



Cycling and Society Symposium in Newcastle
September 2014

**“Innovations in Cycling.
Adaption and appropriation of Pedelecs.“**

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„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*

Pedelecs ...



250 Wh

= "real world" electricity
per 33 km trip

Energy ...



10 Liters * 25 Wh = 250 Wh

= water consumption
per shower
= energy required to
heat 1 liter from 15 to
40 degree Celsius

Effizienz - Die Effizienteste Form der Fortbewegung die je erfunden wurde.

“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*
- *substitute for car trips (see BUWAL 2004, MADER / MADER 2011, REITER/PRESSL 2009, HAEFELI 2008, STRELE 2010)*
- *living quality / public space*

→ No reasons any more *NOT* to ride a bicycle?
(egg. topography, business dress, transport...)



Literature Review: car substitution effects

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

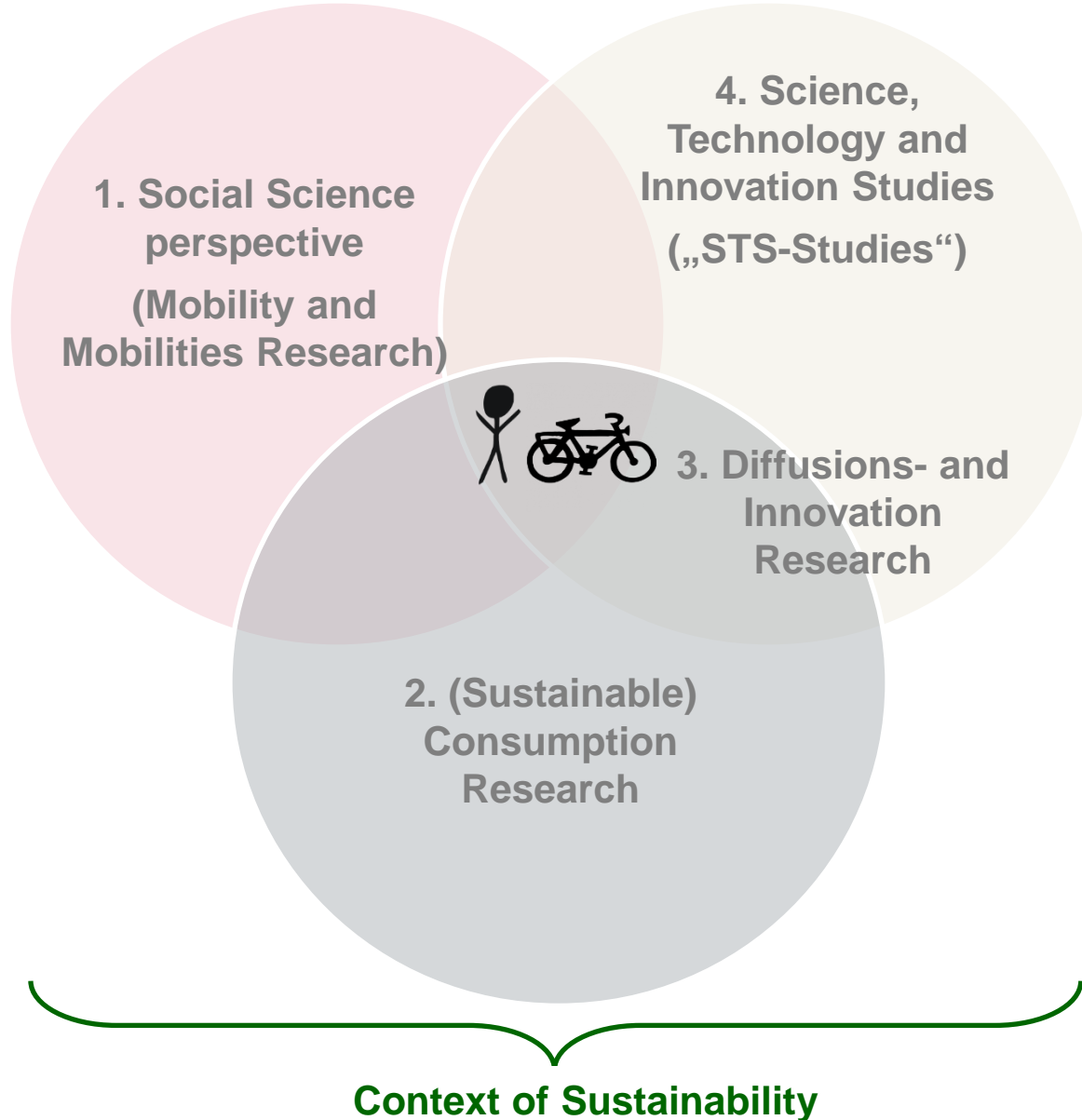


2. Theoretical Background

→ in the sense of theoretical sensitizing concepts



Theoretical heuristics



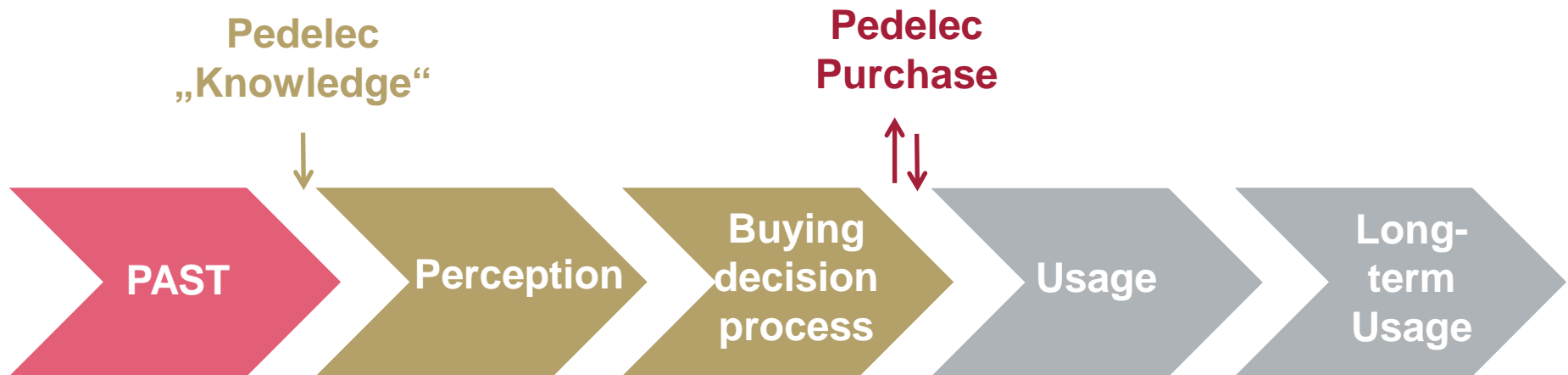


3. Guiding research questions

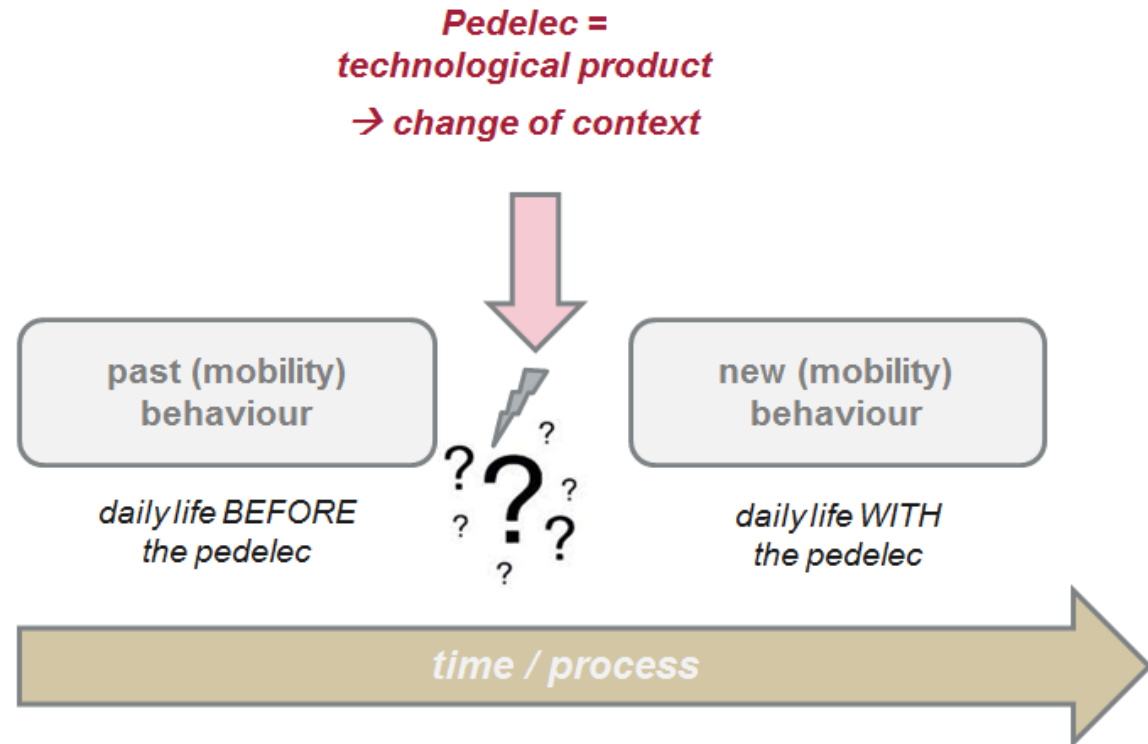
→ How to operationalize a „Mobility Story“???



Framework to analyse a „pedelec/mobility story“



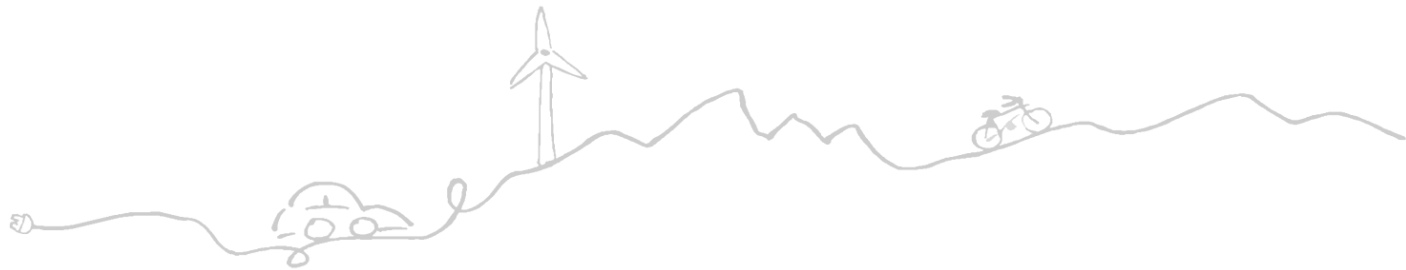
... “in short“



*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

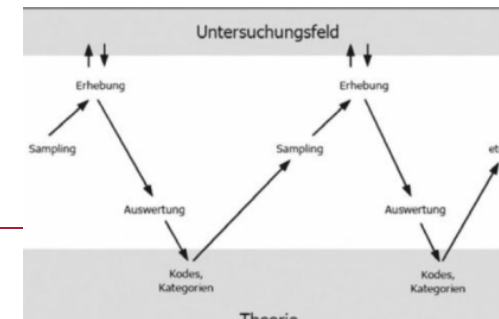
Hotel incentive, German cyclists federation (ADFC), Extra Energy, Facebook, bicycle events/conventions, bicycle dealers, bicycle campaign Munich

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!

EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN



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!

Unter allen Befragungsteilnehmern wird ein Wochenende für zwei Personen im **4 Sterne Wellnesshotel Sommer** in Füssen/Bayern verlost!



www.hotel-sommer.de



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5. Findings



Findings from “constant comparison”

1) Mobility orientations and ‘biographical developments’:

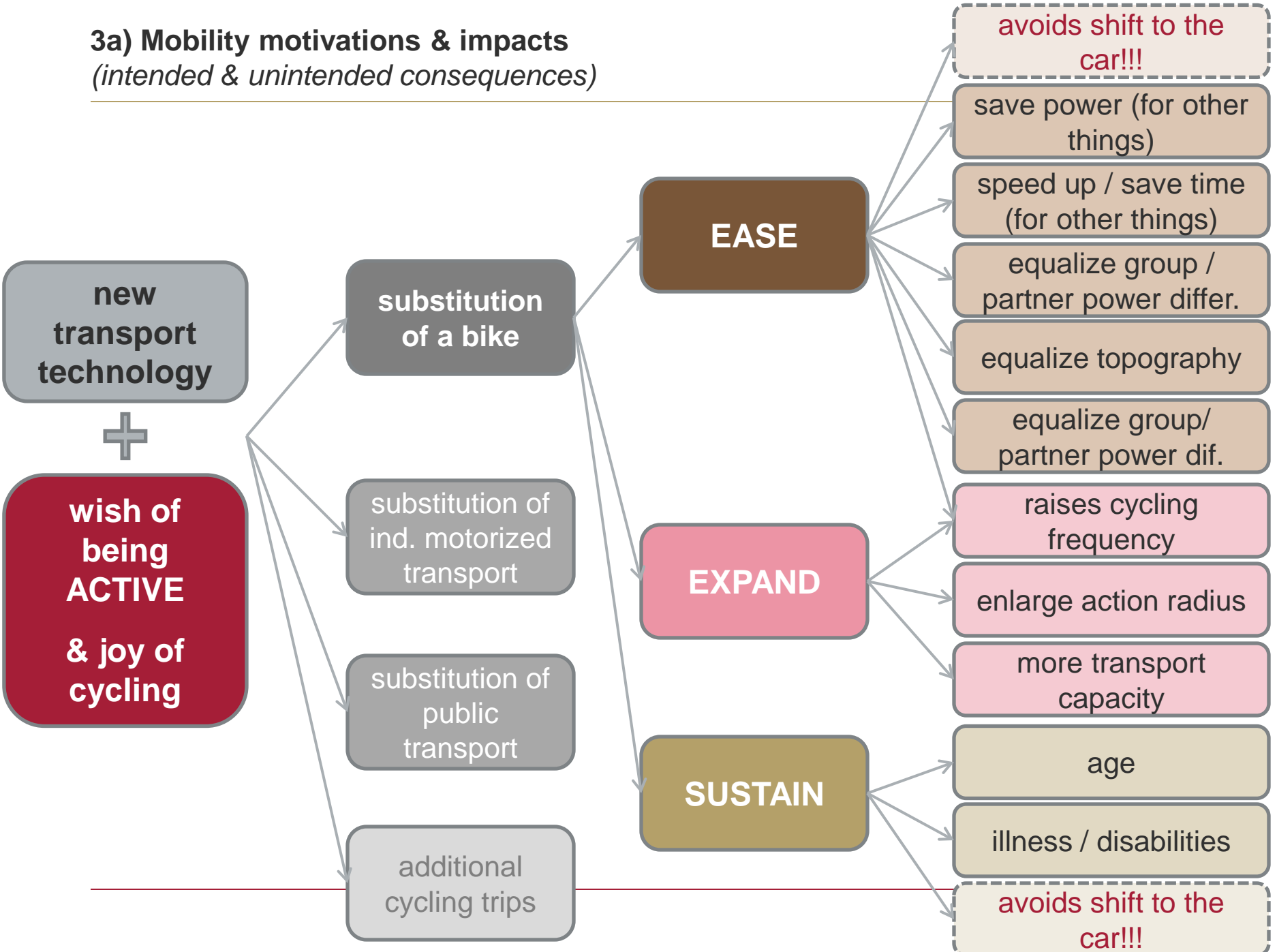
- Central theme: former “bike affinity” / experience
- Diversity of (former) mobility practises and orientations

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)*



Findings from constant comparison

3b) Impacts on mobility behaviour and use of muscle power

motivation / impact	example	Use of muscle power
making cycling easier	Bicycle → Pedelec	saving of muscle power 
getting further (action radius)	Bicycle 5 km → Pedelec 10km	equal muscle power 
cycling in hilly areas (topography)	bicycle 100-300m altitude difference → Pedelec 500m altitude difference	
being faster / speed up	bicycle 30 min → Pedelec 20 min	
MORE cycling, pedelec as substitute for other transport modes	bicycle / car / PT → pedelec	additional muscle power 

→ *Ho: Pedelecs enable (more) active mobility*

→ *Pedelec as technological upgrade of conventional biking / “tuning“, “boost your energy“*

Findings from constant comparison

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

SOFT POLICIES / MEASURES

- Information and communication about the advantages & diversity of usages
- Image marketing / marketing campaigns
- gaining new target groups for cycling!!
- Information on the real costs (less cheaper over time)
- Offering testing experiences
- Selling the fun and joy of cycling!!!

HARD POLICIES / MEASURES

- Pedelec friendly infrastructure (speed lanes, bike boxes...)
NO demand for public charging stations!
- 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“
- Support from companies „biking to work“ / green power providers / governmental support / subsidies

TECHNICAL ASPECTS

- Design
- Technical improvements

GENERAL BICYLCE PROMOTION STRATEGIES

Thanks a lot for your feedback and comments!



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