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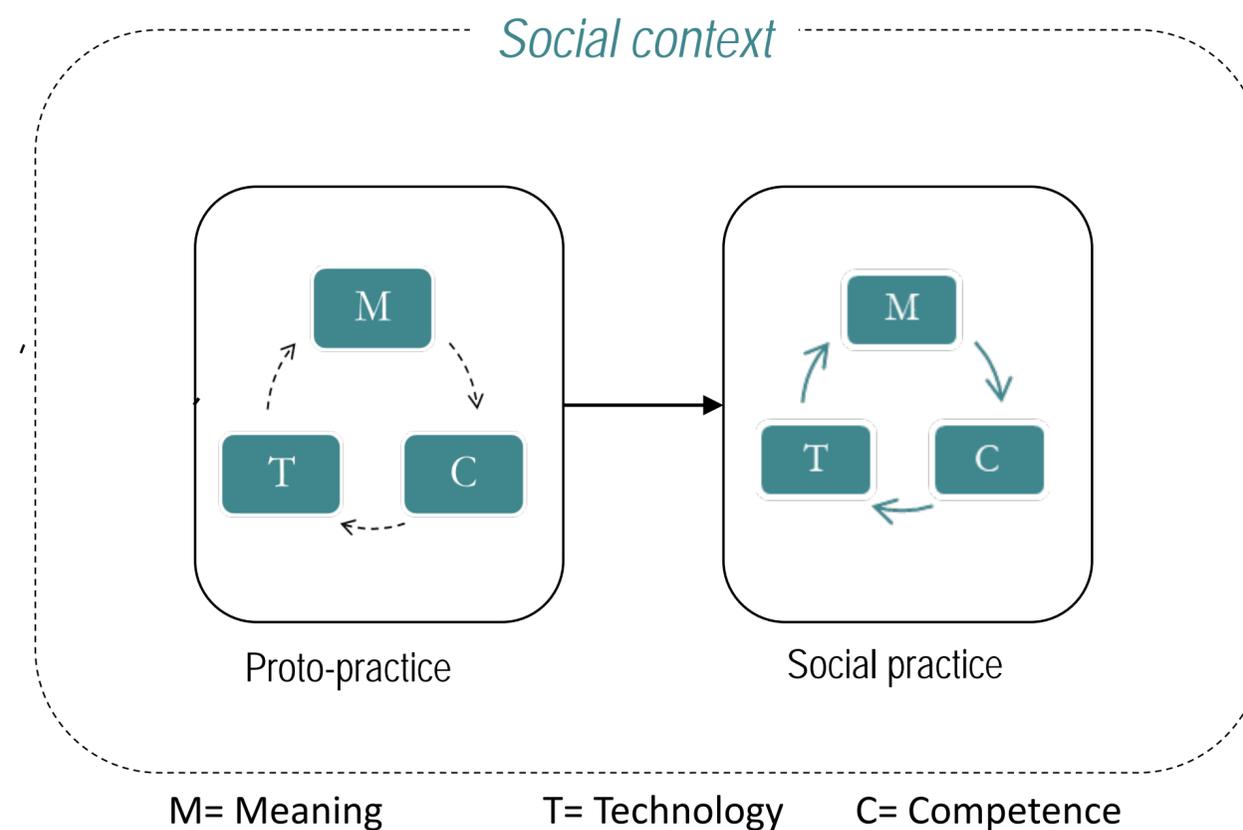
Car sharing and transformations in households' travel patterns: An outline of emerging proto-practices

TEMPEST seminar, November 2019

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Car sharing as emerging «proto practices»

- Car sharing represents an important **niche activity** that may cause transformations in the current socio-technical mobility regime
- A growing number of households are experimenting with use of shared cars, but still at a low level
- To take hold, car sharing need to be established as a **social practice**:
 - Routinized action that include interlinked elements of meaning, competence and technology.
- Car sharing is still at an early stage, but different types of **proto-practices** can be observed:
 - Emerging social practices where the links between the elements of meaning, materiality and competence have not yet been made stable, or are lacking
- Research questions:
 - What are the emerging mobility practices in households, based on shared cars?
 - What are the implication of this for the development of car sharing in the future?



A mixed method approach to define car sharing practices in the Oslo region

- A **web-based survey** was distributed by the service providers to all their members.
 - Passive users were excluded, giving a net sample of 1,136 active users.
 - Aspects of meaning, learning and competence were analyzed related to the daily use of the cars
 - To locate and define social practice areas, an exploratory factor analysis (PCA) and a cluster analysis were used.
- **Qualitative interviews** with 36 households were conducted to explore the social practice dynamics
 - Users of “Hertz Carpool” (B2C), “Car Collective” (Coop) or “Neighbor Cars” (P2P)
 - Different types of households in Oslo
 - In-depth interviews in the homes of the families

	Active	Passive *	Total
Car Collective (Coop)	785	187	972
Hertz Carpool (B2C)	149	91	240
Neighbor Car (P2P)	202	765	967
	1,136	1,043	2,179

Table 1: Survey data overview of car sharers, active and passive users.

Household types	Number
Single	2
Single with children	5
Couple with small children	15
Couple without children	14
Total	36

Table 2. Qualitative data overview.

Research design following three stages

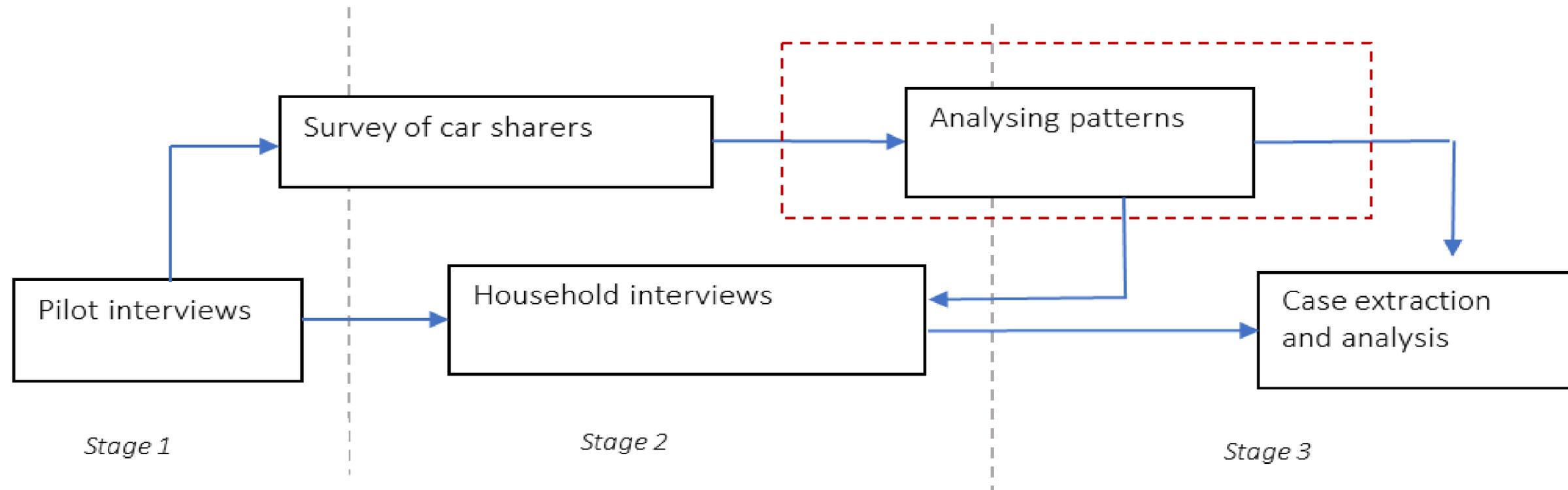


Figure 1. Analysis of data

Survey results

Different meaning associated with sharing cars

- A battery of statements used to capture the «meaning» of car sharing.
- A factor analysis (PCA) suggests three key dimensions of meaning among the car sharers: **Environment**, **Utility** and **Economy**
- These dimensions were included in a (two-step) cluster analysis together with variables describing the everyday car-sharing activities
- Gives an outline of three «proto practices» for use of car sharing in Oslo

	Environment	Utility	Economy
Car sharing fits my identity	0.701		
I want more environmentally friendly travel	0.730		
Car sharing is social	0.745		
I like the idea of car sharing	0.507		0.424
Car sharing gives me more freedom of choice		0.821	
Car sharing is more practical than owning a car		0.811	
Car sharing reduces my transport costs			0.931

Table. Factor loadings, rotated (Varimax) and sorted component matrix

Survey results

An outline of three car sharing proto-practices

- **Active green**
 - Mainly Coop car sharing
 - Holiday, shopping and leisure trips
 - Moderate distance
 - Fewer additional trips with cars
 - Environmental motivation
- **Local flexible**
 - Mainly Coop and/or B2C car sharing
 - Different types of trips, but shopping and work are most important
 - Mostly shorter trips in the urban region
 - Utility aspects have some importance
- **Long distance holiday**
 - Mainly P2P car sharing
 - Mostly holiday and shopping
 - Longer trips over longer duration of the sharing
 - Economic aspects have some importance

	Clusters		
	Active green	Local Flexible	Long distance holiday
Size	43.1% (490)	33.8% (384)	23.1% (262)
<i>Type</i>			
Coop	***	**	*
B2C		**	*
P2P		*	***
<i>Trips with shared cars</i>			
Holiday & weekend	***	*	***
Leisure trips	**	*	*
Shopping (heavy goods)	***	**	**
Work related	*	**	
Various purposes		*	
Pick up/drop off children		*	
<i>Use of shared cars</i>			
Frequency of use	**	**	*
Duration of last share, days mean	1.7	1.2	2.9
Distance last share, km mean	156	78	315
<i>Use of other transport</i>			
Car	*	**	**
Public transport	*	*	*
Bicycle	*	*	
<i>Meaning</i>			
Environment	***		
Economy	*		*
Utility	*		

Survey results

The three groups have developed different patterns of car sharing use

- **Active green**: More children, more females, rarely access to other cars in household
- **Long distance holiday**: More often living without children; more men, more often access to other car (s); younger
- **Local flexible**: in-between the AG and LDH practices

	Active green	Local Flexible	Long distance holiday
Children in household***	51.2	43	34.4
Gender (female)***	42.9	35.4	30.2
Access to additional car***	4.5	17.4	22.5
Age (M)***	40	42	38

Table 7. Cluster membership and demographic characteristics, percent. *** Sig. < 0.001

Case studies of households

“We obviously use a car much less now, so it actually leaves us better off, like in terms of the environment, than when we had a car ourselves. When driving a lot in the city center, it doesn’t really feel right – with air quality and such things.”



AG household: married couple in their late thirties with two children. Bought a larger car when they had their first child. However, after a while they chose to sell the car, because they realized they did not really need it. Joined Coop

“I was going out of town in connection with a meeting with the director there. My partner had the car, since she needed the car that day. So I needed a car then, and a colleague told me about some car pool. So I just looked at it a little, and it seemed like a very sensible concept....”



LF household: A couple in their mid-thirties. After a change in work location they sold their second car. Use now B2C car-sharing scheme as a supplement to the car in the other household. Have a carpool station just two minutes away across the street, and use shared cars mostly for short trips in the region, and work-related travels

“In my job, no two weeks are hardly ever alike, travel, meetings here and there. So we have to plan a little, for instance since we’re going on a small ski trip next week. The apartment we’re staying in is rented through Airbnb, and is a part of a big house. The big car I have hired for this trip is from Nabobil [P2P].”



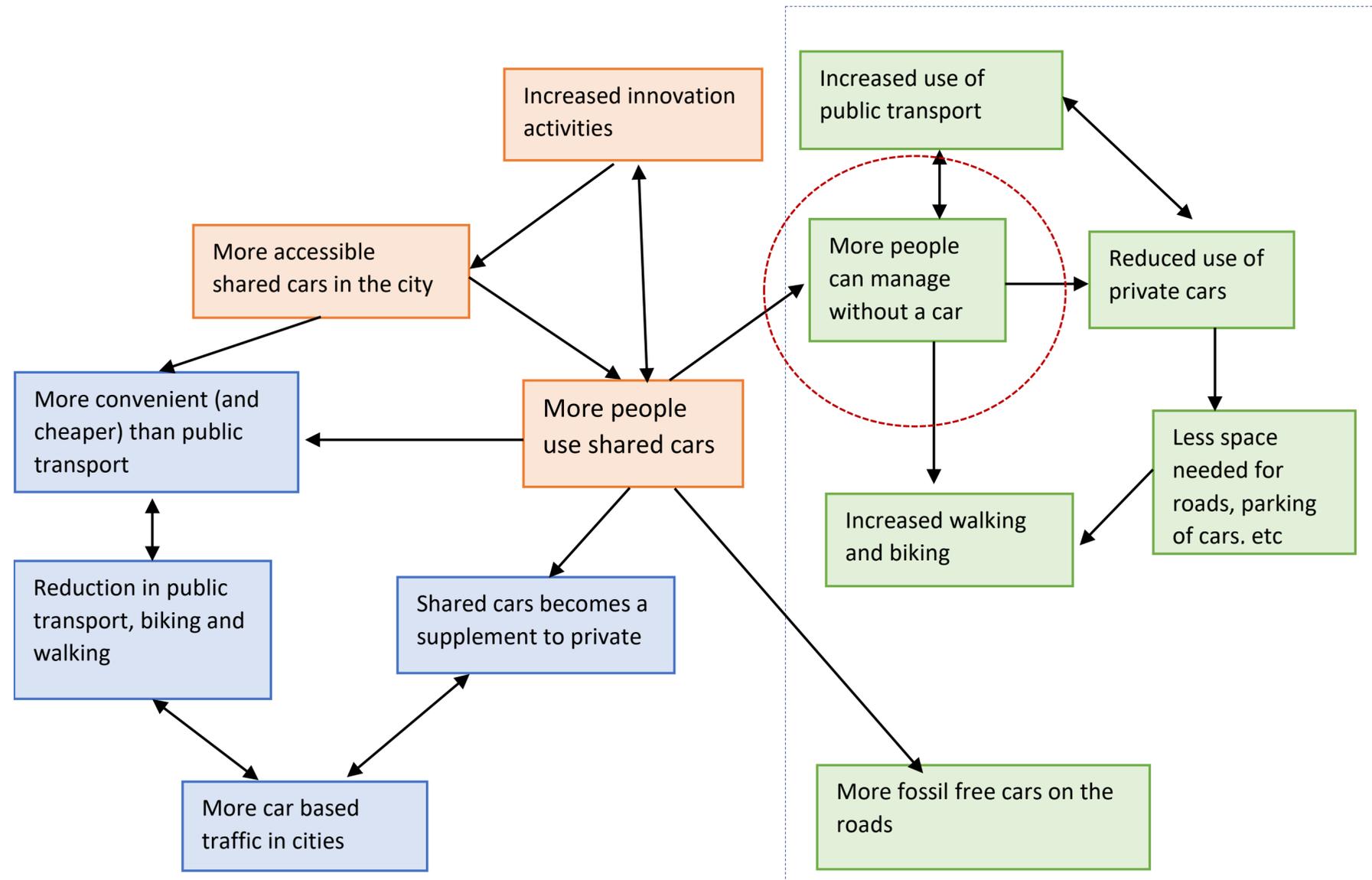
LDH Household: A couple in their early-thirties with two small children, who live in a centrally located in Oslo. They owned a car earlier, but sold it about six months prior to the interview, right before their second child was born. They started out using BTC, but changed to P2P as more and more peer cars became available. Use shared cars frequently for holidays and weekend trips

What are the implications for development of more sustainable urban travels?

- The three proto-practices may over time crystalize into more stable routines when they take hold among a larger groups of people.
- Growth in *Active green* practices is most likely to be part of radical changes in current transport regimes, since this involves a conscious rejection of ownership. Will have a clear environmental benefits
- Growth in *Local flexible practices* can mean that more household can manage without a 2nd car. However, it tends to involve shorter trips in the city region and may replace use of public transport, bikes and walks
- More *Long-distance holiday* can be positive since it involve trips mainly outside the city regions. Yet it tends to be used as a supplement to privately owned household cars. May also give younger people easier access to cars

Policy makers should be aware of the possibilities and risks involved with development of different car sharing practices. More should be done to implement policies that support the practices of using car sharing as replacements for ownership

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Survey results

Key differences across car sharing type

	P2P	Coop	B2C	Total
<i>Gender***</i>				
Female	32,2%	41.4%	23.5%	37.4%
Male	67.8%	58.6%	76.5%	62.6%
<i>Age***</i>				
< 30	33.2%	11.7%	20.1%	16.6%
30-50	52.5%	71.7%	60.4%	66.8%
50 <	14.4%	16.6%	19.5%	16.5%
<i>Children in household (< 18 years)***</i>				
Yes	30.7%	48.8%	40.9%	44.5%
No	69.3%	51.2%	59.1%	55.5%
<i>Distance to closest PT-stop*</i>				
Less than 500m	79.2%	79.5%	73.2%	78.6%
500-1000 m	17.8%	19.0%	21.5%	19.1%
More than 1000m	3.0%	1.5%	5.4%	2.3%
<i>Frequency of use***</i>				
More than once a week	2.0%	6.0%	5.4%	5.2%
More than once a month	8.4%	47.3%	41.6%	39.6%
3-6 times in last 6 months	89.6%	46.8%	53.0%	55.2%
<i>Position***</i>				
Full-time employed	85.1%	91.1%	90.6%	90.0%
Part-time employed	5.0%	6.8%	2.7%	5.9%
Student	5.9%	2.2%	5.4%	3.3%
Other	4.0%	0.0%	1.3%	0.9%

* $p < 0.05$ chi-sq. **** $p < 0.001$ chi-sq.