Cycling and Society Symposium in Newcastle
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“Innovations in Cycling. Adaption and appropriation of Pedelecs.”

Dipl.-Geogr. Jessica Le Bris
Institute for Human Geography, Eberhard Karls Universität Tübingen / Germany
Doctoral Research Group mobil.LAB, Technische Universität München / Germany
„Sustainable Mobility in the Metropolitan Region of Munich“
1. Topic and motivation of the Ph.D. Project
E-Bike
- “like a motor bike”
- No own physical action needed
- has to follow same “street rules” like a moped
- 3000-5000€

PEDELEC [according to the EU Directive]
- “Pedal ELEctric Cycle”
- 1500€
- requires the rider to pedal in order to activate the motor
- Battery reach: 80km
- By EU law = bicycle
- 25km/h (S-Pedelec 45km/h)
Original idea and motivation

→ Pedelecs as a new mobility option in the field of "sustainable" mobility solutions...

What is the "Mobility Story" of pedelec owners???

→ "Understanding " from the users’ perspective of pedelec owners
→ getting insights about the adaption process of the new technology
→ Derive recommendations for politics and economics to support the further diffusion of sustainable mobility options
"Sustainable product"?

- Economic and social perspective:
  - mobility for everyone, not exclusive
  - "affordable" (long term)

- Ecological perspective:
  - very less energy consumption ("with 50€ around the world!")
  - highly efficient in the field of local mobility
  - living quality / public space

→ No reasons any more NOT to ride a bicycle? (egg. topography, business dress, transport...)
## Literature Review: car substitution effects

<table>
<thead>
<tr>
<th>Exemplary empirical studies</th>
<th>Findings in regard to pedelec use and environmental effects</th>
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<tr>
<td>LAMY 2001</td>
<td>65% of the usual car commuters could imagine using an electric bike as transport mode for commuting to work (p.37)</td>
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<td>&quot;The tests demonstrated that e-bikes could become very popular and replace automobiles as a way to commute to work, particularly in warm weather.&quot; (p.43)</td>
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<td>BUWAL 2004</td>
<td>reduction of kilometres travelled with conventional motor vehicles (p. 13)</td>
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<td>substitution of trips with all vehicles took place in similar scale for kilometres travelled by bike, car, public transport (p. 9, 95)</td>
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<td>reduction of energy use and CO₂-, NOx- and PM10 emissions by 5% in households with electric bicycles (p.9, 109)</td>
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<td>from the environmental perspective the substitution of trips by bike or public transport can be mainly seen as zero-sum situation (p.17)</td>
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<td>E-TOUR</td>
<td>electric <strong>two-wheelers replaced about 30 % car travels</strong> (Go Pedelec 2012b, p.7)</td>
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<td>DRAGE / PRESSL, FGM AMOR 2010</td>
<td><strong>6 of 12 trips were substituted car trips.</strong> So in 1 week 1 tester avoided about 44km by car at the average.&quot; (p.11)</td>
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<td>&quot;Overall in august 20 testers cycled about 1500 km with Pedelecs (each tester 1 week). About half of 1500 km would have been driven by car. So Pedelecs encourage a model shift from cars to sustainable mobility.&quot; (p.2f)</td>
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<td>KAIROS gGmbH 2010</td>
<td><strong>35% of the pedelec trips were undertaken in substitution of a car trip</strong> (p.23)</td>
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<td><strong>21% have permanently changed their mobility behaviour from using the car to a more often use of the pedelec</strong> (p.24)</td>
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<td>the pedelec as an ideal alternative to the car in comparison to other transport modes (for daily mobility) (p.28)</td>
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<td>MADER 2011</td>
<td>43% state, that the pedelec replaced the car more often for short trips; 21% state they cycle more often again since the purchase of the pedelec (p.15)</td>
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<td><strong>electric bicycles substitute car trips, mainly car trips with a distance up to 10 km</strong> (p.16, 42)</td>
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2. Theoretical Background

→ *in the sense of theoretical sensitizing concepts*
1. Social Science perspective (Mobility and Mobilities Research)

2. (Sustainable) Consumption Research

3. Diffusions- and Innovation Research

4. Science, Technology and Innovation Studies („STS-Studies“)

Context of Sustainability
3. Guiding research questions

→ How to operationalize a „Mobility Story“???
Framework to analyse a „pedelec/mobility story“

PAST

Pedelec „Knowledge“

Perception

Buying decision process

Usage

Long-term Usage

Pedelec Purchase
The life before …
and the life after/ with the pedelec…
4. Methodology
Open research design

1. Explorative phase
talks to pedelec dealers and owners as well as non-users, project eE-Tour ALLGÄU (electric mobility in the ALLGÄU), City of Tübingen / Germany

2. Material access: acquisition of pedelec owners

Hotel incentive, German cyclists federation (ADFC), Extra Energy, Facebook, bicycle events/conventions, bicycle dealers, bicycle campaign Munich

3. Qualitative design: 40 interviews in the Metropolitan Region of Munich (rural + city)

→ understanding of the “Why“ and “How“, emotional, symbolic dimensions

4.+5…. Transcription, analyse/ hermeneutic circles and theoretical sampling

→ diversity and heterogeneity of the user (gender, age, residential location, mobility orientations)
E-Biker wanted!

Fahren Sie ein E-Bike oder Pedelec?
Gewinnen Sie ein Wellnesswochenende im Allgäu!

Die Universität Tübingen erforscht Akzeptanz und Nutzung elektromobiler Zweiräder als zentralen Bestandteil einer umweltfreundlichen und individuellen Mobilität.

Für das Gelingen des Projekts ist Ihre Meinung gefragt! Sie fördern damit wesentlich aktuelle Forschung in einer laufenden Doktorarbeit.

Möchten Sie das Forschungsprojekt unterstützen und Ihre Gewinnchance nutzen? Bitte wenden Sie sich an Jessica Le Bris!

Doktorandin
Dipl.-Geogr. Jessica Le Bris
Tel.: +49 (0) 7071-29-76295,
mobility-forschung@geographie.uni-tuebingen.de

Betreuung durch Prof. Dr. Rainer Rothfuß

www.hotel-sommer.de
www.geographie.uni-tuebingen.de
5. Findings
Findings from “constant comparison”

1) Mobility orientations and ‘biographical developments’:
   • Central theme: former “bike affinity” / experience
   • Diversity of (former) mobility practises and orientations

2) Influencing factors for purchase / trigger moments:
   • Change in biographical story / external factors
   • change of attitude, lifestyle
   • dissatisfaction about actual situation (car /bike)
   • general curiosity
   • Pedelec as object for identification and demonstration
3a) Mobility motivations & impacts
(intended & unintended consequences)

- new transport technology
- wish of being ACTIVE & joy of cycling

**EASE**
- substitution of a bike
  - save power (for other things)
  - speed up / save time (for other things)
  - equalize group / partner power differ.
  - equalize topography
  - equalize group / partner power differ.

**EXPAND**
- substitution of ind. motorized transport
  - raises cycling frequency
  - enlarge action radius
  - more transport capacity

**SUSTAIN**
- substitution of public transport
  - age
  - illness / disabilities

- additional cycling trips
  - avoids shift to the car!!!
### 3b) Impacts on mobility behaviour and use of muscle power

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<tr>
<th>motivation / impact</th>
<th>example</th>
<th>Use of muscle power</th>
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<tr>
<td>making cycling easier</td>
<td>Bicycle → Pedelec</td>
<td>saving of muscle power</td>
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<tr>
<td>getting further (action radius)</td>
<td>Bicycle 5 km → Pedelec 10km</td>
<td>equal muscle power</td>
</tr>
<tr>
<td>cycling in hilly areas (topography)</td>
<td>bicycle 100-300m altitude difference → Pedelec 500m altitude difference</td>
<td>equal muscle power</td>
</tr>
<tr>
<td>being faster / speed up</td>
<td>bicycle 30 min → Pedelec 20 min</td>
<td></td>
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<tr>
<td>MORE cycling, pedelec as substitute for other transport modes</td>
<td>bicycle / car / PT → pedelec</td>
<td>additional muscle power</td>
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→ Ho: Pedelecs enable (more) active mobility
→ Pedelec as technological upgrade of conventional biking / “tuning“, “boost your energy“
4) Adaption process and usage:
   - Diversity of users and usages, multifunctional transport mode

5) Technological modifications:
   - Technical ‘product optimization’: tuning up to 30km/h

6) Impacts on daily life:
   - new organization of daily life
   - social effects
   - new experiences and widening of possibilities
   - makes live easier, higher living quality

7) Appropriation:
   - high emotional meaning, object of identification, being proud, demonstration effects
   - practical meaning, organization of daily life not possible any more without the pedelec
Quotations for impacts on life (“consequences”)

• M: “Since I got the pedelec, life is **significantly easier**, you arrive relaxed and you are not sweaty any more and (..) at the end of the week, you got still energy for some other (sportive) activities.”

• V: “It is a great thing: during high traffic time I only need about 10 minutes more than going by car (..) I can take all these little hidden rat runs (.) I got my sports programme done while commuting (.) **In the end, I cancelled my membership at the fitness studio and in consequence, since I got the pedelec I have got more time for and with my wife.** “

• cc2: “It has changed my life. I am not using it on my daily way to work BUT it is a total new way of cycling in our free time. Today we are **doing bike tours that are much more ambitious** and we are cycling in areas we would have never gone by bike before - it is a possibility to **explore total new regions** by bike and still being independent from the car.
Limits / Constraints for further diffusion:

- In general high satisfaction with the product itself… but still lot of prejudices (from more aged people, too!!)
  → influence of cultural / social norms

- Wish for cyclist friendly infrastructure
  → influence of built environment

Some thoughts for discussion:

- Cycling and sports versus daily mobility!
  - Why is a technological upgrade seen as “cheating” or “not sportive”?

- Who has the “right” to ride a pedelec? Acceptance in society...
  - Is a motorcycle biker “un-cool”?
6. Conclusions and applications
### Ideas for promotion strategies

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<th>SOFT POLICIES / MEASURES</th>
<th>HARD POLICIES / MEASURES</th>
<th>TECHNICAL ASPECTS</th>
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<tbody>
<tr>
<td>Information and communication about the advantages &amp; diversity of usages</td>
<td>Pedelec friendly infrastructure (speed lanes, bike boxes…) NO demand for public charging stations!</td>
<td>Design</td>
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<td>Image marketing / marketing campaigns</td>
<td>Discussion about speed regulation: pedelecs up to 30km/h AND city speed limit down to 30km/h makes pedelecs as “equal vehicles on the road”</td>
<td>Technical improvements</td>
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<td>gaining new target groups for cycling!!</td>
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<td>Information on the real costs (less cheaper over time)</td>
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<td>Offering testing experiences</td>
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<td>Selling the fun and joy of cycling!!</td>
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**GENERAL BICYCLE PROMOTION STRATEGIES**
Thanks a lot for your feedback and comments!

Dipl. Geogr. Jessica Le Bris
Doctoral research group mobil.LAB (Hans-Böckler Foundation)
“Sustainable Mobility in the Metropolitan Region of Munich”
jessica.lebris@yahoo.com

First supervisor Prof. Dr. Rainer Rothfuß (Human geography and global studies, University of Tübingen)
Second supervisor Prof. Dr.- Ing. Wulfhorst (Technische Universität München, Institute of Transportation, Department of Urban Structure and Transport Planning)