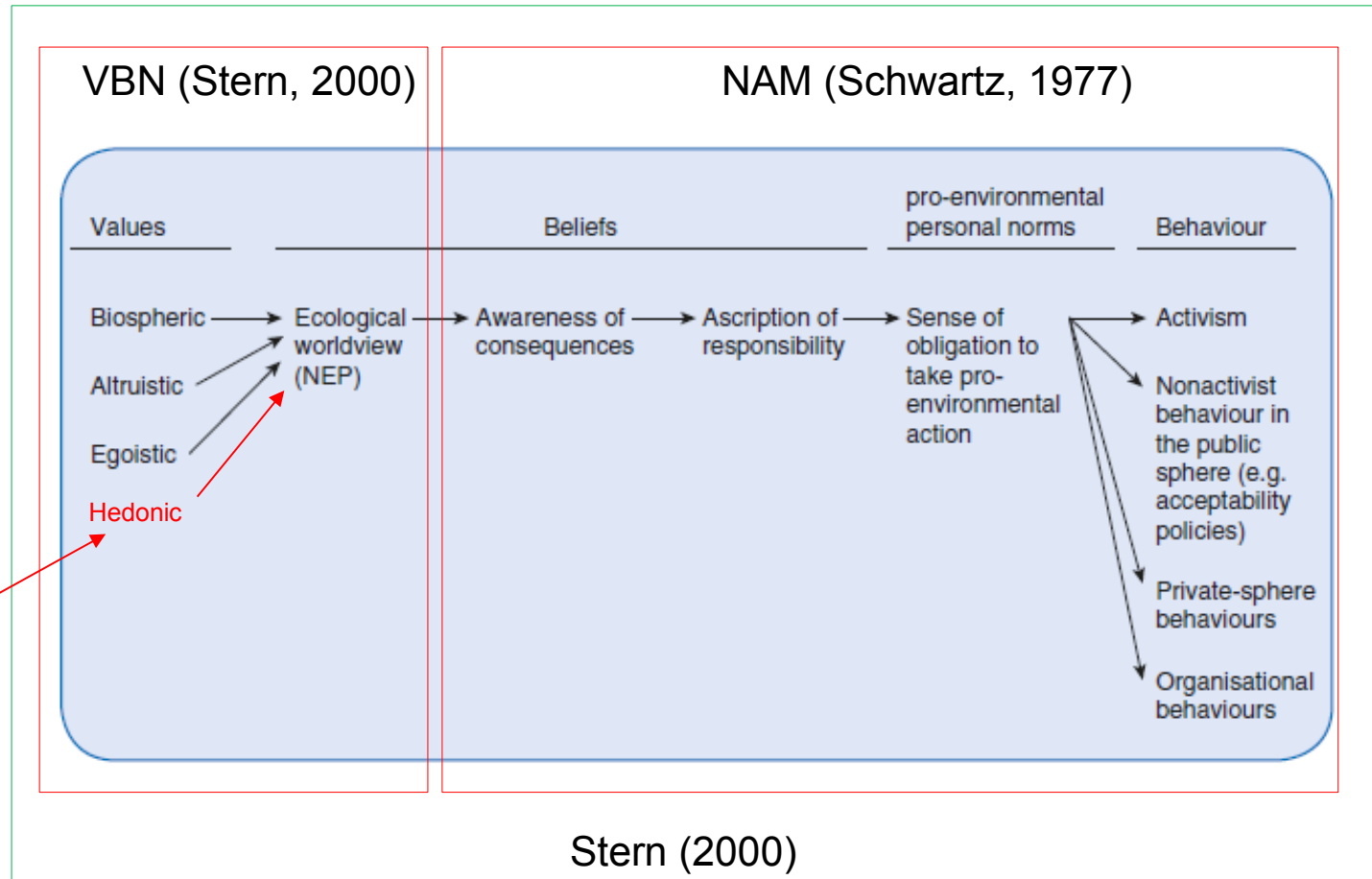
De Witte, A., Hollevoet, J., Dobruszkes, F., Hubert, M., & Macharis, C. (2013). Linking modal choice to motility: A comprehensive review. *Transportation Research Part A: Policy and Practice*, 49, 329–341.



# Values and behaviour

Value: “a desirable transsituational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity” (Stern, 2000, p. 21)

Steg et al. (2014)



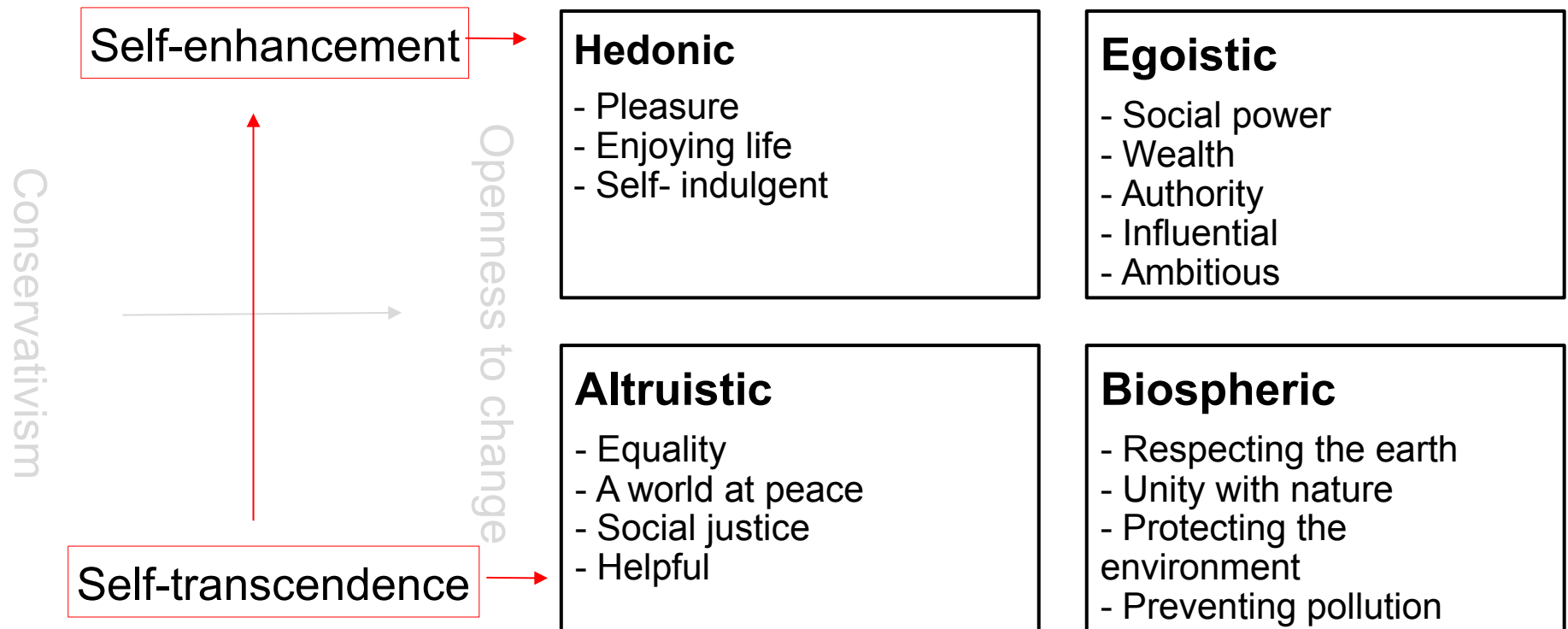
Schwartz, S. H. (1977). Normative influences on altruism. IN L. Berkowitz (Ed.), *Advances in experimental psychology*, vol. 10.

Steg, L., Perlaviciute, G., Van der Werff, E., & Lurvink, J. (2014). The significance of hedonic values for environmentally relevant attitudes, preferences, and actions. *Environment and behavior*, 46(2), 163-192.

Stern, P. C. (2000). New environmental theories: toward a coherent theory of environmentally significant behavior. *Journal of social issues*, 56(3), 407-424.

# Values: measurement

Schwartz Value Survey (Schwartz, 1992) shortened and adapted by De Groot & Steg et al. (2008) and Steg et al. (2014)



Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in experimental social psychology*, 25(1), 1-65.

De Groot, J. I. M., & Steg, L. (2010). Relationships between value orientations, self-determined motivational types and pro-environmental behavioural intentions. *Journal of Environmental Psychology*, 30, 368-378.

Steg, L., Perlaviciute, G., Van der Werff, E., & Lurvink, J. (2014). The significance of hedonic values for environmentally relevant attitudes, preferences, and actions. *Environment and behavior*, 46(2), 163-192.

# Research gap

Transportation (2014) 41:873–888  
DOI 10.1007/s11116-013-9504-3

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Editor: Filip N. Gustavsson, pp. -

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## Values, attitudes and travel behavior: a hierarchical latent variable mixed logit model of travel mode choice

Marcel Paulssen · Dirk Temme · Akshay Vij · Joan L. Walker

Article

### The Significance of Hedonic Values for Environmentally Relevant Attitudes, Preferences, and Actions

Linda Steg<sup>1</sup>, Goda Perlaviciute<sup>1</sup>,  
Ellen van der Werff<sup>1</sup>, and Judith Lurvink<sup>1</sup>

Environment and Behavior  
2014, Vol 46(2) 163–192  
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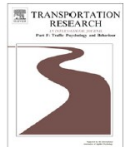



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### Transportation Research Part F

journal homepage: [www.elsevier.com/locate/trf](http://www.elsevier.com/locate/trf)



Sustainable transportation in Argentina: Values, beliefs, norms and car use reduction



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<sup>a</sup> Instituto de Investigación en Luz, Ambiente y Visión, CONICET-UNT, AV. Independencia 1800, CP 4000 San Miguel de Tucumán, Tucumán, Argentina

<sup>b</sup> Faculty of Behavioural and Social Sciences, Department of Psychology, University of Groningen, Grote Kruisstraat 2/1, 9712 TS Groningen, Netherlands

- ⇒ Studies are based either on survey or on modelling data
- ⇒ No studies analyse observed behaviour captured e.g. through tracking


# Research question



What is the effect of hedonic, egoistic, altruistic and biospheric values on the use of different transportation modes?

# MOBIS project (September 2019 – January 2020)

## Control group



Report | Week 5  
26.10.2019 - 01.11.2019









Dear Alain Elchoueiri

Thank you for participating in the MOBIS study. This week was the 5th week of the study.

Your participation this week: 7 active days and 0 inactive days

Your use of different travel modes is displayed below. Note that the values may differ slightly from those displayed in the app.

Distance by transport mode

 0 km **	 10 km	 7 km	 75 km	 0 km
				

● Increase/decrease in travel distance since last week  
\*\* Includes all local public transport: Bus, Tram, Metro & S-Bahn

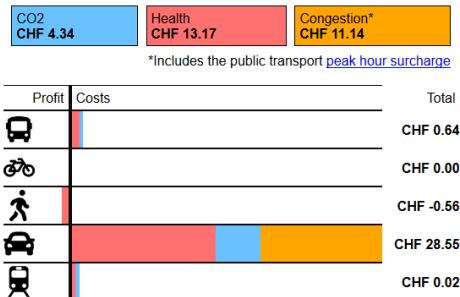
To ensure the accuracy of the MOBIS study results, we would appreciate you validating your tracks regularly. You will find more information on how to validate your tracks [here](#).

For further information about the study, please visit the [MOBIS study website](#).

Alternatively contact the study team by sending an email to [mobis@ethz.ch](mailto:mobis@ethz.ch).

## Information group

Your external costs for the last week



What do these charts show me?

Each of us, when we travel, generates costs. Some of these costs are paid for by ourselves and are therefore called "internal". Examples include maintaining a car, purchasing fuel, paying for a train ticket and the value of our own time spent traveling.

However, we also impose costs on others in the form of changes to the environment, public health and congestion (a time loss to other drivers). These costs are called "external" because they are not borne by ourselves but by society as a whole.

The figures above illustrate the external costs that you imposed on others last week.

For further information about the study, please visit the [MOBIS study website](#).

## Pricing group

Remaining Budget on 01.11

CHF 91.33

This is an estimate based on your most recent available data. CHF 4.64 was deducted from your budget per inactive day and per day abroad.



Control group

1. month: observation phase

Control group

Information group

Pricing group

2. month: intervention phase



- 18-65 years old (at the end of 2018)
- Regular use of a car (at least two days a week)
- Live in a metropolitan area in the German- or French-speaking part of Switzerland
- Use of a smartphone that can install the tracking app
- Be able to walk 200m without pain or any other discomfort
- You must not work as a professional driver

# Data: tracking



## Catch My Day

MotionTag GmbH Maps & Navigation

PEGI 3

You don't have any devices.

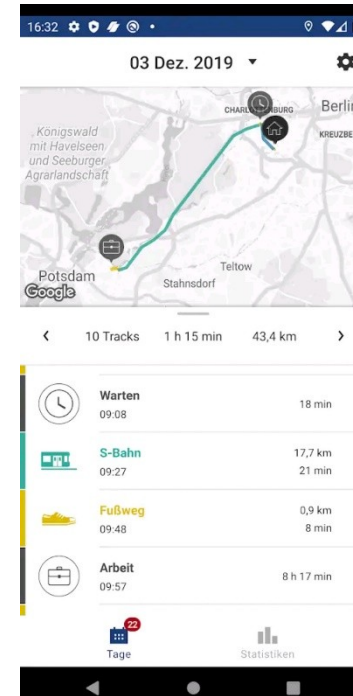
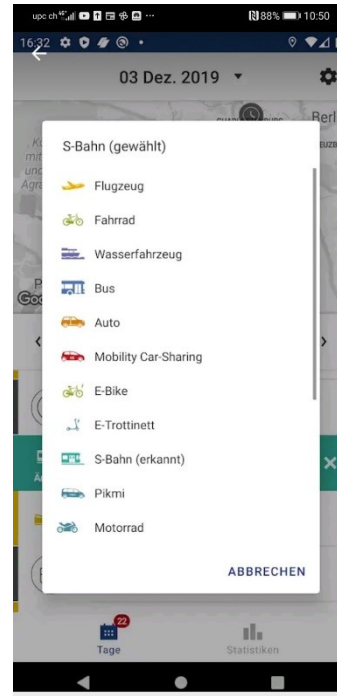
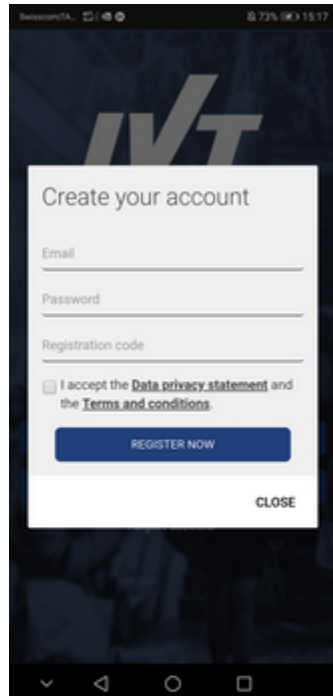
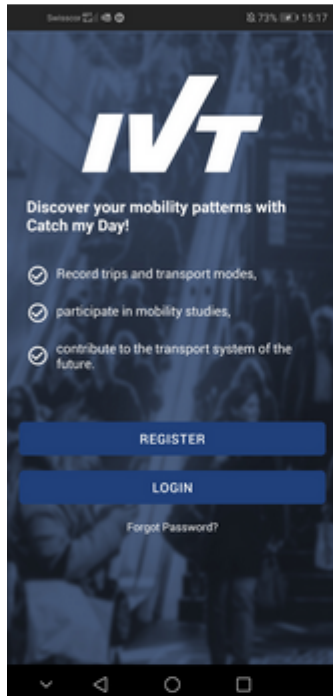
Add to wishlist

★★★★★ 29

Install

### Per trip:

- Distance
- Time
- Transportation mode



# Data: surveys

## – Introductory survey

- Socio-demographics
- Work-related
- Endowment with vehicles and public transport subscriptions
- Frequency of use of transportation modes
- Attitudes towards transportation-related issues in Switzerland
- Interest to participate in the study
- Other inclusion criteria (smartphone, no professional driver, mobile person)

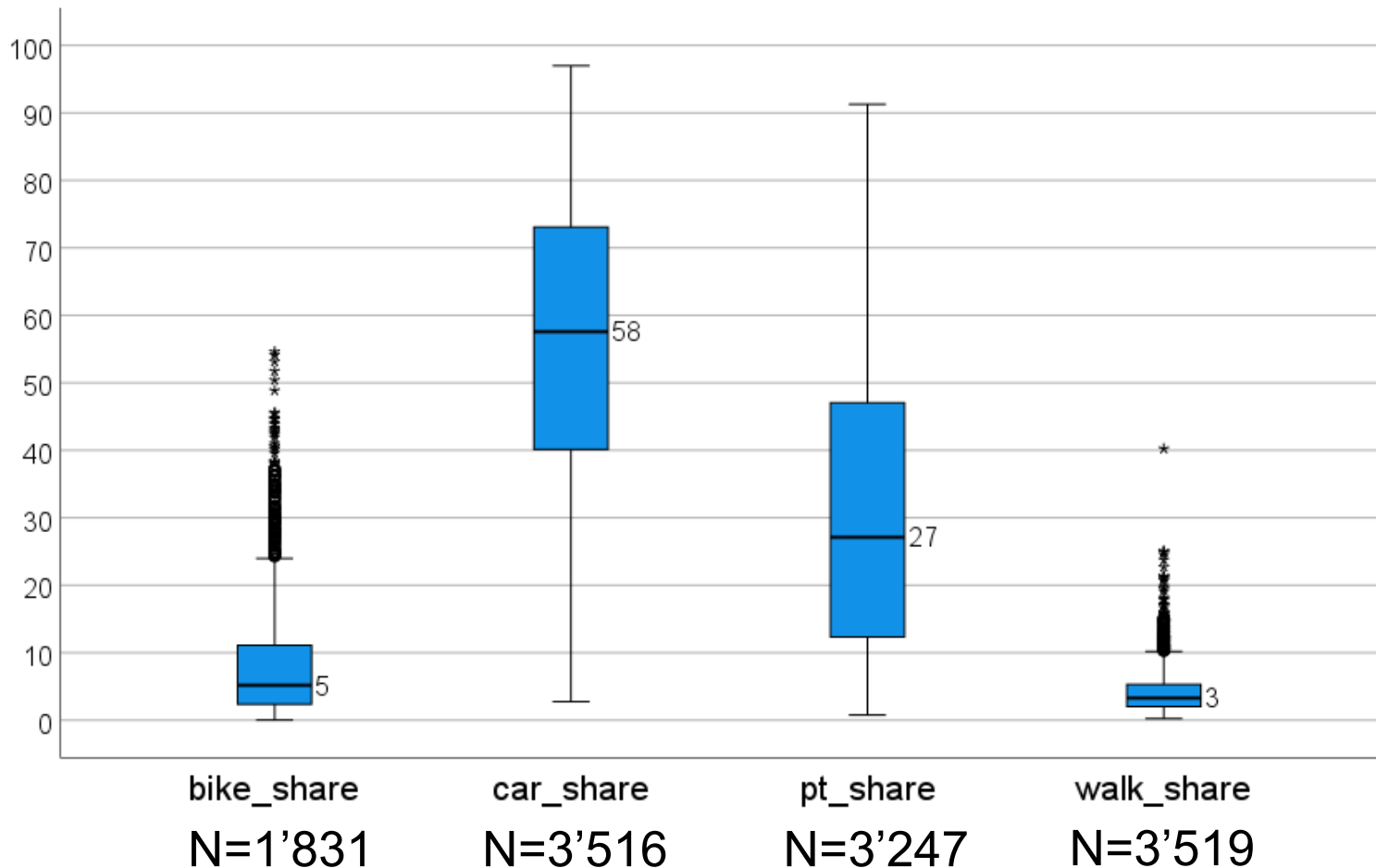
## – Final survey

- Absence during the study
- $\Delta$  Work-related
- $\Delta$  Attitudes towards transportation-related issues in Switzerland
- Car attitudes
- Intervention perception and understanding
- Stated preferences experiment
- Attitudes towards the use of mobility pricing revenue
- Lifestyles and values
- Health
- Payment issues

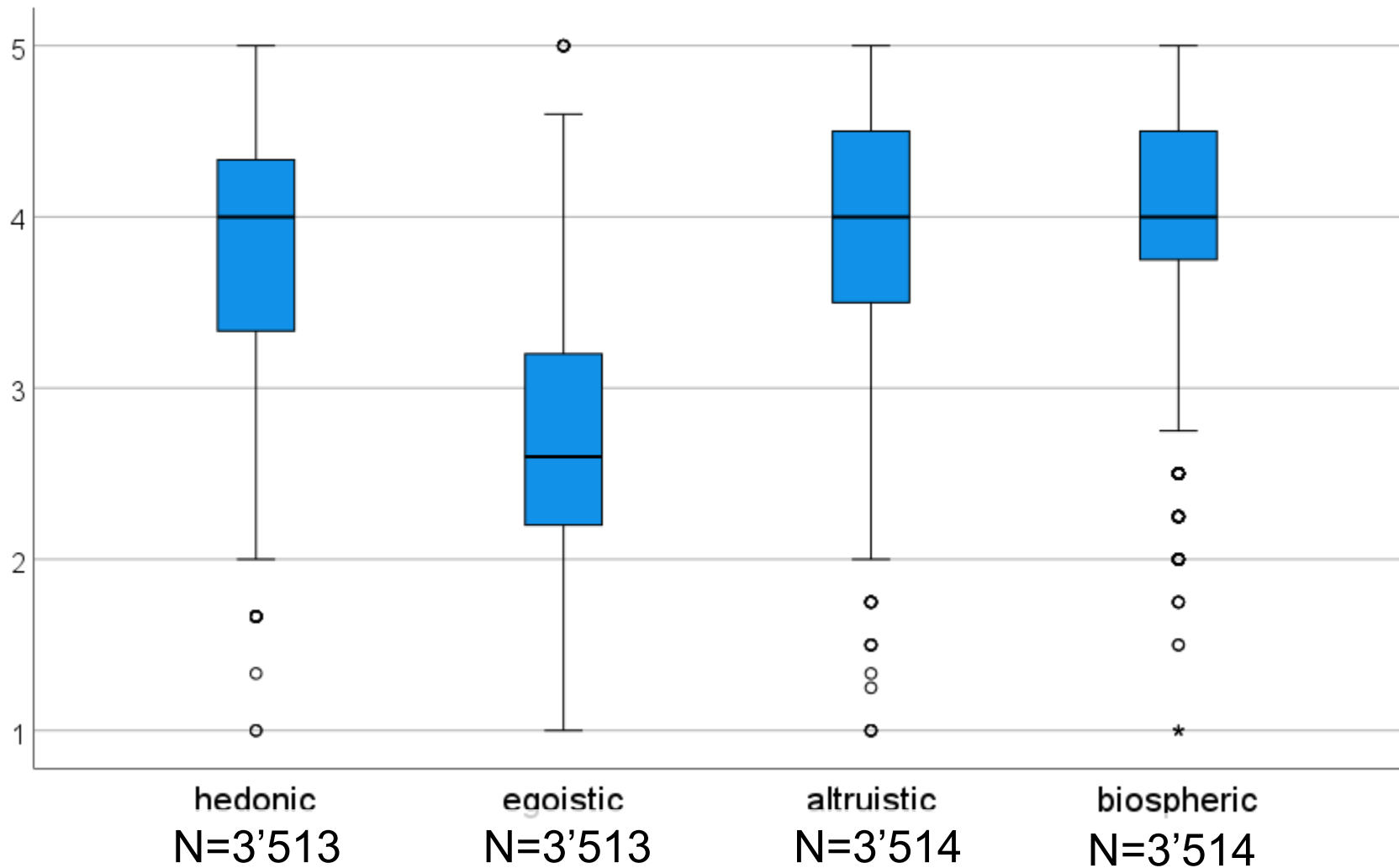


# Dependent variable

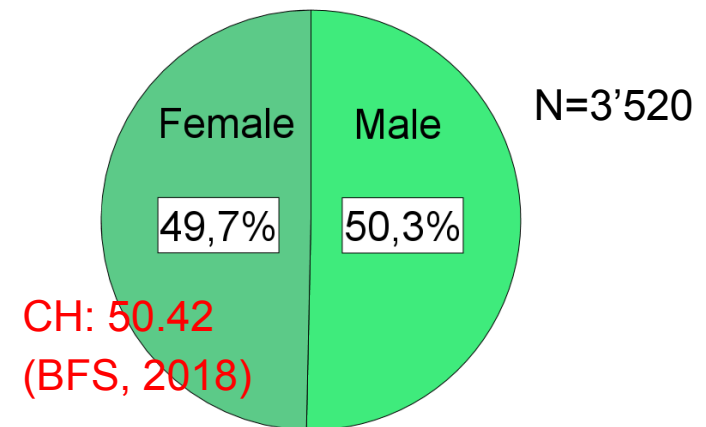
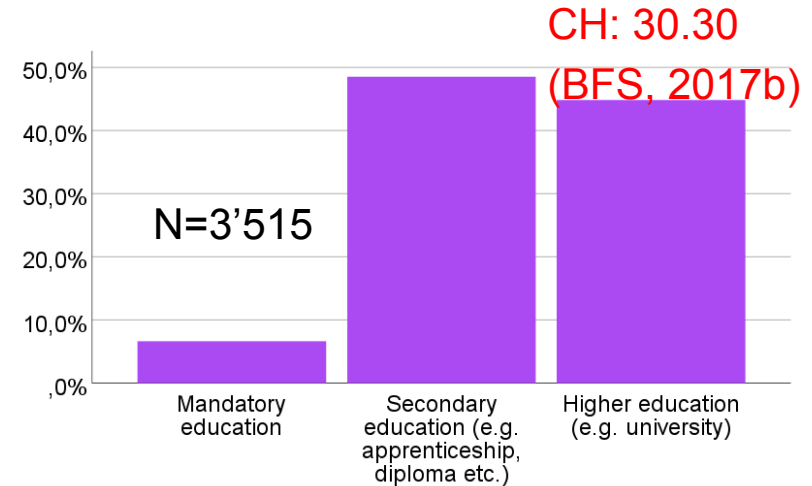
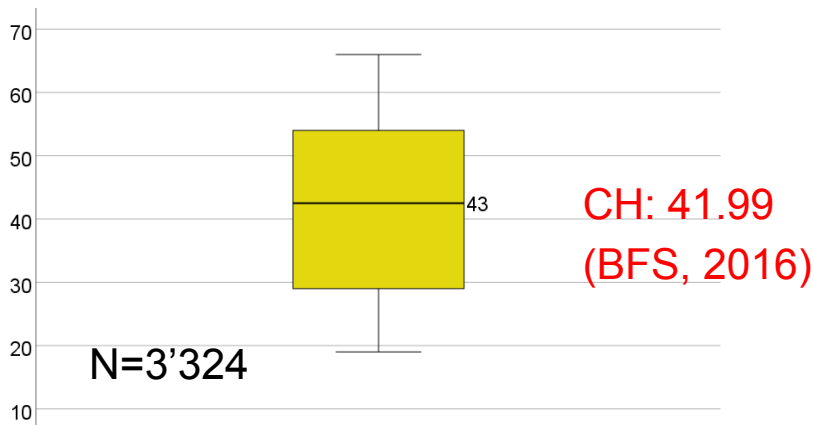
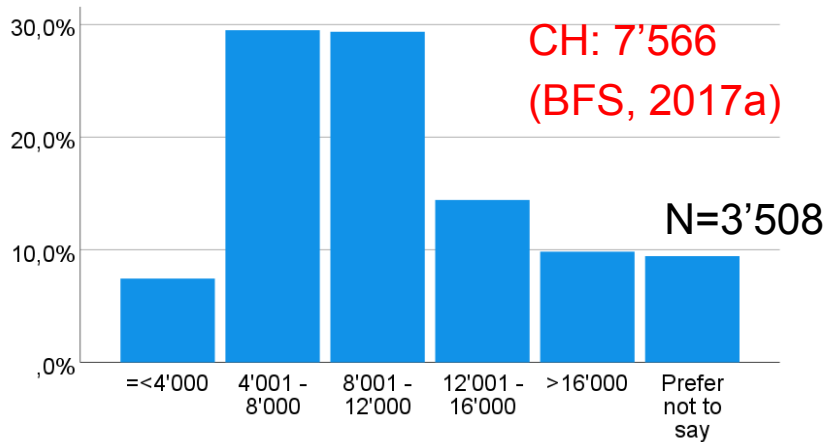
Share (%) of the total average daily distance in the observation phase covered by: Bike, Foot, Car, PT



# Independent variables: values



# Control variables: socio-demographics



- BFS (2016): <https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.291224.html>  
 BFS (2017a): <https://www.bfs.admin.ch/bfs/de/home/statistiken/wirtschaftliche-soziale-situation-bevoelkerung/einkommen-verbrauch-vermoegen/haushaltsbudget.assetdetail.3865767.html>  
 BFS (2017b): <https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.3922968.html>  
 BFS (2018): <https://www.bfs.admin.ch/bfs/de/home/statistiken/bevoelkerung.assetdetail.5886141.html>

# Results

	Bike share			Car share			PT share			Walk share	
	$\beta$	p		$\beta$	p		$\beta$	p		$\beta$	p
Hedonic	-.035	.185		<b>.048</b>	<b>.011</b>		-.021	.286		-.035	.064
Egoistic	-.021	.417		.021	.264		<b>-.039</b>	<b>.044</b>		<b>.042</b>	<b>.022</b>
Altruistic	-.022	.440		-.015	.461		.016	.445		.018	.373
Biospheric	<b>.055</b>	<b>.050</b>		<b>-.049</b>	<b>.014</b>		.008	.696		<b>.041</b>	<b>.041</b>
Income	-.017	.489		<b>-.053</b>	<b>.002</b>		<b>.058</b>	<b>.001</b>		.006	.751
Education	-.032	.188		<b>-.115</b>	<b>.000</b>		<b>.112</b>	<b>.000</b>		-.026	.137
Age	.022	.355		.031	.074		-.027	.137		-.003	.874
Sex	.022	.370		.016	.342		-.022	.212		-.020	.244
adj. R <sup>2</sup>	0.002			0.021			0.020			0.003	
F	1.418			9.869			7.753			2.095	
N	1'709			3'303			3'055			3'307	

# Discussion

- Jakovcevic & Steg (2013)
  - Altruistic values positively related to the intention to reduce car use following the implementation of a policy doubling the cost of car use (adj.  $R^2=.22$ )
- Paulssen et al. (2014)
  - No direct effect of values (hedonism, security, power) on mode choice. However, indirect effect of values on mode choice through their effect on attitudes towards mode choice (comfort and convenience, ownership, flexibility)
- Steg et al. (2014)
  - Values explained 6% of the variance in mileage. Stronger egoistic values were associated with a higher mileage ( $\beta = .19, p = .001$ ). Stronger hedonic values were associated with a higher mileage as well, although this relationship was marginally significant only ( $\beta = .12, p = .060$ ).
- De Groot et al. (2007)
  - Biospheric values significantly related to the intention to reduce car use ( $\beta = .19, p = .002, R^2=.16$ ).

De Groot, J. I., Steg, L., & Dicke, M. (2008). Transportation trends from a moral perspective: Value orientations, norms and reducing car use. *New transportation research progress*, 67-91.

Jakovcevic, A., & Steg, L. (2013). Sustainable transportation in Argentina: Values, beliefs, norms and car use reduction. *Transportation Research Part F: Traffic Psychology and Behaviour*, 20, 70-79.

Paulssen, M., Temme, D., Vij, A., & Walker, J. L. (2014). Values, attitudes and travel behavior: a hierarchical latent variable mixed logit model of travel mode choice. *Transportation*, 41(4), 873-888.

Steg, L., Perlaviciute, G., Van der Werff, E., & Lurvink, J. (2014). The significance of hedonic values for environmentally relevant attitudes, preferences, and actions. *Environment and behavior*, 46(2), 163-192.

# Policy implications and limitations

## – Policy implications

- Bike -> highlight positive environmental consequences of bike (activate biospheric values)
- Car -> highlight negative convenience and environmental consequences of car (activate hedonic and biospheric values)
- Public transport -> highlight positive financial consequences of public transport (highlight egoistic values)
- Walking -> highlight positive health/financial and environmental consequences of walking (activate egoistic and biospheric values)

## – Limitations

- No differentiation between commuting and leisure
- No differentiation between private car, car sharing and car pooling

# Policy implications: examples



<https://wrenmcdonald.com/>



<https://rtachicago.org/plans-programs/ride-marketing-campaign>



<https://rtachicago.org/plans-programs/ride-marketing-campaign>

# Thank you for your attention!

