technische universität
dortmund

Department of Transport Planning
Faculty of Spatial Planning

Mode choice changes and gendered key events in the life course

Joachim Scheiner

2nd Netherlands Mobility Panel (MPN) Symposium, Amsterdam, 12 September 2016

Background

Everyday life in the context of changing gender relations: activities, trips, travel modes and time use
(Alltag im Wandel des Geschlechterverhältnisses: Aktivitäten, Wege, Verkehrsmittel und Zeitverwendung)

(German Research Foundation, DFG, 2009-2016)

Mobility Biographies – A Life-Course Approach to Travel Behaviour and Residential Choice

(German Research Foundation, DFG, 2012-2017)

Key Events – Travel Behaviour Changes over the Life Course: The Role of Biographical and Accessibility-Related Key Events
(Key Events – Veränderungen der Mobilität im Lebenslauf:
Die Bedeutung biografischer und erreichbarkeitsbezogener Schlüsselereignisse)

(German Research Foundation, DFG, 2015-2018)

Theoretical background

Gender/travel research

Life course approaches to travel (mobility biographies)

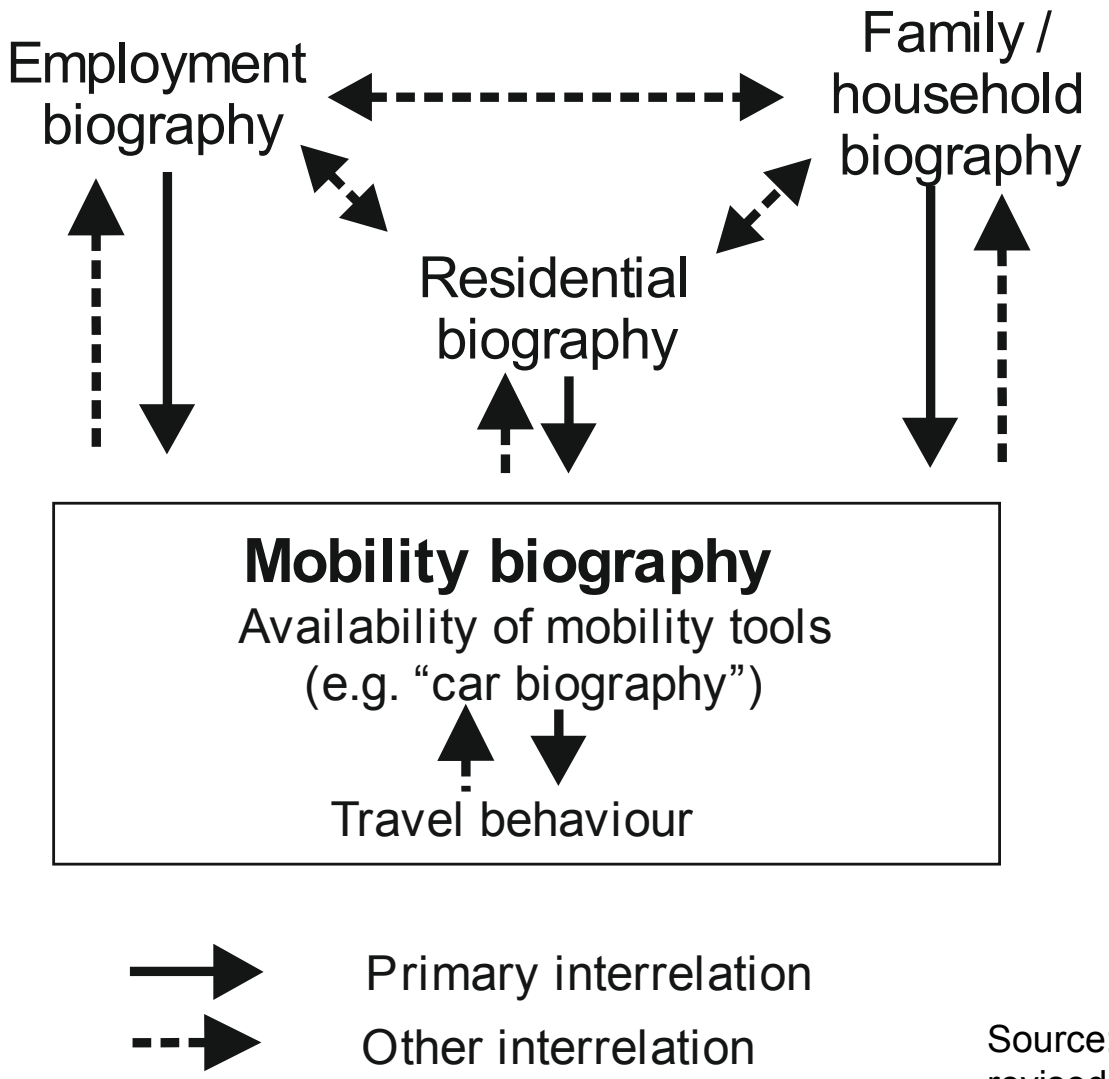
Time geography („daily path“, „life path“)

Mobility biographies – Idea

Broad approach to travel behaviour development over the life course

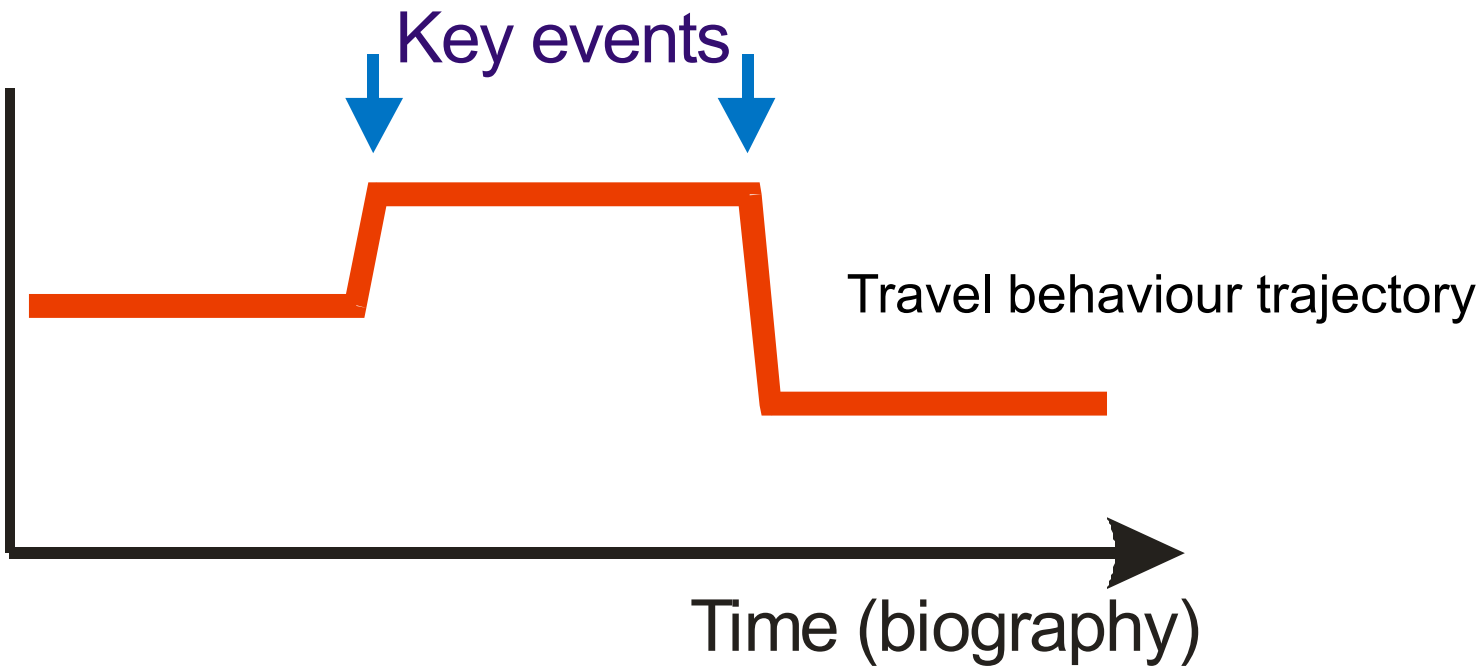
- Key events, incidents, transitions between life stages
- Habits (-> stability)
- Learning processes
- Mutual relationships between life domains ('partial biographies')
- Social embedding (linked lives, socialisation)

Mobility biographies – theoretical framework



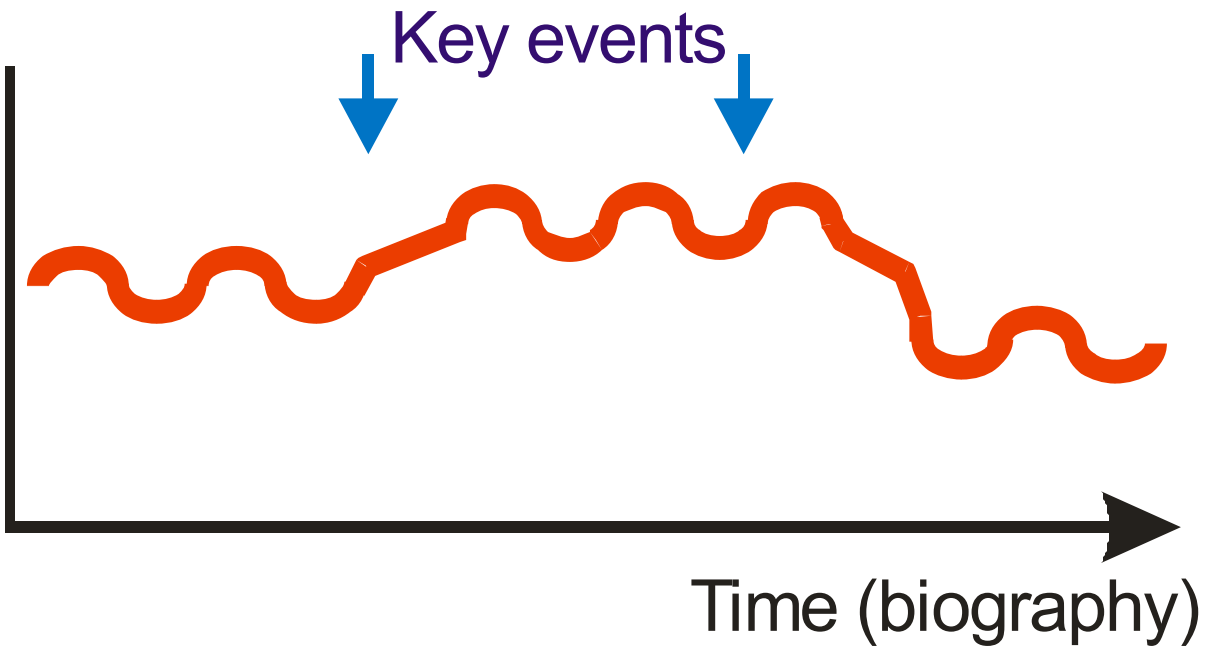
Source: Scheiner (2007), revised

Mobility biographies – Idea



Source: own concept

Mobility biographies – Idea



Source: own concept

Mobility biographies – key events

Source: own concept

Mobility biographies and gender

Gender and the life course

- Economics (labour market participation, labour market achievements: hours worked, income, position…)
- Sociology (housing, residential mobility, partnership / family, life events…)
- Psychology (partnership, family)

- **Gendered mobility biographies:**
  -> child birth
  (-> health in old age)
  -> ??

Empirical study

Research questions

- How do key events affect mode choice?
- Are key event effects gendered?

Data used

German Mobility Panel, 1994-2010

- Each participant takes part three times in three consecutive years
- Change = change from one year to the next
- Travel / activity pattern for a whole week
- All household members aged 10 or over
- Key events: sociodemographic plus access changes
- Regression models: n=12,555 weeks of report from 7,740 individuals
  (two observations of change for 4,815 individuals)

Variables

Dependent variables

- Change in mode use (mean number of trips per mode and day made over a week)

  - Car driving
  - Car passenger
  - Public transport
  - Cycling
  - Walking

Variables – state variables

- Number of children in household (three age brackets)
- Living with partner v. without a partner
- Urbanity (variety of facilities accessible on foot)
- population size of municipality of residence (six categories)
- Central residential location within city
- Education level
- Employment
- Walking distance from nearest PT stop to work/education
- Parking situation at place of work/education
- Driving license holding
- Car availability
- Cohort plus cohort squared
- Period (year of survey)
- Baseline values of mode choice

Variables – key events

Household/family biography

- Household foundation with partner
- Separation from partner
- Child's birth
- Child moving out

Residential biography

- Move to periphery / to centre
- Change in urbanity
- Change in PT quality in neighbourhood

Variables – key events

Educational / employment biography, access to work

- Start of apprenticeship
- Finished school or apprenticeship
- Entry into labour market
- Change in workplace
- Leaving labour market (no retirement)
- Retirement
- Change in PT connection to work or education
- Change in walking distance PT stop to place of work or ed.
- Change in parking situation at place of work or education

Mobility biography

- Gaining / loss of driving license
- Increase / decrease in car availability

Variables – key events

Start of modelling process including…

- 10 sociodemographic key events
- 22 access / urban context related events
- 29 state variables

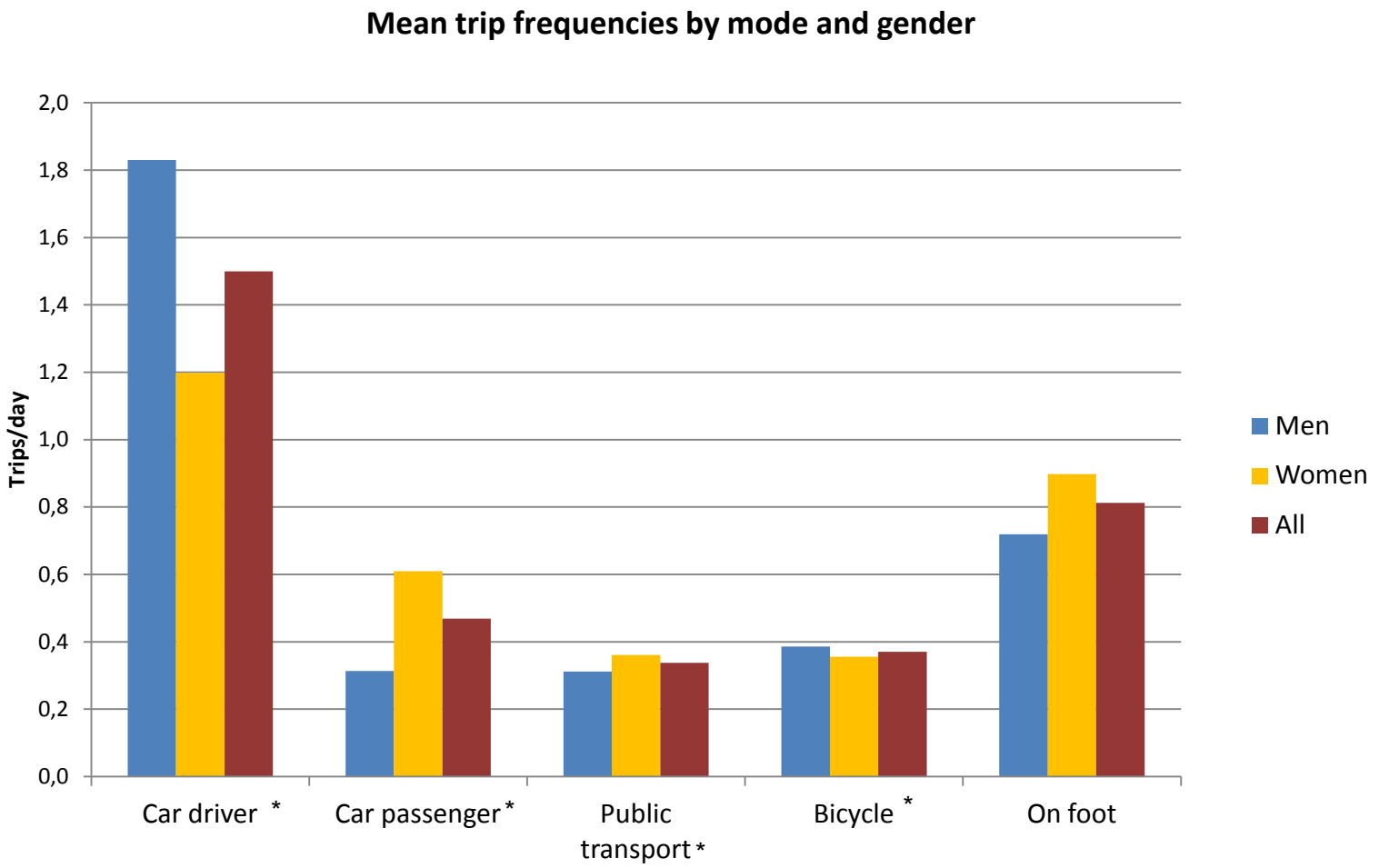
- … the majority of those was excluded from the final models

Analysis method

Method

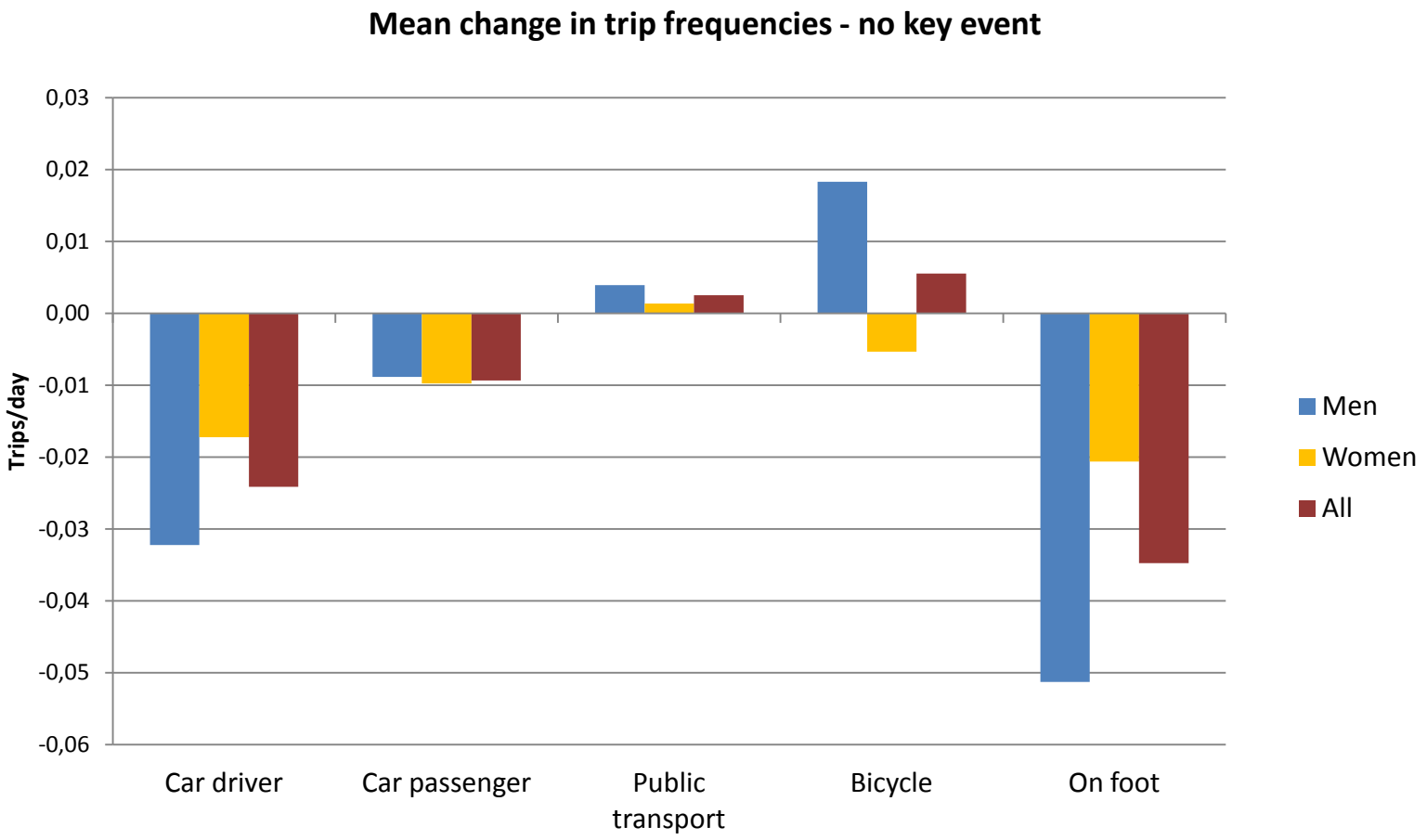
- Regression analysis
- Regress changes in mode use specific trip rates on:
  Key events (change variables)
  State variables
  Cohort
  Period
  Baseline behaviour (inertia/habit)
  Interactions between gender and all other variables
- Cluster-robust regression controlling for autocorrelation between subsequent observations

Results



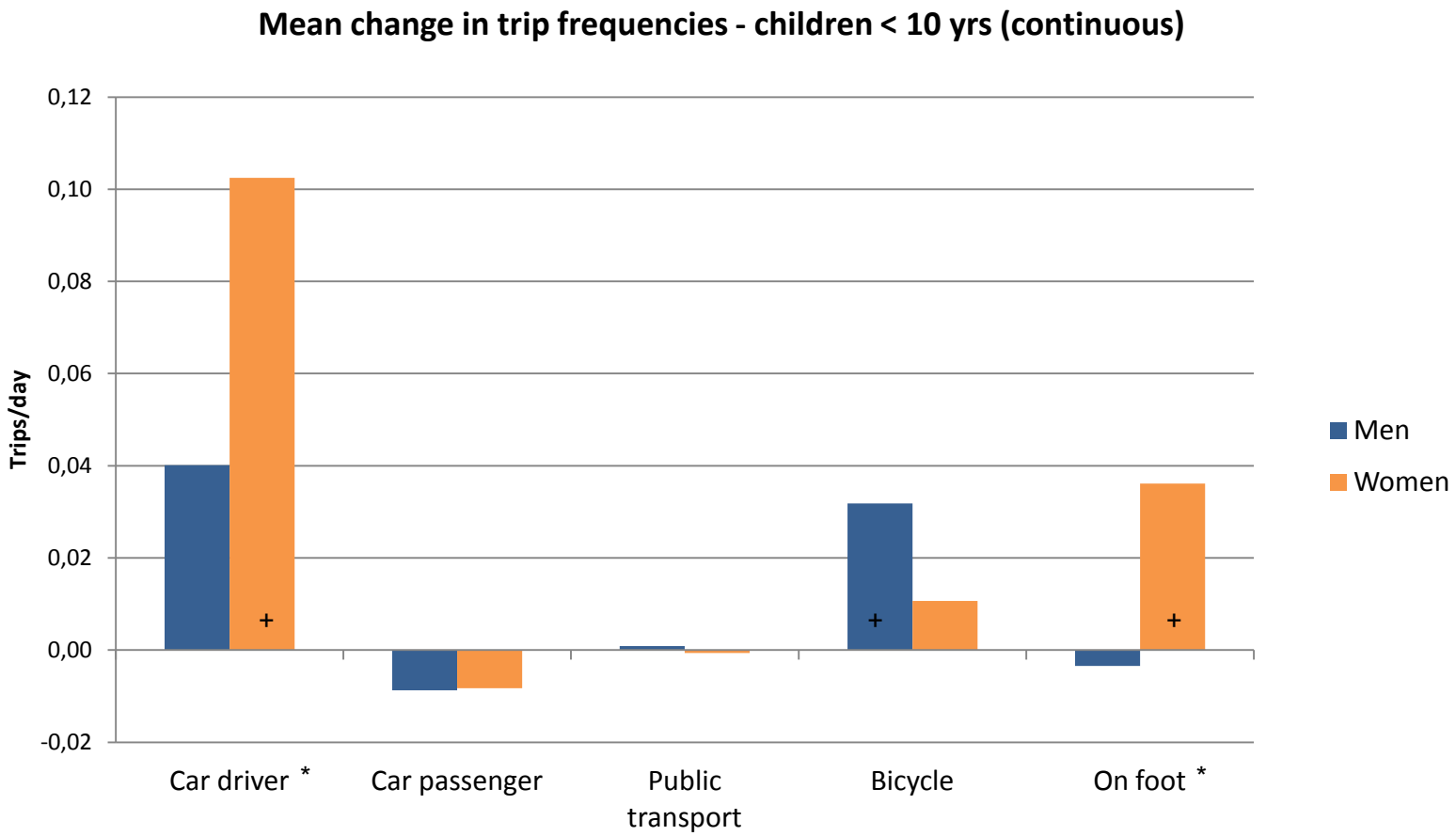
* Gender difference significant (p=0.05)

Results



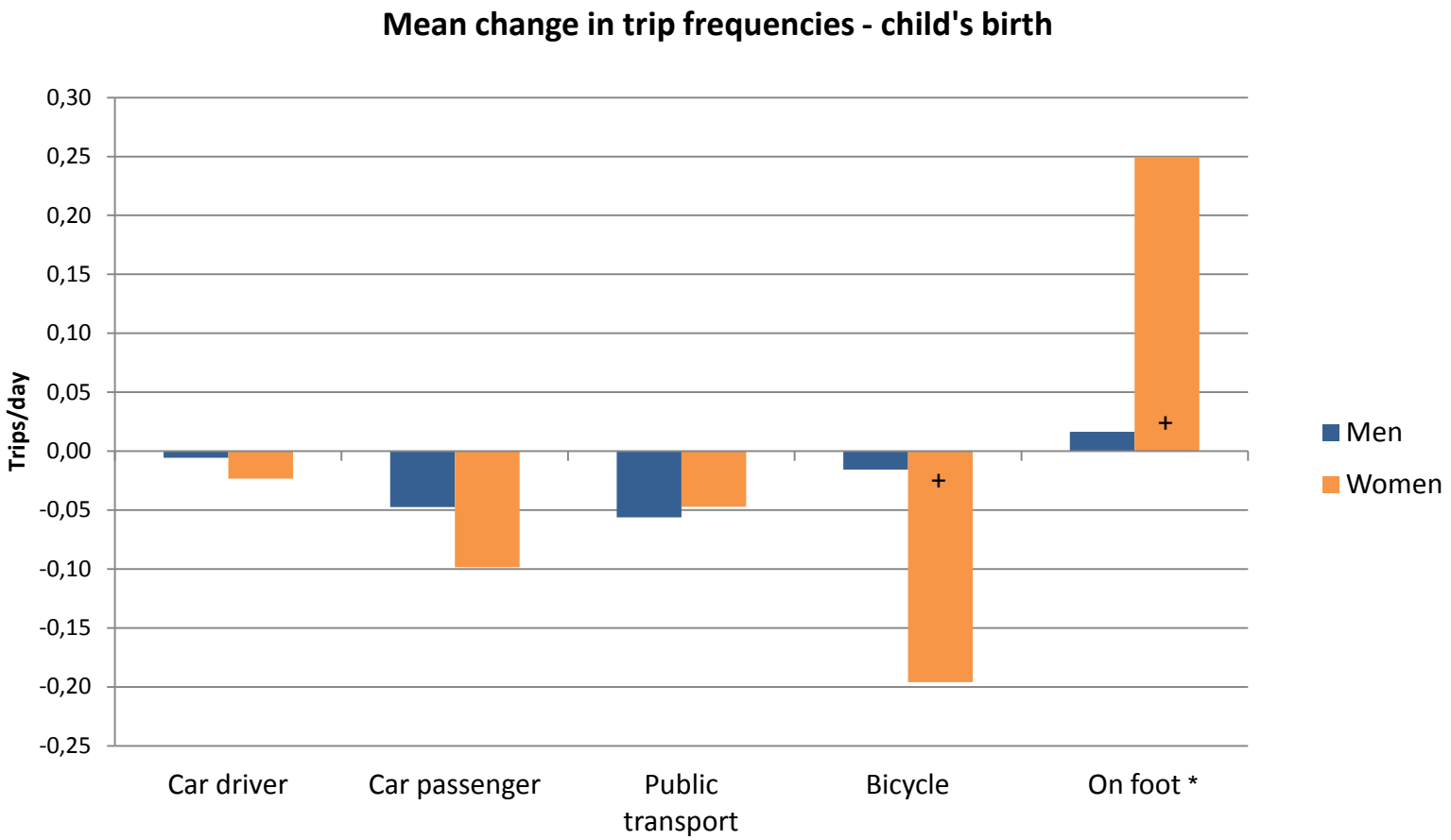
None of the values are significantly different from zero (p=0.05)

Results



+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)

Results



+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)

Results – summary table

	Effect on…		
	driving	**PT use**	**walking**
Life course			
Child's birth			**+W**
Entry into labour market	**+**		
Leaving labour market (no retirement)		**–W**	
Spatial environment			
Walking distance from PT stop to workplace decreases	**–W**	**+**	
Parking situation at workplace gets much worse / better	**–M / +W**	**0 / –W**	
Move to periphery / centre		**0 / +W**	**– / 0**
Increase / decrease in urbanity (land-use mix)			**+ / –**
Mobility tools			
Gaining driving license	**+**	–	
Loss / increase in car availability	**– / +**	**+ / –**	**0 / –W**
Other			
Cohort	***M**		
Period	**–W**		**+W**
Baseline behaviour	–	–	–

+ positive effect, – negative effect, 0 no effect. M: effect only for men, W: effect only for women.
* positive effect turning into negative from one cohort to the next.

Conclusions – results

- Few significant events
- Few significant interactions between gender and events
- -> many life course events may be only loosely associated with travel mode use, and the same is true for gender structures in the life course
- Interpretation difficult
  -> Habitual mode use (baseline behaviour effects!)
  -> lead or lagged reactions
  -> freedom of choice (-> changes in various and unexpected directions, if any)
  -> lack of freedom of choice
  -> best choice has already been made

Conclusions – results

- State variable effects
  … may be due to earlier events (and, hence, to adaptation or learning processes)
  … may suggest that habits intensify over time just because there is no change in circumstances
- Composition of cohort and period effects in driving is different for men and women
  - cohort effects among men (maximum in driving reached by those born in the 1960s)
  - period effects among women (general decline in driving over the study period)
- Taken together: declining car use plus gender convergence

Conclusions – data issues

- No information on attitudes
- Little knowledge on attitude emergence
  - specifically, the role of the built and social environment
- Attitudes on...
  ...travel modes, travel tolerance,
  ...gender, worksharing, social roles, breadwinning
- Little information on the built environment (data protection laws, no geocodes)
- No personal income information
- Multi-day data permit to construct metric variables of mode use
- Multi-day data permit to construct worksharing arrangements from activity patterns and, hence, look at nuances of changes in worksharing (rather than key events, such as entering the labour market)

Conclusions – sustainability issues

- ???

The results may suggest…

- gendered worksharing (effect of childbirth),
- gendered adaptations to spatial context (effects of residential moves),
- powered negotiations between two partners over access to the car,
- or gender specific preferences deliberately developed by individuals

Many thanks.

Ampelmännchen und Ampelweibchen
(Zwickau; Wikipedia, Foto Andre Karwath 2005)

Gender and mode choice

Gender / feminist studies

- Women are disadvantaged in terms of access to ‚good' travel modes
- ‚Good' (from an individual and equity perspective): fast, convenient modes that allow to cover large areas
- = Cars
- –> Increases in driving after life course events may be expected to be stronger for men than women, while decreases in driving are stronger for women than men
- On the other hand, women's travel may be less habitual –> stronger tendency for change

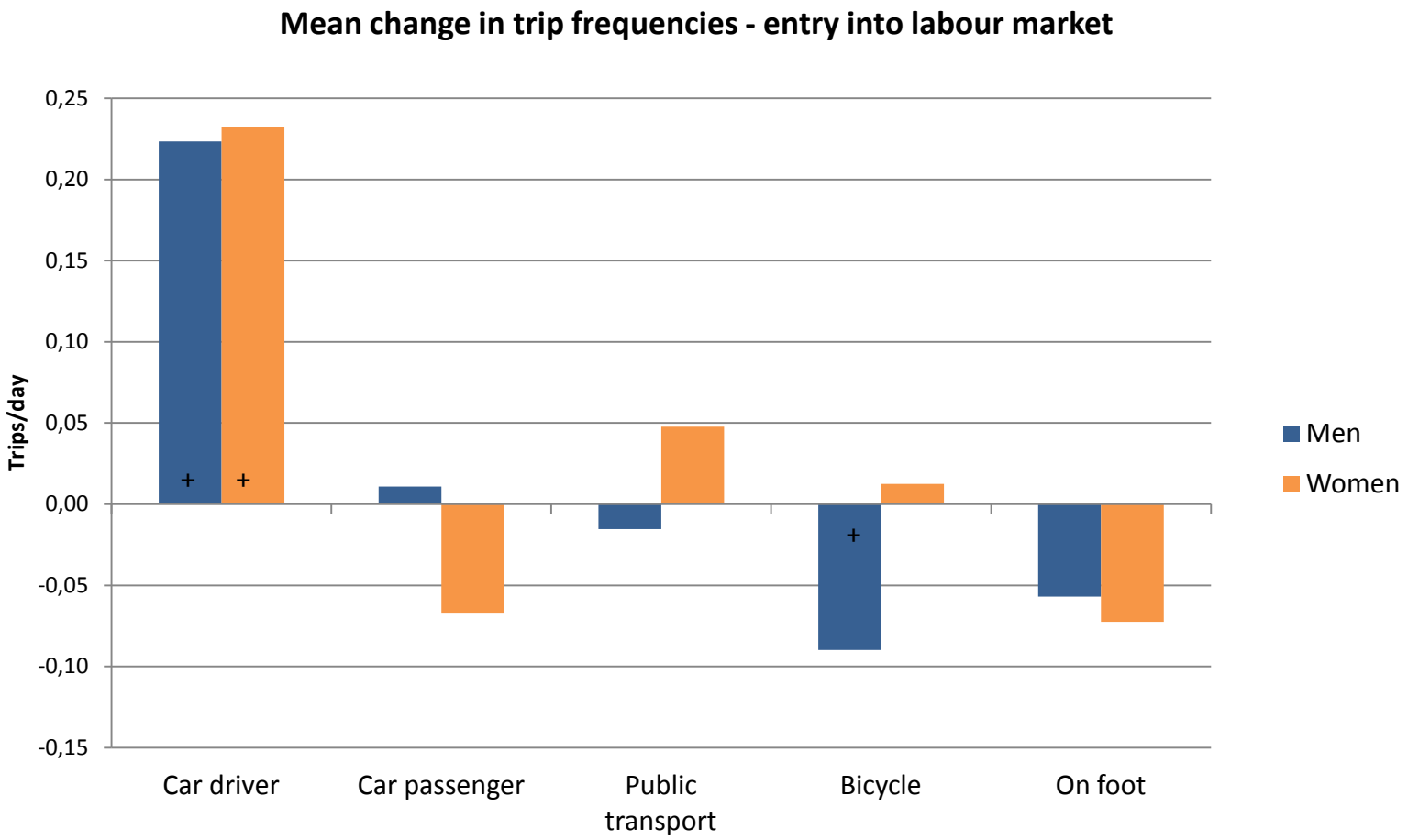
Gender and mode choice

Hypotheses

- Access to resources (transport, money, time, space) -> economics
- Social roles (household /family commitment) -> sociology
- Gender(ed) preferences -> sociology, psychology
- Patriarchy (overarching all over inequalities and differences) -> feminism

(all approaches potentially reflect power relations; possible exception: preferences)

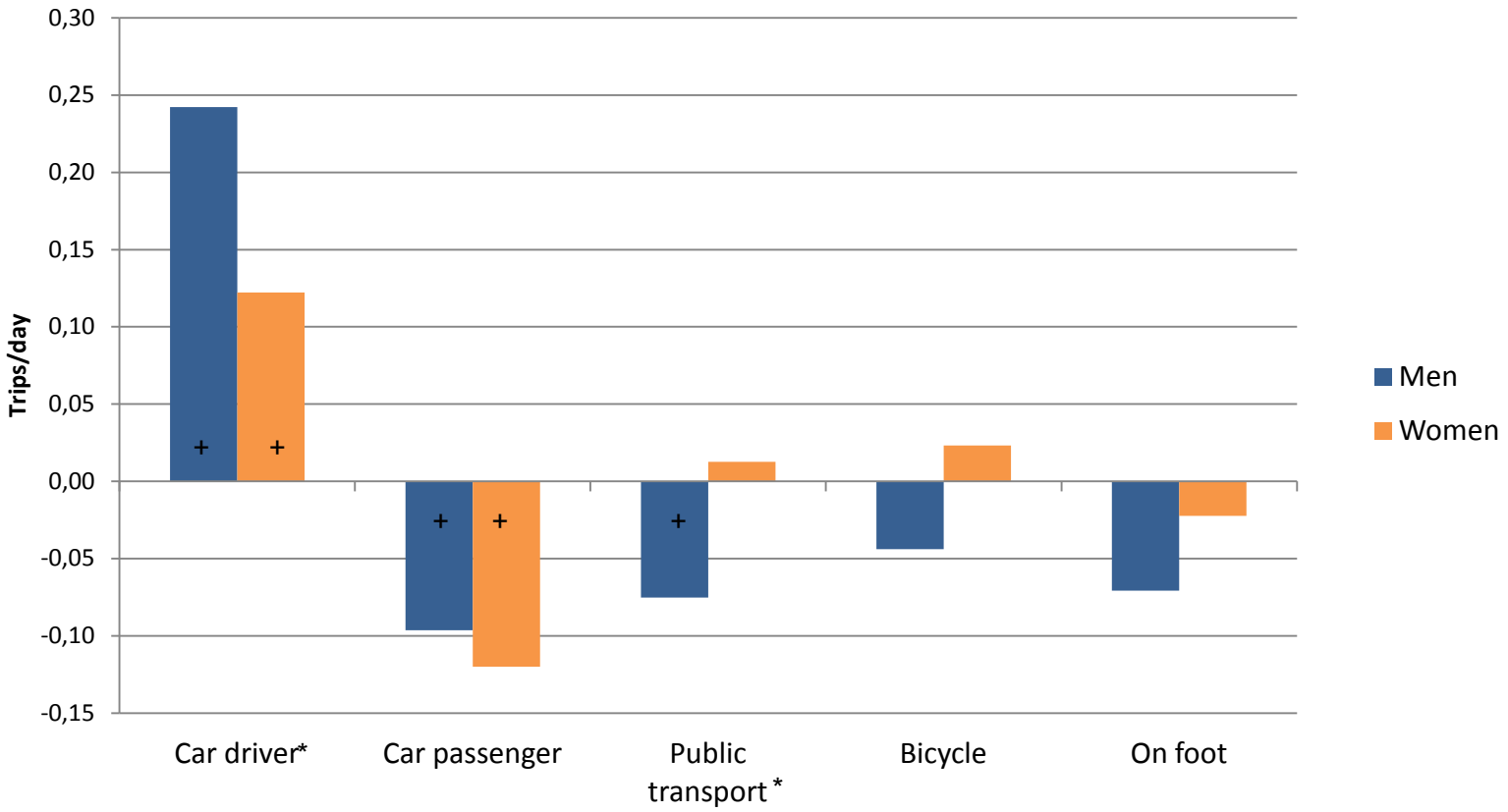
Results



+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)

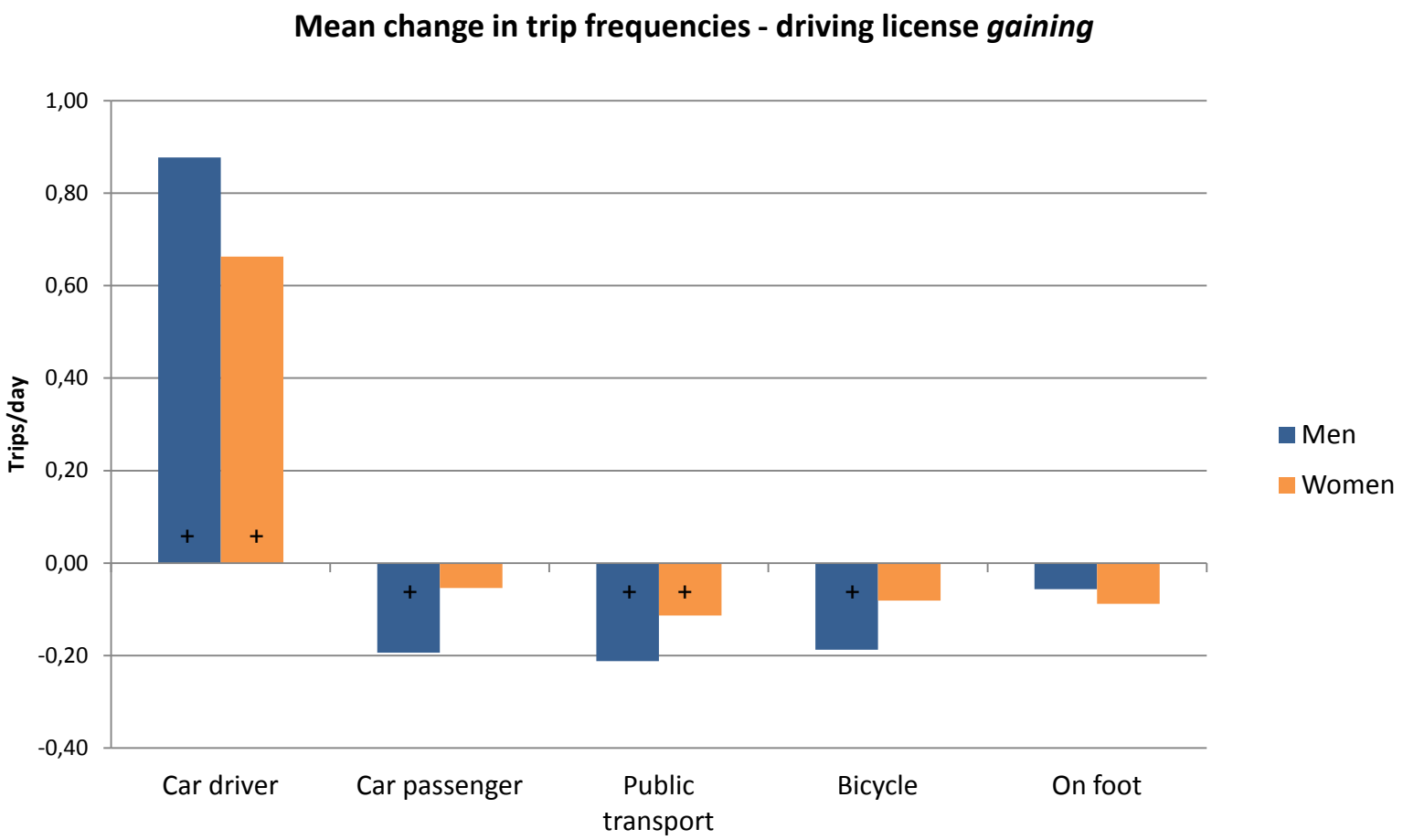
Results

Mean change in trip frequencies - driving license *holding*



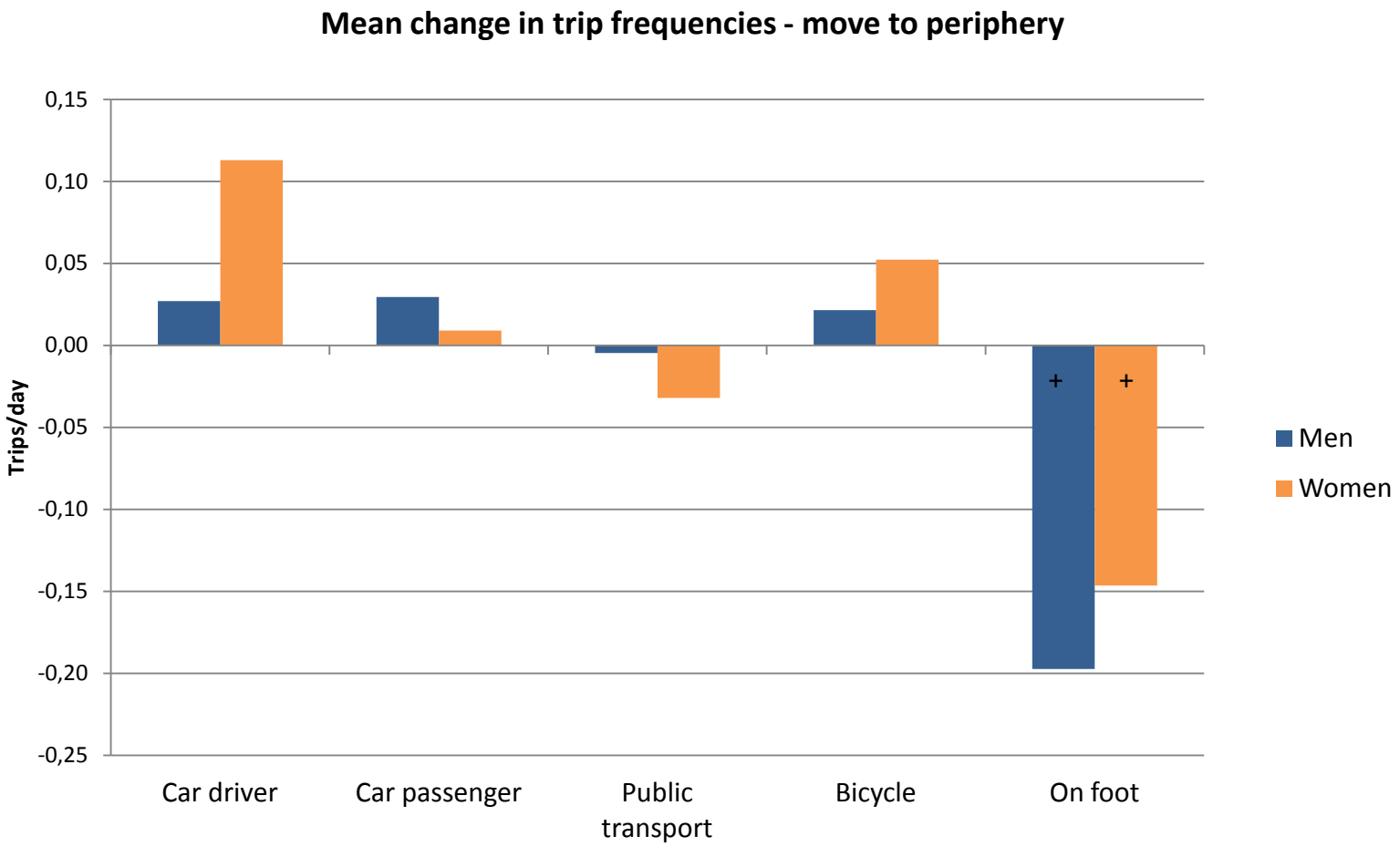
+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)

Results



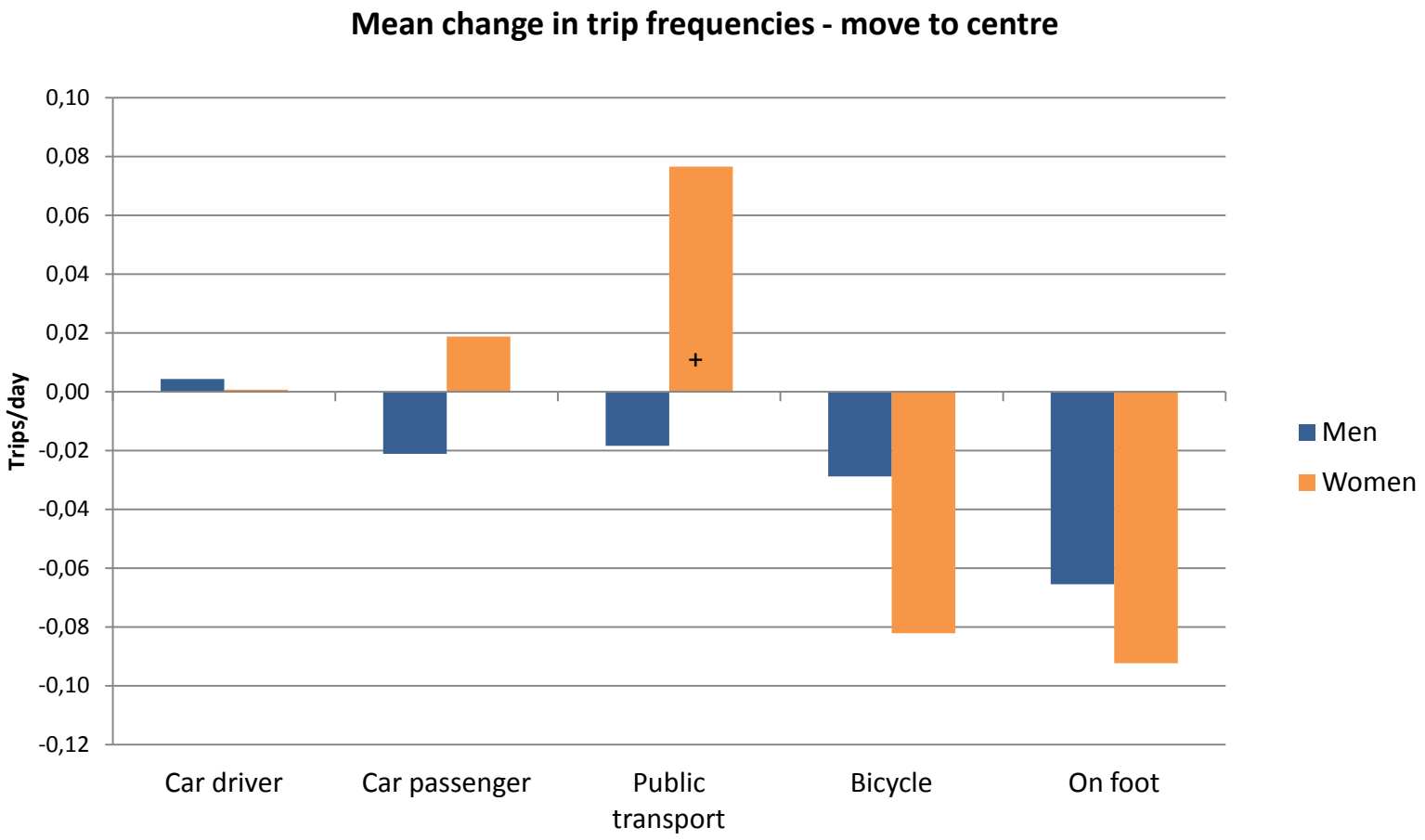
+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)

Results



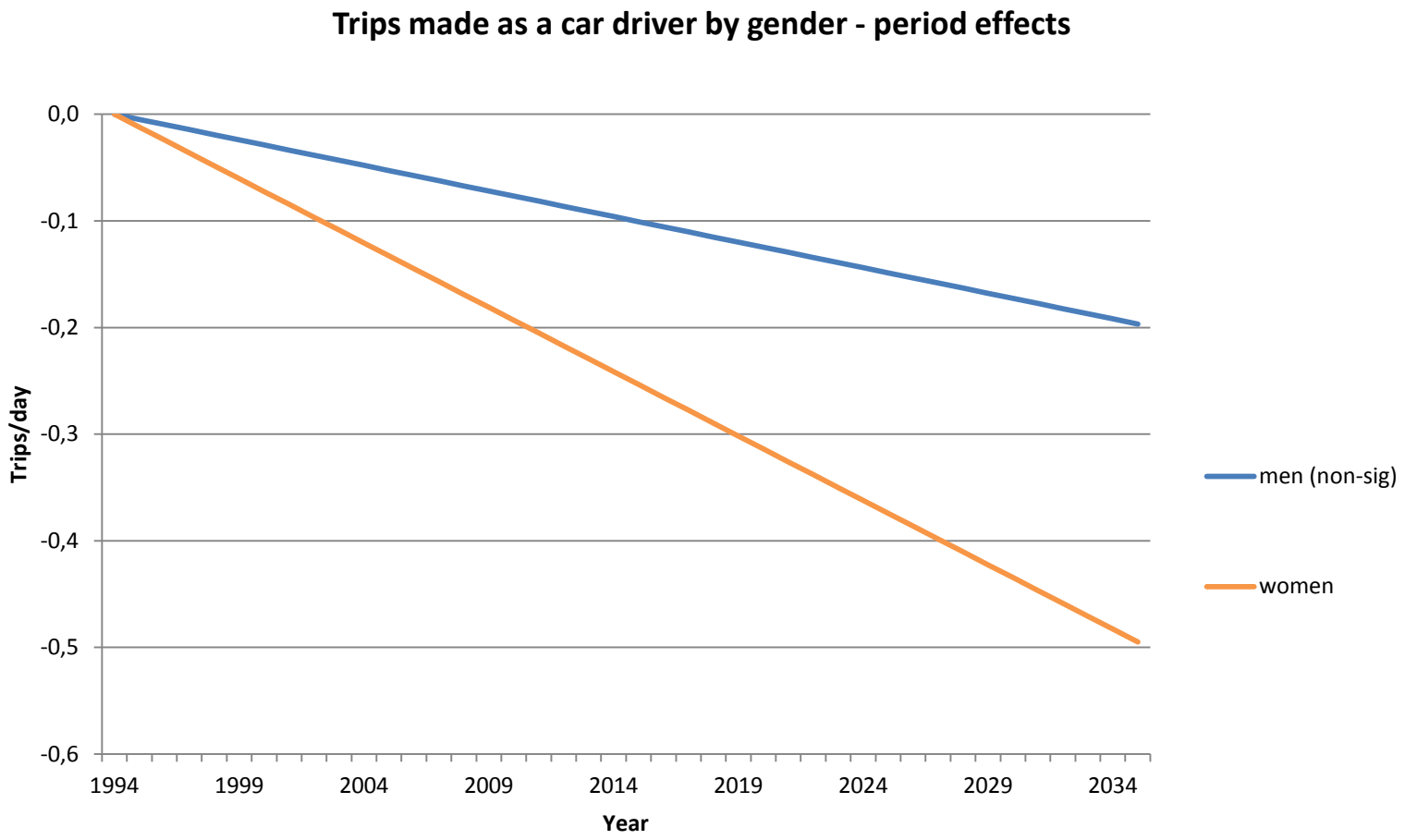
+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)

Results

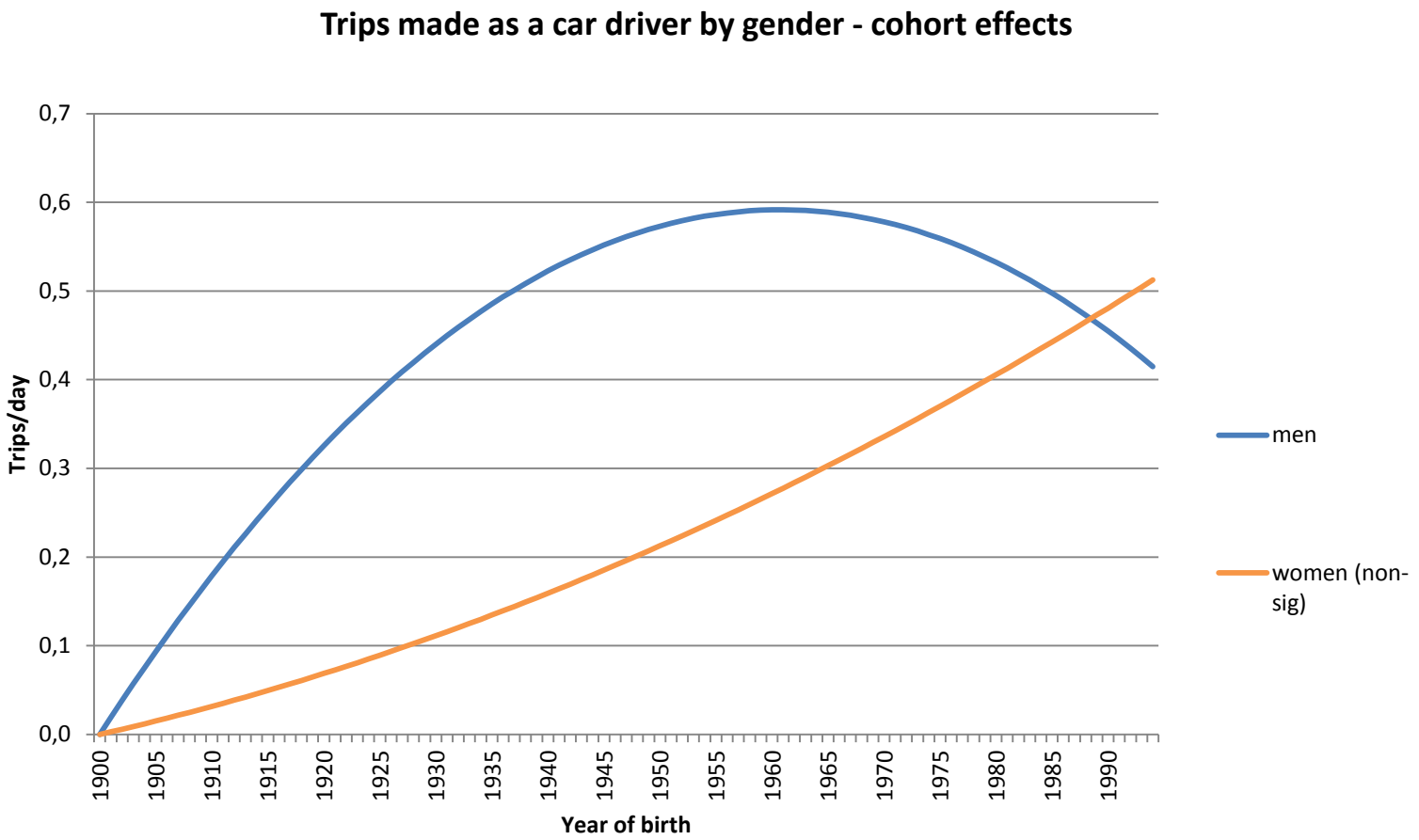


+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)

Results

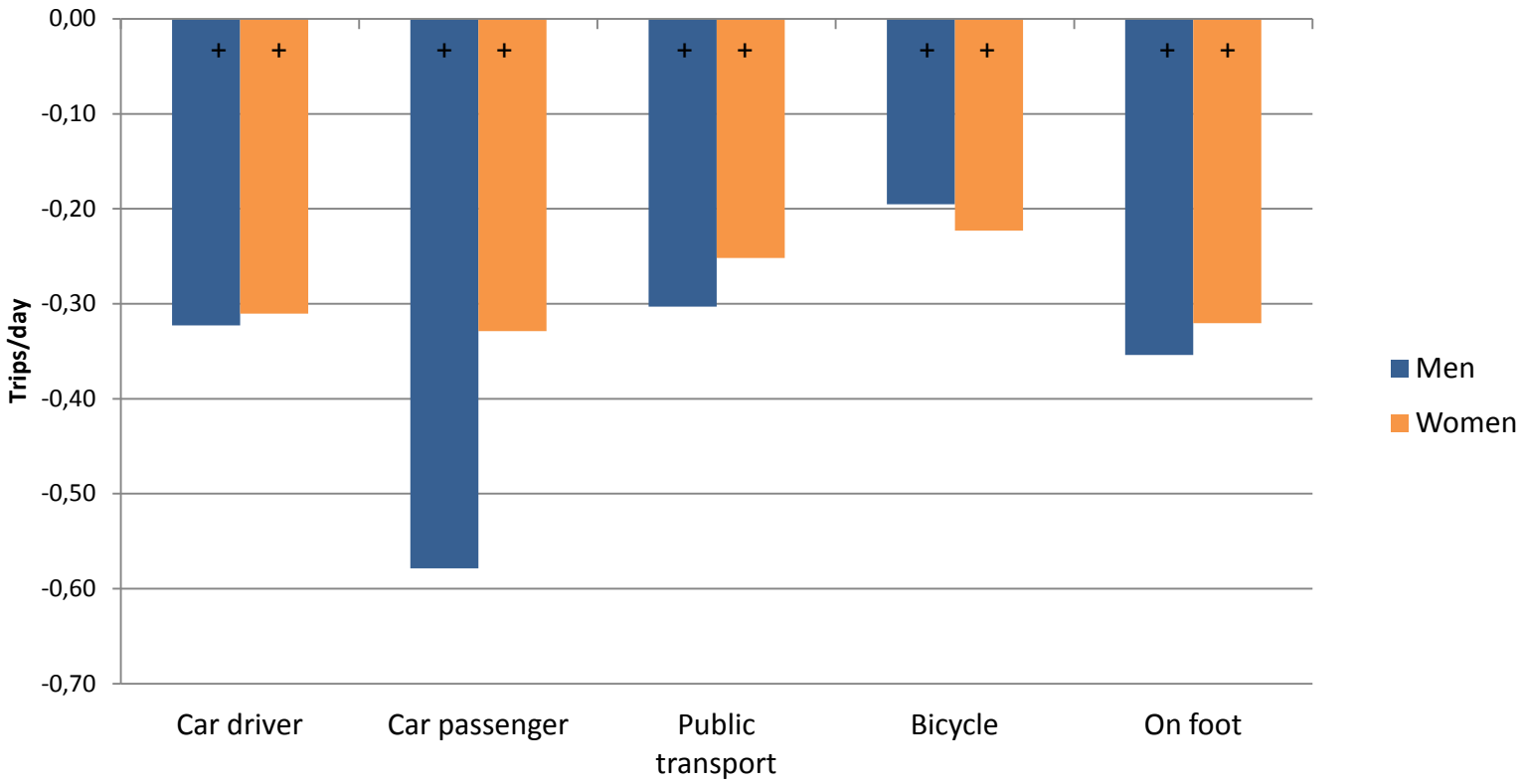

Trips made as a car driver by gender - period effects
0,0
-0,1
-0,2
-0,3
-0,4
-0,5
-0,6
Trips/day
1994
1999
2004
2009
2014
2019
2024
2029
2034
Year
men (non-sig)
women

Results


Trips made as a car driver by gender - cohort effects
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0,0
Trips/day
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
Year of birth
men
women (non-sig)

Results

Mean change in trip frequencies - number of trips made by the respective mode (path dependency)



+ Marginal effect in regression significantly different from zero (p=0.05)
* Gender difference (interaction term) significant (p=0.05)