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Date 25/09/18

# What Prompts People to Start Cycling: The Research Evidence



EUROPEAN CYCLING SUMMIT  
Salzburg // 24 - 26/08/2018

> cycling culture moves



Centre for  
Transport &  
Society

# Motivation

- Amount of cycling remains low in the UK and many other EU countries
- Despite much talk and some investment
- Lack of evidence on what increases cycling prevents effective strategies/measures

# Purpose of presentation

To understand the circumstances in which people start/stop or increase/decrease cycling

# Presentation structure

1. Type of evidence needed
2. Review of evidence
3. Conclusions

# **1. Type of Evidence Needed**

# Cross-sectional comparisons




# Need for longitudinal studies


With respect to factors that influence cycling Heinen et al (2010) stated:

*"...conducting longitudinal research would allow one to detect the most important factors at the level of the individual."*


# Longitudinal studies can help answer questions such as...




Who changed  
their cycling  
behaviour?



How did  
they  
change it?



Why did  
they change  
it?



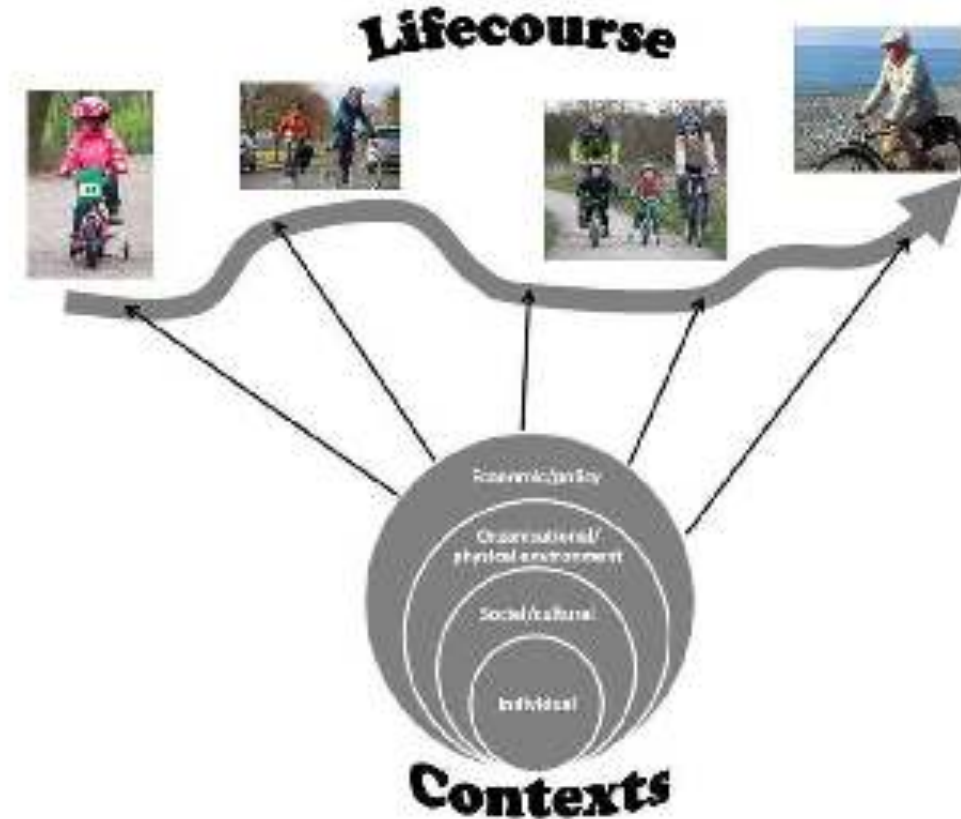
Did they  
maintain the  
change?



## **2. Review of Evidence**

# Structure of review

- Day-to-day cycling
- Year-to-year cycling
- Life events
- Interventions



# Day-to-day cycling

- One half of commuter cyclists do not cycle to work every day (Heinen et al., 2011; Bartle et al., 2016; Ahmed et al., 2017)
- Decision to cycle influenced by schedules, weather and temporary events (Heinen et al., 2011; Bartle et al., 2016; Ahmed et al., 2017)

*“Travel largely dictated by weather Monday to Wednesday as will cycle if ok, will drive alone if extremely wet, or if I am ill e.g. have a cold. Thursday to Friday I always drive as I take my child to nursery on these days”* [Bristol cycle commuter, July 2015. Source: Bartle et al., 2016]

# Year-to-year cycling

- Car drivers more likely to persist in driving to work one year later than cyclists in cycling to work (Clark et al., 2016)

# Commuting mode one year later

	% of people switching to commute mode by year t+1							
Commute mode in year t	Car	Walk	WFH	Bus	Train	Cycle	Metro	Other
Car	91.4%	2.5%	2.1%	1.1%	1.0%	0.6%	0.3%	1.0%
Walk	13.3%	76.1%	1.5%	4.6%	1.3%	1.6%	0.5%	1.0%
WFH	26.5%	3.5%	62.4%	0.8%	3.0%	0.6%	1.0%	2.3%
Bus	16.6%	8.4%	1.1%	65.8%	2.7%	1.7%	2.5%	1.4%
Train	9.3%	2.9%	2.7%	5.7%	70.7%	1.0%	6.6%	1.0%
Cycle	16.3%	9.0%	0.8%	1.7%	1.9%	67.4%	1.0%	1.9%
Metro	6.8%	2.0%	2.4%	8.3%	13.1%	1.5%	64.3%	1.5%
Other	29.4%	10.6%	4.1%	2.4%	4.5%	3.3%	2.9%	42.9%

Source: Understanding Society (15,200 workers in England)

# Year-to-year cycling

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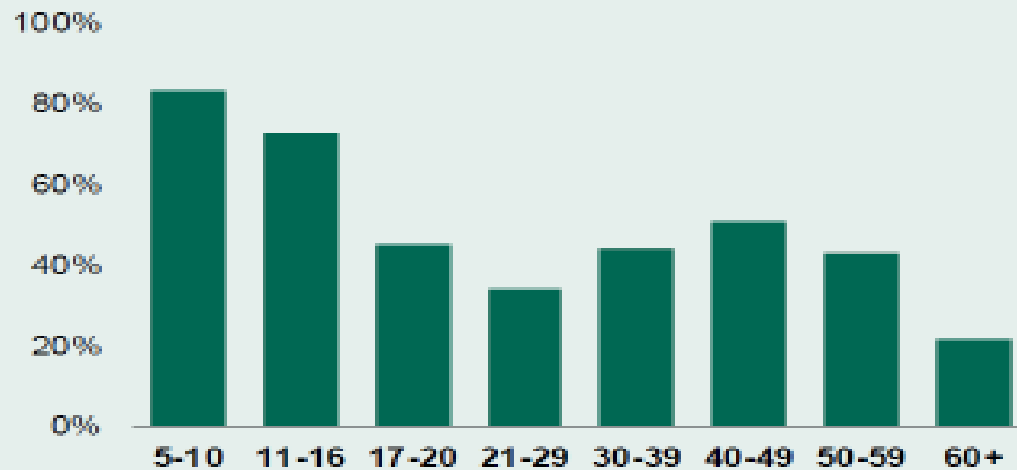
# Year-to-year cycling

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- Public transport users and walkers more likely to switch to cycling to work than car drivers (Clark et al., 2016)
- Shift towards more cycling is more likely for those already partly cycling ('multimodals') (Kroesen, 2014; de Haas et al., 2018)
- Cycling for work and non-work are positively reciprocating (Kroesen and Handy, 2014)



## Access to a bicycle [NTS0608]

Proportion who own or have use of a bicycle, by age band: 2013-15 combined



# Stages of life



# Life events (1)

## School and college

Positive attitudes towards cycling decrease as children move through schools (Underwood et al, 2014)

Going to college linked to increase in cycling (Rau and Manton, 2016)



## Driving licence

Acquiring a driving licence associated with decrease in cycling frequency (Scheiner and Holz-Rau, 2013)



# Life events (2)

## Employment

Changes in employment (status/workplace) associated both with starting/stopping cycling (Chatterjee et al., 2013; Oakil, 2013; Busch-Geertsema and Lanzendorf, 2017)



## Moving home

Changes to access to facilities associated with utility cycling and to physical layout with leisure cycling (Beenackers et al., 2012)

Mobility culture of new and old location matter (Smart, 2010; Klinger and Lanzendorf, 2016)



# Life events (3)

## Social relationships

Partners, friends and colleagues encourage returns to cycling (Bonham and Wilson, 2012; Sherwin et al., 2014)



## Children

Birth of a child associated with decreased cycling (Scheiner and Holz-Rau, 2013) but the opposite effect found for some parents (Lanzendorf, 2010)



# Life events (4)

## Health

Health concerns encourage cycling in mid-to-later life (Bonham and Wilson, 2012) but health difficulties prevent continued cycling although individuals adapt to continue (Jones et al., 2016)

## Retirement

Retirement associated with increase in cycling (Scheiner and Holz-Rau, 2013)





# Interventions – summary of evidence

Type	Summary of evidence
Training	Increases cycling confidence and frequency (adults and children)
Trials/Events	Leads to sustained take up of cycling but participation rates can be low
Destination-based (e.g. workplace)	Increases cycling mode share if conditions are supportive. Long-term effects unknown.
Bike hire	Most users switch from using own bikes, walking or public transport.
Physical infrastructure	Extent of new cyclists not shown to be large. Those in closer proximity increase cycling more.
City-wide multiple measures	Increases in cycling in some cases which can grow in longer term

# Ride to Work Day in Victoria (Australia)

- 5577 people registered in 2005
- 1 in 4 of first timers (cycling to work) still rode 5 months later
- 57% of first timers said event had influenced decision to cycle to work
- Women more likely to be first timers and continue cycling to work
- First timers cycled to work less frequently than established riders

Source: Follow-up survey results reported in Rose and Marfurt (2007)



# Cambridgeshire Guided Busway (Eng.)

- New busway in 2011 included a traffic free walking and cycling route
- Those living close to the busway more likely to
  - Use the busway for cycling
  - Increase cycle commuting (by 34% if lived within 4kms instead of 9kms)
- Those who increased cycling had a mean increase of 80 minutes per week, implying they were new cycle commuters

Source: Panel survey results reported in Panter et al. (2015)

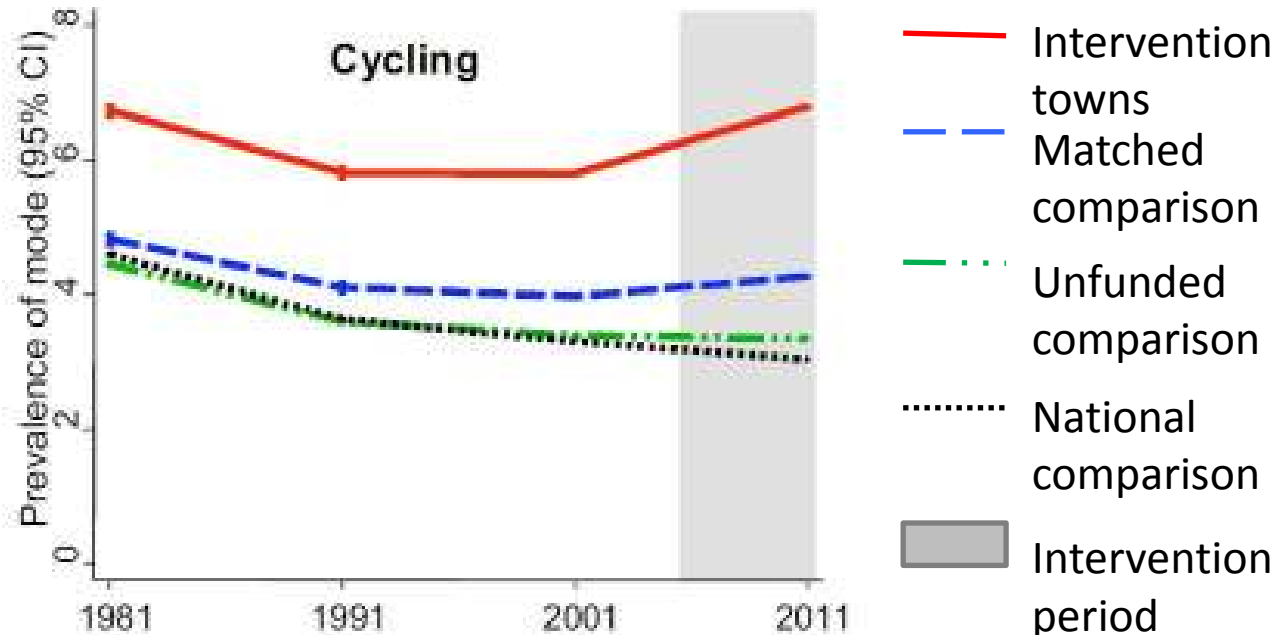




# Cycling Cities and Towns (Eng.)

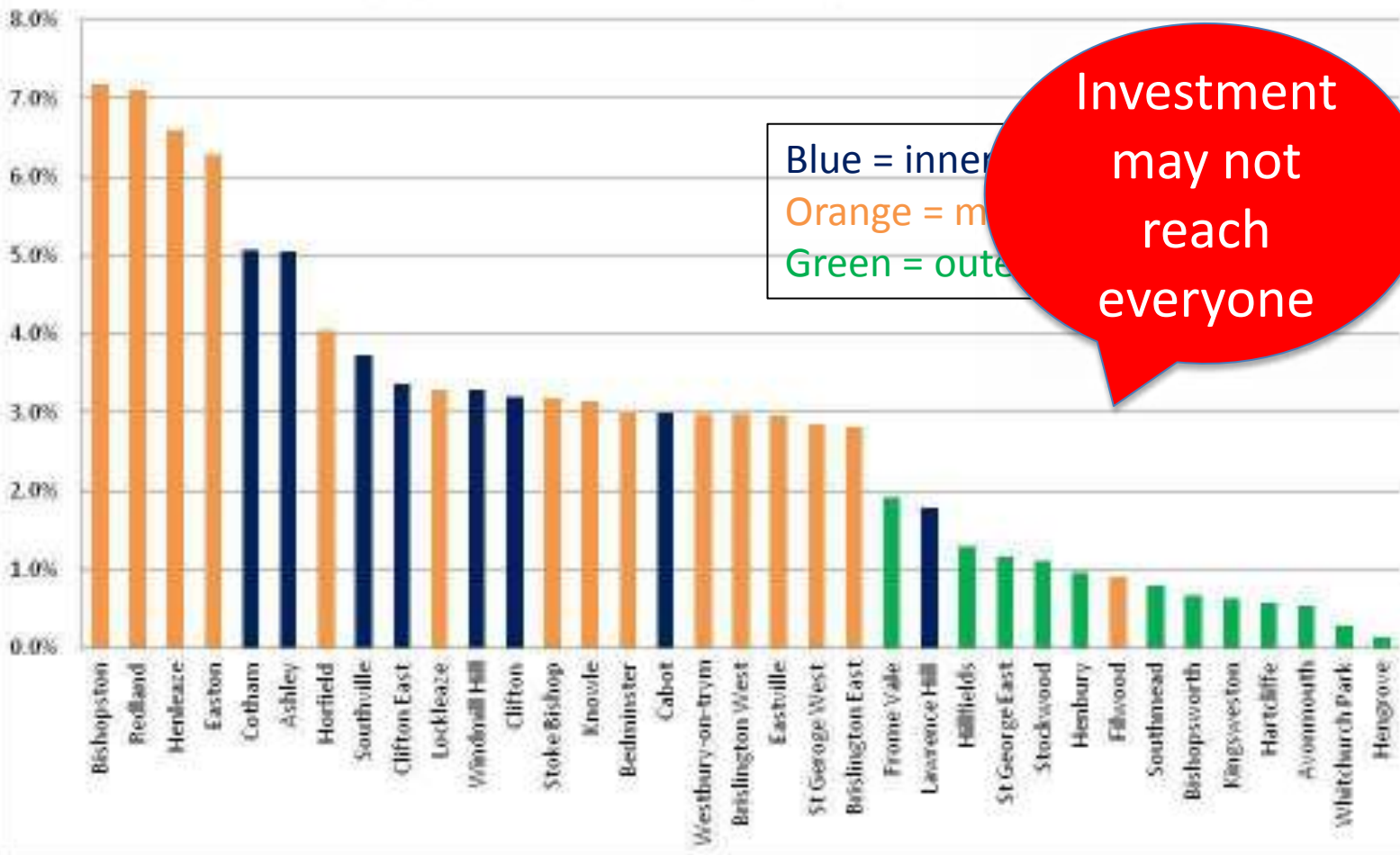
- Mixtures of capital investment (e.g. cycle lanes) and revenue investment (e.g. cycle training) (2005-11)
- Prevalence of cycling to work rose from 5.8% in 2001 to 6.8% in 2011

Source: Census data analysis by Goodman et al. (2013)



# Bristol

Percentage point increase in cycling to work mode share



Source:  
Census data  
analysis by  
Chatterjee

# 3. Conclusions

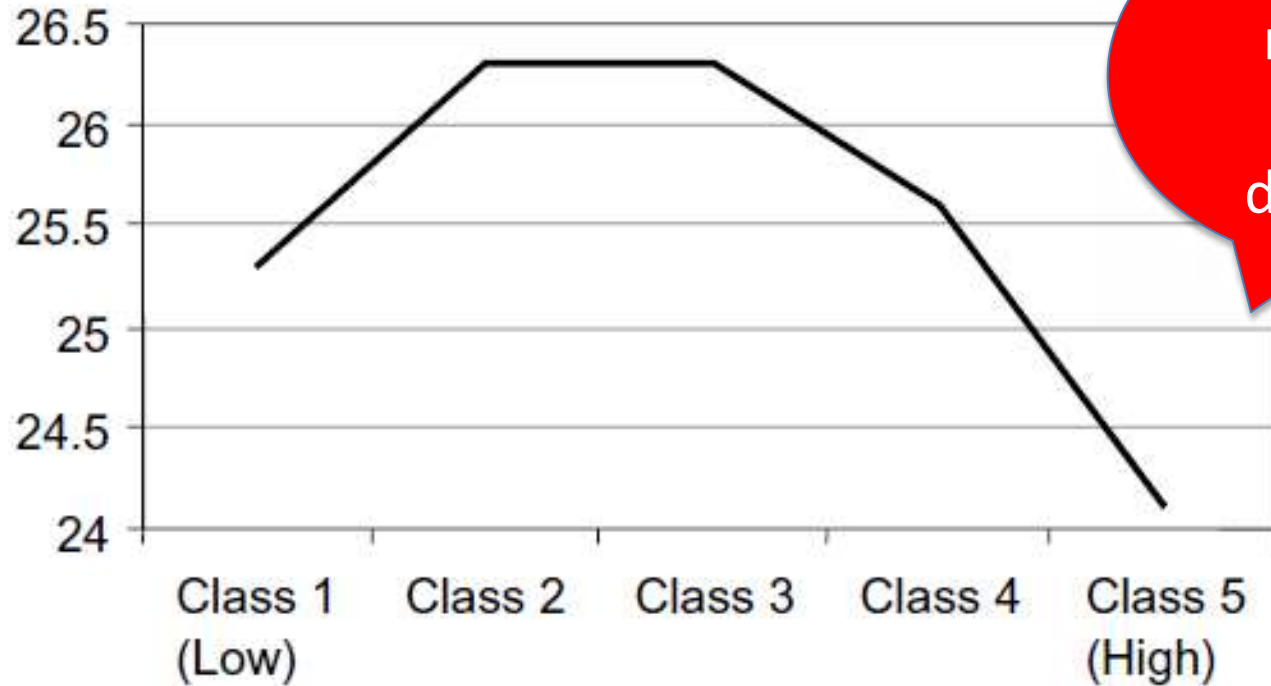
# What prompts people to start cycling?

- Evidence that interventions increase cyclists/cycling, although reach is often limited and longevity uncertain
- Evaluation limitations make it difficult to assess long-term impact of specific interventions
- Long-term, city-wide investment is key (with priority for cycling over other transport modes)
- Life events increase likelihood of behavioural change – target people at life change moments

Thanks for you  
attention



# Cross-sectional analysis



Cannot  
modify  
pop.  
density?

Proportion of bicycle trips per person per day (y-axis) versus population density (x-axis) for Netherlands (source: Rietveld and Daniel (2004))

# Types of longitudinal studies

Type of study	Contribution
Time-series observations	Aggregate change in activity over time
Repeated cross-sectional survey	Aggregate change in attitudes & behaviour over time
Retrospective cross-sectional survey	Self-reported behavioural histories
Life history interviews	Interviewer-prompted behavioural histories
Panel study	Tracking at regular intervals of individual attitudes and behaviour for population representative sample
Cohort study	Tracking at regular intervals of individual attitudes and behaviour for a particular group

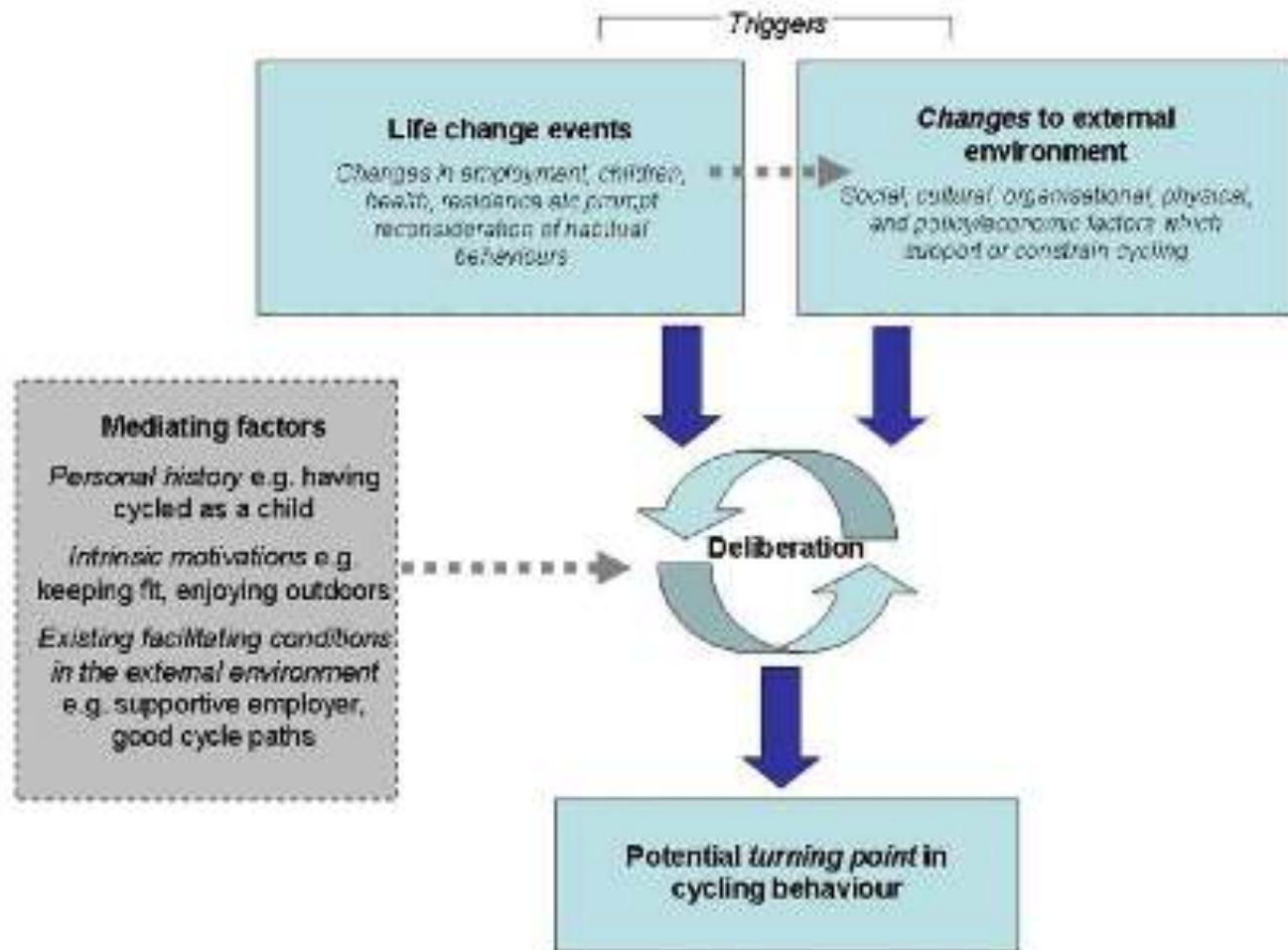
# Scope of review

- Longitudinal studies (of change over time)
- Studies explicitly considering cycling behaviour
- Academic literature across disciplines
- Systematic reviews and own collections of literature



# Combination of life events and interventions

Source:  
Chatterjee et  
al. (2013)





mobilitäts  
agentur  
wien



Die große Perspektive:

Was es für die Verdoppelung  
des Radverkehrs braucht.

# 1. Radfahrkompetente Kinder





**EXPERTEN SCHLAGEN  
ALARM**

**Kleine Zeitung** 

## **In Graz verlernen die Kinder das Radfahren**

40 Prozent der Volksschüler haben  
zuletzt die Radfahrprüfung nicht  
geschafft. Kann man den Lenker  
herumreißen?

Von **Michael Saria** | 11.53 Uhr, 23.  
September 2018

mobilitäts  
agentur  
wien



# Radfahren in den Schulunterricht integrieren

mobilitäts  
agentur  
wien



Fröhschwimmer



Freischwimmer



Fahrtenschwimmer



Allroundschwimmer



Helfer



Retter



Lifesaver



Schwimmlehrer



Rettungs-  
Schwimmlehrer

# Dreifachnutzen: Klimaschutz, gesunde Kinder, mehr Sicherheit



- Lehrpläne Primar  
Sekundarstufe  
aufnehmen
- Fahrradabzeichen  
einführen
- Fahrradprüfung  
Unterrichts
- Kompetenzen  
PädagogInnen  
aufbauen

# 2. Radfahren selbstverständlich machen





# Starke Kampagnen wirken



- Breite Bewusstseinsbildungskampagnen Alltagsradfahren umsetzen
- Weiterbildungsprogramme für alle Entscheidungsträger Ebenen zum Kompetenzaufbau etablieren
- Politisches Commitment herstellen



# 3. Moderne Fahrräder für Österreich

mobilitäts  
agentur  
wien



# 2017: Mehr Transportfahräder als E-Autos in Wien gefördert \*

mobilitäts  
agentur  
wien



\* bis die  
Fördersumme  
verbraucht  
war

\* Newspapers and  
around 2000 funding by government

\*\* Funding by Mobility of Vienna  
with around 10000

# 2018: Mehr als die Hälfte der Neuwagen sind Firmenwagen

Mit einem vorsichtigen Berechnungsansatz kommt die OECD für Österreich auf einen Steuerentgang von jährlich rund 1.500 Euro pro Fahrzeug und fast 600 Millionen Euro insgesamt.



# Kaufanreize für neue und sichere Fahrräder schaffen



- Förderaktionen Bikes und Transportfahrräder einführen
- Den Kauf Alltagsfahrrädern steuerlich absetzbar machen



# 4. Sichere und komfortable Radwege für Österreich



# Mariahilfer Straße: Vorher

mobilitäts  
agentur  
wien





# Mariahilfer Straße: Nachher

mobilitäts  
agentur  
wien



# David und Goliath

„Diese Förderungen  
lösten insgesamt  
Investitionen von 210  
Millionen Euro aus“

(Masterplan Radfahren, bmlfuw  
2015, zu Investitionen in  
Radverkehrsinfrastruktur über den  
jährigen Zeitraum 2007

Die aktuelle Sechs  
Jahres Planung sieht  
bis 2023 insgesamt  
7,8 Milliarden Euro  
für das hochrangige  
Straßennetz vor

(Asfinag, 13.2.2018)



# 5 Milliarden Euro für Radwege



- einer nationalen Kraftanstrengung werden 2030 5 Milliarden Euro in Radinfrastruktur investiert zusätzlich
- Baulandwidmungen ohne Radweganschluss mehr Ausnahmefällen möglich

# Verkehrsregeln sind oft wenig radfreundlich

Hier auf  
10 km/h  
abbremsen!



Neben-  
einander  
radeln  
verboten!



Rechts  
abbiegen bei  
Rot für  
RadfahrerInnen.  
Nicht in  
Österreich



# 5. Vorrang für den Radverkehr

- Radverkehr StVO  
Richtlinien  
systematisch  
bevorzugen
- Rechts abbiegen  
Radfahrer  
erlauben
- Tempo 30  
innerorts die Regel
- Nebeneinander  
Radfahren erlauben





# Das Fünf-Punkte-Programm für mehr Radverkehr

Ändern wir  
einfach ein  
paar Regeln!



Radfahrkompetente  
Kinder

Radfahren selbst  
verständlich machen

Moderne Fahrräder  
Österreich

Sichere komfortable  
Radwege Österreich

Vorrang  
Radverkehr



# Ein Fahrzeug für (fast) jede Lebenssituation





# **We Built It: Did They Come? Methods for Evaluating Interventions**

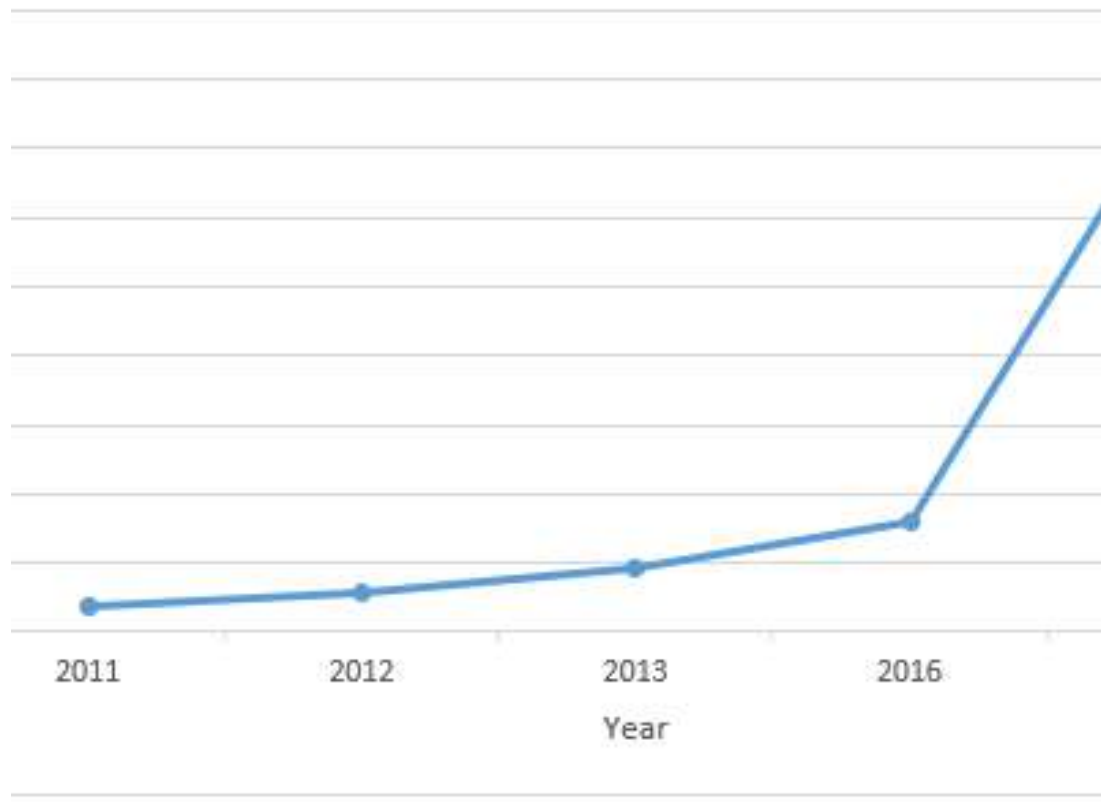
Dr. Rachel Aldred  
University of Westminster



## Talk content

- A method for evaluating large scale interventions: natural experiments
- A method for evaluating small scale interventions: intercept studies with count data





# The Causality Problem

- What caused the change?
- Would it have happened anyway?
- Was it really something we did? And if so, what?
- Would it work elsewhere?

# Natural Experiments



*A LONDON BOARD OF HEALTH HUNTING AFTER CASES LIKE CHOLERA*

## **Suburbs transformed for cyclists in £100m 'mini-Holland' revolution**

*10 March 2014*

All eight of the outer boroughs shortlisted for the "mini-Hollands" programme will win funding for substantial and transformative change, the Mayor Boris Johnson, announced today.

Three boroughs – Enfield, Kingston and Waltham Forest – have been selected for full mini- Holland status, receiving up to £30 million each for changes including:

# **Mini-Hollands: a perfect natural experiment?**





Pics: Joseph Croft (top), We Support Waltham Forest Mini-Holland (bottom)

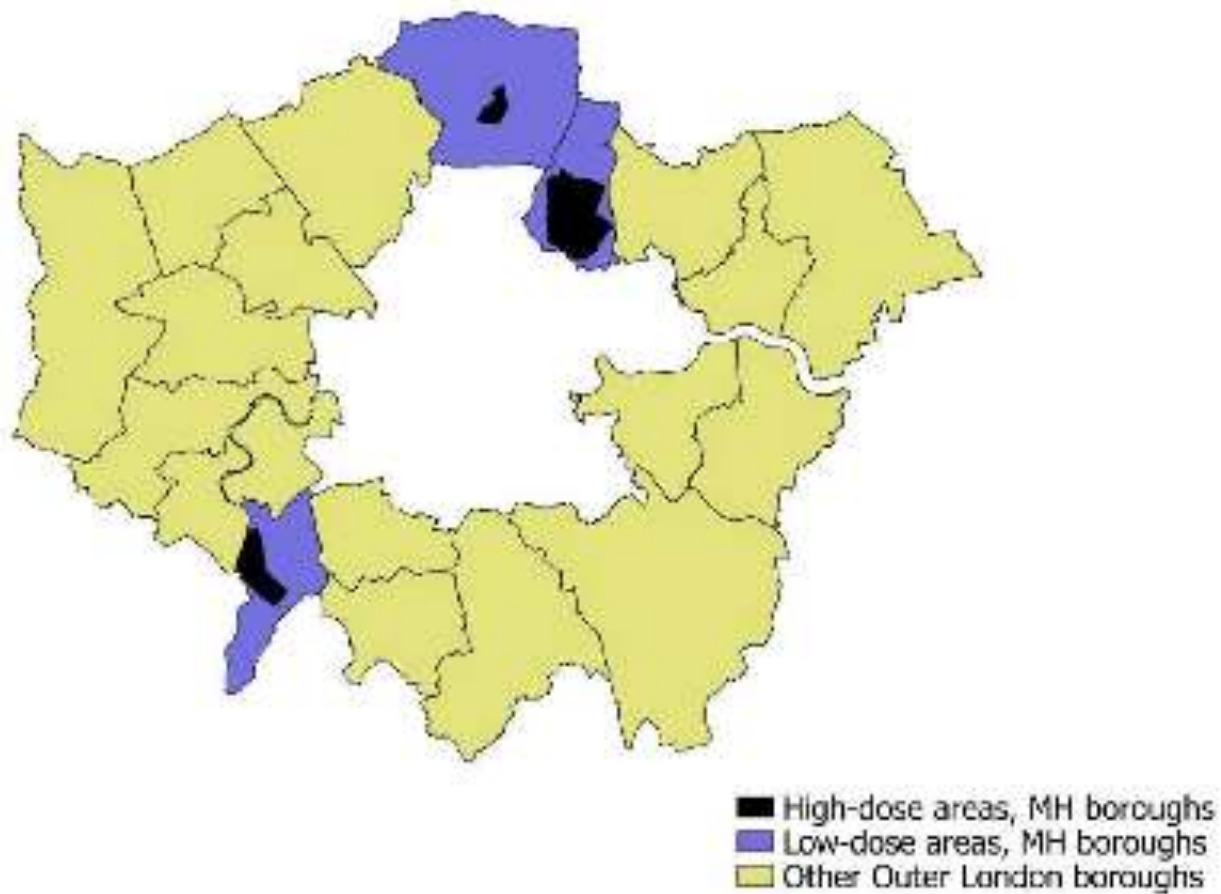




## The People and Places Survey

Uses a 'natural experiment' approach to examine whether and how proximity to mini-Holland interventions is associated with changes in travel behaviour and attitudes, and change in attitudes to the local environment.

- 3435 (baseline)/1712 (Wave 1) participants across Outer London
- Led by Westminster University & funded by TfL
- Paper published in TRA co-authored with Anna Goodman & Joseph Croft
- Online longitudinal survey
  - Baseline May-June 2016
  - Wave 1 May-June 2017
  - Wave 2 just finished (May-June 2018)
  - Continues until 2019-2021 TBC



**Low & high-dose areas (May 2017)**





# Survey Questions

Travel diary core in measuring behaviour change, but series of questions on related topics





# Perceptions of local environment

Cycling is unsafe because of the traffic

My local area is safe for an 8-year-old child to cycle

There are special lanes, routes or paths for cycling

My local area is pleasant for cycling

Walking is unsafe because of the traffic

My local area is safe an 8-year-old child to walk alone

My local area is pleasant for walking

There are good quality pavements for walking

There are enough safe places to cross roads

My local area has enough places to stop and rest outdoors

The area has enough shade or shelter from the weather

There are places to walk to, such as shops, restaurants, leisure facilities

The area is unsafe because of the level of crime or antisocial behaviour

Air pollution caused by motor traffic is a problem in my area



The Wave 1 results suggest consistent evidence of an increase in active travel in mini-Holland areas, particularly for 'high-dose' areas, relative to the control group.

This included evidence of more time spent in active travel (walking + cycling) and increased participation in cycling.



People living closer to interventions also showed an improvement in perceptions of local environment, relative to the control group.

**Headline Findings: behaviour change and travel attitudes**



**Intercept surveys combined with count data**





## Low-cost method, suitable for low- cost changes

- Much lower cost, but much less rigorous
- Adds value to existing data and can be used to build up an evidence bank.

## The problem with count data alone



- Many schemes include before-and-after pedestrian and cycle counts as routine
- Yet we don't know whether 'extra' walkers or cyclists are 'really' new (new trip/mode shift) or diverting/changing destination.
- This matters for estimating health benefits: health benefits only come from additional km walked or cycled.
- Ideally we would often like more walking and cycling to come from car travel (greater co-benefits).

# Combining count and intercept data

---

An intercept survey can be used to ask pedestrians and cyclists what difference the intervention has made to their trip.

---

This can then be used to correct the count data, using the proportion of 'really' new trips estimated from the intercept surveys.

---

We can then use a tool like HEAT or WebTAG to estimate the health economic benefit due to those new trips.

---

The intercept survey can also be used to ask questions about perceptions of the changes.



# Key findings



Around a third (30-31%) of additional pedestrians and cyclists recorded post-intervention were 'new'



With count data we then estimated 131-148 new walking and cycling trips daily due to the scheme



Using WebTAG we estimated a 20-year health economic benefit of £250,000-£1,000,000 (the physical measures cost c. £10,000).



The intercept survey also found removing through motor traffic leads to a large perceived improvement in street environment quality



# **We Built It: Did They Come? Methods for Evaluating Interventions**

Dr. Rachel Aldred  
University of Westminster





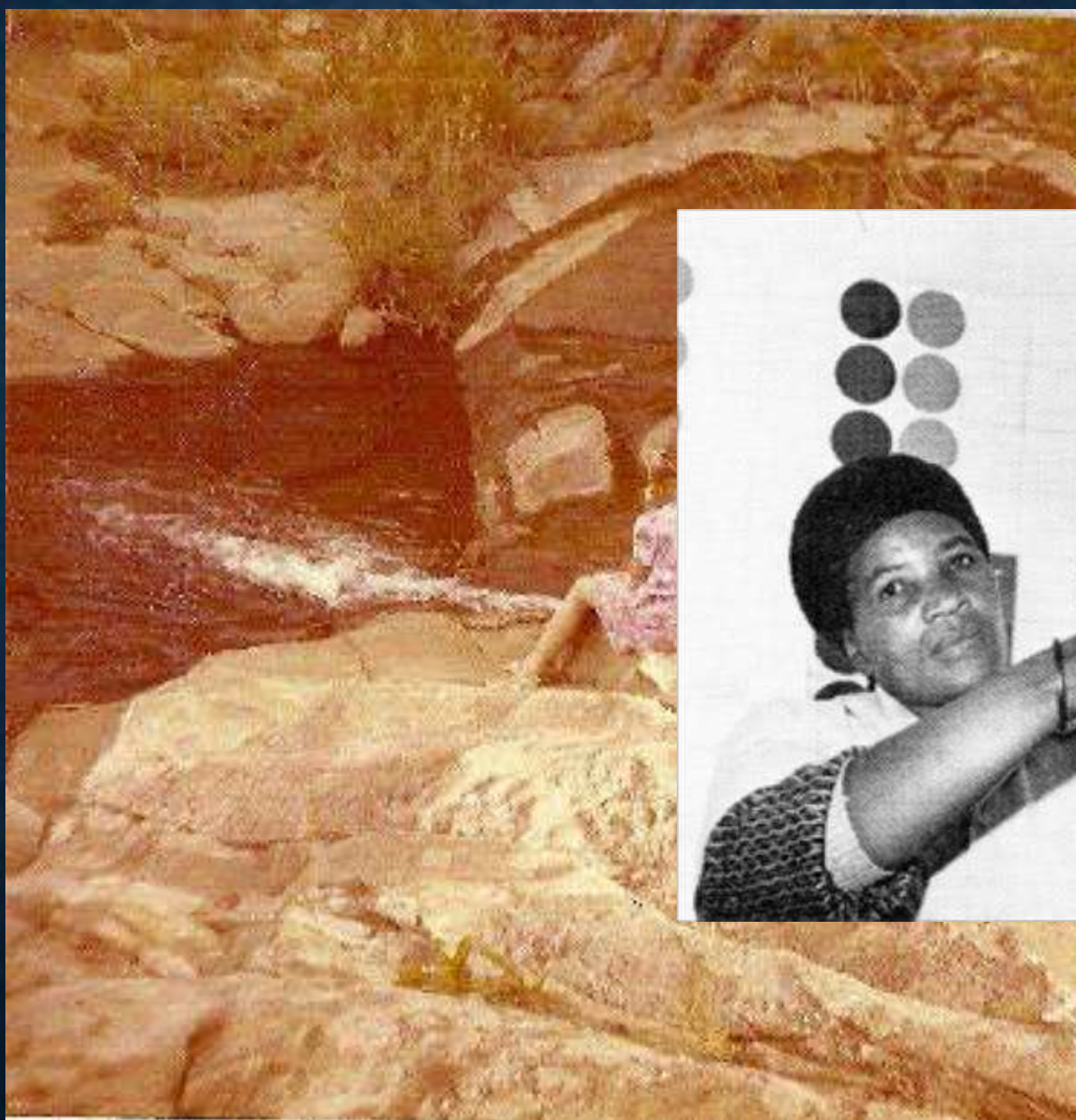
# **IT'S GOOD TO BE THE KING**

A Social Dominance perspective on the cycling experience















4%



# SOCIAL DOMINANCE THEORY (SDT)

“SDT begins with the basic observation that all human societies tend to be structured as systems of *group-based social hierarchies*. At the very minimum, this hierarchical social structure consists of one or a small number of dominant and hegemonic groups at the top and one or a number of subordinate groups at the bottom.”



Sidanius and Pratto, 1999, p. 31

# HYPOTHESIS

- The **roads network** is a **social system**.
- **Road users** are a stratified, hierarchical order of **social groups**.
- **Drivers** are a **dominant** social group, and **cyclists** are a **subordinate**, deviant, minority outgroup.
- This social dynamic leads to perceived and actual **danger** to cyclists, and to **poor cycling uptake**.





# DOES THE THEORY FIT?

## CHARACTERISTICS OF A SOCIAL SYSTEM

T.B. BOTTOMORE, 1962  
P. 111 – 112

- System of Communication
- Economic system dealing with the production and allocation of goods





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- Arrangements for the socialisation of new generations



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## CHARACTERISTICS OF A SOCIAL SYSTEM

**T.B. BOTTOMORE, 1962**  
**P. 111 – 112**

- System of Communication
- Economic system dealing with the production and allocation of goods
- Arrangements for the socialisation of new generations
- A system of authority and of distribution of power





# DOES THE THEORY FIT?

## CHARACTERISTICS OF A DOMINANT SOCIAL GROUP

**SIDANIUS AND PRATTO, 1999**

- Disproportionate possession of social value



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- Disproportionate possession of social value
- Preferential treatment





# DOES THE THEORY FIT?

## CHARACTERISTICS OF A DOMINANT SOCIAL GROUP

SIDANIUS AND PRATTO, 1999

- Disproportionate possession of social value
- Preferential treatment
- **Tendency to hostility and war**

(Sumner, 1906; Chrissochoou, 2004)

(Walker, 2017; Heesch et al, 2011;  
Kaplan and Prato, 2016)





# TESTING THE HYPOTHESIS

## MEDIA ANALYSIS

- Drivers:
  - Representation
  - Legitimation



# TESTING THE HYPOTHESIS

## MEDIA ANALYSIS

- Drivers:
  - Representation
  - Legitimation
- Cyclists:
  - Stereotyping
  - Dehumanisation
  - Cultural Violence





What are we to do?

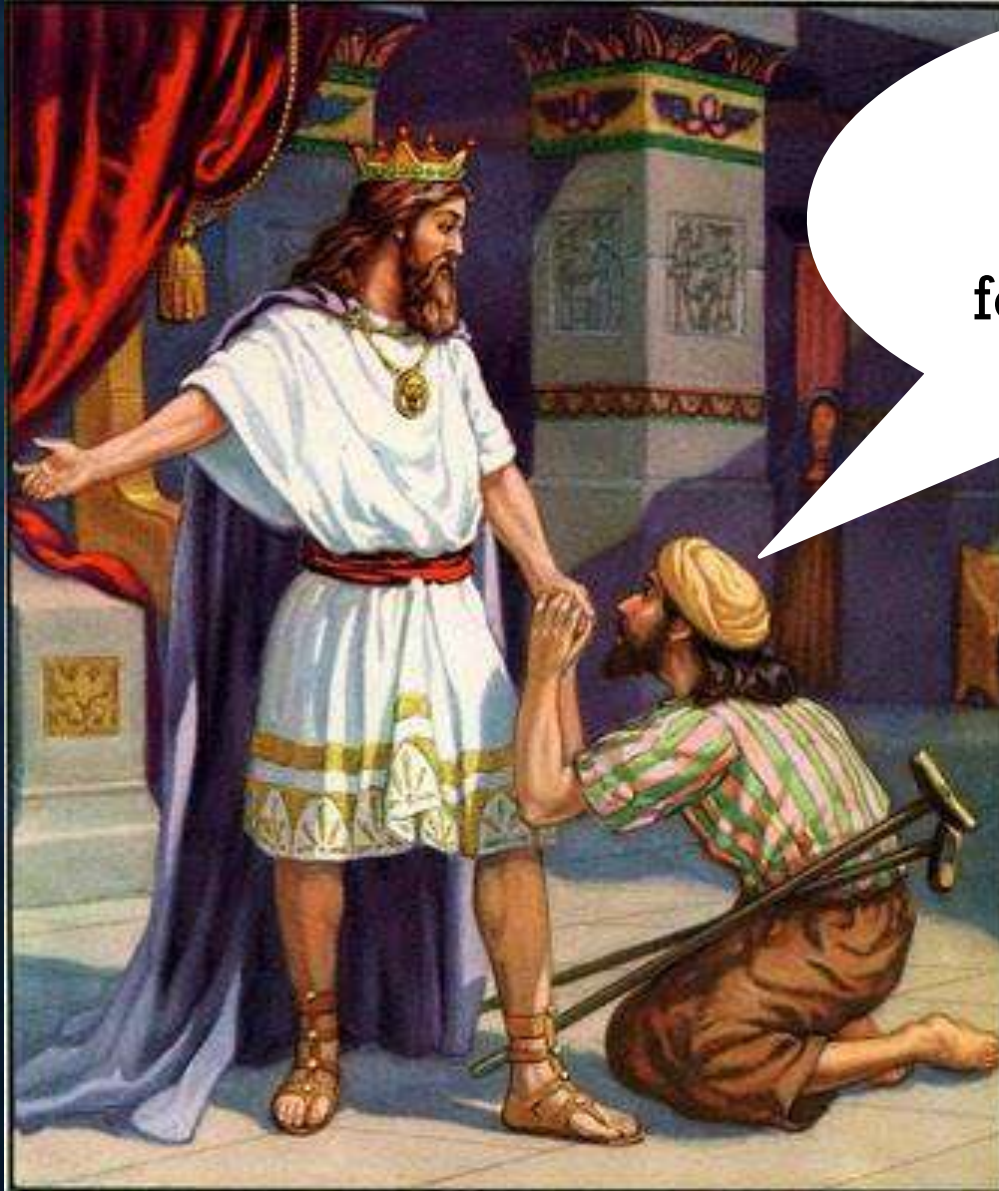




# UNDERSTAND AND CONTROL DRIVER DOMINANCE AND ENTITLEMENT







But cycling is  
healthy, and good  
for the environment!



# **GIVE CYCLISTS PHYSICAL AND PSYCHOLOGICAL PROTECTION**













Abdicate





# REFERENCES

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Recommended for a glimpse of the petty ways in which suffering was inflicted on people of colour in SA:

- Sowetan Live, *Recalling life under apartheid in SA*, 10 December 2013

# IMAGE CREDITS

- Robin Hood Men in Tights
- Sowetan Live
- Simone Acquaroli
- Federation of Associations in Behavioral & Brain Sciences; Connecticut University
- Goa Police
- Road Safety Authority Ireland
- John Chivall
- Sarah Kurfess
- Pawel Czerwiński
- Aaron Burden
- Mpho Mojapelo
- Rhys Moulit
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