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Abstract

Over the last decades car sharing has been recognized as a socio-technical innovation that can help to reduce or replace the use of fossil-fueled private cars in urban regions. To understand how car sharing may be used in the future, and its potential role as a driver of a more sustainable mobility system, studies of early user practices represent an important source of knowledge. Based on a combination of inductive statistical techniques and qualitative investigations of car-sharing households in Oslo, this study explores emerging practices of car sharing. A survey of 1,136 active car sharers is combined with 36 in-depth interviews with households using three different car-sharing schemes. The results suggest that car sharing is developing as three different proto-practices, labeled as active green, local flexible and long-distance holiday. These three practice forms relate to variations in car-sharing schemes, type of travel, and length/frequency of trips, as well as to affiliated motives and meanings. The study contributes a deeper understanding of how current car-sharing practices are emerging in households and the potential implications for sustainable urban mobility and policy developments.

Keywords	Car sharing; practice theory; households; everyday mobility; households; mixed method
Manuscript category	Energy, consumption, and behavior

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

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1. Introduction – an innovation in the making

Today's urban regions are growing rapidly, and the need for more efficient and less polluting person transport is unquestionable in almost every part of the modern world. It is increasingly recognized that a mobility system based on privately owned, fossil-fuel-driven cars is unsustainable (Hodson, Geels and McMeekin 2017; Kemp, Geels and Dudley 2012; Schippl, Gudmundsson and Sørensen 2016). There is a growing interest in technological and social innovations that can help to reduce or replace the use of fossil-fueled private cars, and car sharing has emerged as a promising alternative. According to a number of empirical studies, car sharing has the potential to reduce road congestion, vehicle collisions, use of land for automobile infrastructure, vehicle emissions and energy consumption (Chen and Kockelman 2016; Cheyne and Imran 2016; Ferrero et al. 2018; Martin and Shaheen 2011; Shaheen, Schwartz and Wipyewski 2004). A further upscaling of car sharing in urban areas is expected to help tackle the highly inefficient vehicle use in cities and reduce the number of cars needed on the road to fulfill the same mobility needs.

As a presumably radical alternative to private ownership of vehicles, car sharing can act as a niche practice, capable of causing ruptures and transformations in the current socio-technical mobility regime dominated by the use of privately owned, fossil-fueled cars (Meelen, Frenken and Hobrink 2019; Nykvist and Whitmarsh 2008). According to socio-technical innovation perspectives, niches can facilitate transition to new mobility regimes when aligned with broader transformations on a landscape level (Geels and Raven 2006; Smith and Raven 2012). However, transformation towards a regime shift where cars are mainly de-privatized will depend not only on changes in available technologies, infrastructures, norms and institutions, but also on changes at the level of everyday mobility practices. Shared cars must find their place as an accepted and reliable transport mode in the everyday life of urban households. As argued by Watson: "changes in socio-technical systems only happen if the practices which embed those systems in the routines and rhythms of life change" (Watson 2012, p. 489).

A central finding in studies of technology adoption in households (and organizations) is that it requires sequences of experimentation, testing, adaptation and gradual acceptance and/or rejection (Bijker and Law 1992; Franke and Shah 2003; Røpke, Christensen and Jensen 2010; Silverstone and Haddon 1996). The introduction of new technologies enacts needs for collective learning, initiates discussions of their meaning and position in the household, and affects the quality and constellations of social relations. Empirical analysis of earlier household innovations like electricity (Gram-Hanssen 2008), bathroom facilities (Shove 2003), sports equipment (Pantzar and Shove 2010) and home computers (Røpke and Christensen 2012) have shown how they are interconnected with changes in a variety of routines and activities, where the technologies gradually find their place in the homes and minds of the users. This was also the case with the introduction of private cars, which created new transport habits that gradually outperformed other modes of transportation (Sheller and Urry 2000; Urry 2007). Car sharing is a new and potential competing mobility practice, but it cannot be expected to replace traditional cars from one day

to the next. In most cases, it will more likely be adopted step by step, in a process that is anything but linear or predictable. Although car sharing has been a part of urban life for several decades, it is still a socio-technical innovation dominated by innovators and early users. For most of the current users, it is still at a stage of experimentation and adaptation, and has not yet found a stable function (Julsrud and George 2019). To understand how car sharing may be used in the future, and its potential role as a driver of a more sustainable mobility system, studies of early user practices represent an important source of knowledge.

Given the key role of shared mobility in much literature on the future of urban mobility (Ferrero et al. 2018), surprisingly little is known about how it is used in the households and about the dynamics and mechanisms involved in such a transformation. In-depth studies of the implementation and use of car sharing in households, and its implications for everyday transport activities have remained scarce (Chatterjee et al. 2013; Ferrero et al. 2018). This paper will fill this gap, and raises the question of how the emerging use of shared cars is related to changes in households' mobility practices and to what extent shared cars are forming new routinized forms of use (i.e. social practices). Based on a study of car sharers relying on different systems for sharing, we will further discuss the ways that car sharing is involved in transformations of households' mobility practices, and how this has led to different constellations of car sharing activities. We suggest that car sharing, as it is used today, has evolved into three slightly different types of mobility practices involving different sets of activities. These practices are, however, currently at an early stage where their configurations are still "in the making", and we will use the term *proto-practices* to refer to them (Shove, Pantzar and Watson 2012). The extent to which these forms of practice are further upscaled and developed will have significant implications for whether car sharing will contribute to a transition to a sustainable urban mobility system.

In the following sections we will first briefly discuss car sharing as an emerging social practice (proto-practice) and how this relates to the affiliated concept of projects and lifestyles. We will then further explain the methodological approach applied and the qualitative and quantitative data used in our analysis. The empirical work is based on a mixed-method approach that aims to identify and analyze the use of car sharing in the greater urban region of Oslo, Norway. We will briefly outline the context of the study, before presenting the results from the survey and the qualitative investigation of car-sharing households. Based on the findings, we will then discuss how the three defined proto-practices may impact on changes in urban mobility, and how policy measures can be designed to support the further development, stabilization and harm-mitigation of these practices.

2. Car sharing as an emerging social practice

Although it does not represent a radically new technology, car sharing challenges the foundations of the current mobility system, which to a large extent is dominated by private ownership. A key feature of

organized car sharing is a decoupling of ownership and use of cars, where the individual "right of use" is replaced by collective access to cars. In contrast to informal sharing, it is based on membership in an organization or platform where cars can be rented and operated on a self-access basis for short- and medium-term use (George and Julsrud 2018; Truffer 2003).

Today, car sharing is a broad concept that covers multiple business models based on different relationships between the users and the organizing unit (platform owner). The main ones include business-to-consumer (B2C), which is the most traditional; business-to-business (B2B); and, since recently, peer-to-peer (P2P). However, there are also differences in the organizational forms involved, which can be classified as commercial, non-profit, and/or cooperative (Millard-Ball and Schipper 2011). For-profit companies such as Zipcar and Car2go have access to venture capital and the greatest incentive to expand. Non-profit service providers often have better access to funding from governments and foundations. The organizational forms have very different historical roots, with many of the earliest car-sharing initiatives having been cooperatives and non-profit, in particular in the Nordic countries. In larger European cities there is now a mix of different car-sharing forms available, offered by different commercial enterprises. The growth in car sharing over the last years is largely due to diffusion of mobile devices and Internet 2.0 applications. As compared with the B2C and B2B platforms, P2P car sharing platforms rely to a much greater extent on technological innovations, particularly those having to do with smartphones, mobile applications and internet access. Although a car-sharing company that owns its own fleet of vehicles could still exist without a web presence, all of them currently do have websites on which members can book vehicles.

Social practice theories have gained increased recognition as providing a framework for sustainability research and policy (Shove, Pantzar and Watson 2012; Spaargaren 2011; Warde 2005). Recently, it has been suggested as a useful approach to studying car sharing on a local level (Dowling and Kent 2015; Kent and Dowling 2013). In general, practice theories build on the central idea that to understand and explain social life, social practices should be the focus of attention rather than mental ideas, calculations or norms. Reckwitz (2002) has suggested that this is part of a wider stream of practice-oriented theoretical approaches in the social sciences, where the emphasis is on studying the emergent patterns of routinized behavior[1]. According to Reckwitz, practice theories involve the intertwined configurations of materials, competences, and cultural meanings. Practices are relatively routinized and sustained ways of enacting a set of elements, and everyday practices are anchored by multiple overlapping ties to the social, technical and cultural fabric of everyday life. Developing the concept of practice further, Shove et al. (2012) suggest that practices can be described as routinized actions that include interlinked elements of meaning, competence and materiality. In this context, materials are "things, technologies, tangible physical entities and the stuff of which objects are made", competences "skill, know-how and technique" and meanings

[1] Warde (2015), on the other hand, sees the stream practice approaches as a reaction to cultural theories.

"symbolic meanings, ideas and aspirations" (p. 14). Establishment of a practice involves the creating of links between new and pre-existing elements, so that these constitute each other and change through the process of integration (Shove et al. 2012, p. 42).

A social practice is something different than for instance "habits" or "routines", because it is a collectively produced behavior that needs to be continuously reproduced by people in a society. In contrast to traditional psychological and classical economic theories, social practice theories do not see the individual as capable of causing much change. As argued by Warde (2014), most people do not usually have control over the circumstances in which they find themselves, and change may come from endogenous forces rather than actors. "Exercise of individual agency as a source of social change should be considered a rare occurrence, a privilege of the powerful and a distant horizon even in the context of collective mobilisation" (Warde 2014, p. 295). Yet, at some point there is always a choice as to which social practices individuals want to attend to and get involved with, as well as how they are constituted by aspects of meaning, bodily involvement and performance. Sudden shifts in life situation or adoption of radical technological innovations can initiate shifts in the way social practices are performed or in which types of social practices that the individuals are engaged in. Most people are in a flux, taking up some social practices while abandoning others. In other situations, *new* practices need to be configurated involving elements of meaning, materiality and competence, for instance when new tools and technologies are entering households or enterprises.

One of the key challenges for practice theories has been how to explain where practices start and end, and how various practices are or are not interlinked. In general terms practices are described as "blocks of activities" that are performed together, such as serving a meal, washing clothes, etc. (Reckwitz 2002). The term complexes denotes practices that involve a situation of co-dependence and mutual dependencies, while bundles are practices that have looser connections, based on co-location and co-existence (Shove et al. 2012, p. 81). Sets of interconnected practices may on an individual level take the form of projects; goal-oriented complexes of practices necessary to realize an intention (Røpke and Christensen 2012). For instance, establishing a family or becoming a dog owner are projects that usually include and require several interconnected practices. Lifestyle is a somewhat looser term that is also used to explain how social practices are interconnected and the particular elements of meaning that are attached to them. According to Spaargaren (2011), lifestyle can be considered as something that initiates and integrates social practices, holding them together and connecting them through a common identity or meaning (Spaargaren 2011). On the level of individual actors, lifestyle can be described as the routinized manifestation of self-identity regulated by the project of self and influenced primarily by friends and the media (Jensen 2007). Lifestyle is the visual expression that differentiates one individual from another. Giddens (1991) sees lifestyle as an indicator of the "project of self", which has become more critical for individuals in late-modern society. As such it is also an area where individuals get involved with practices, guided by some general ideas of self-expression and identity.

How should car sharing be deconstructed as consisting of social practices? First it clearly rests on the preexisting practice of driving a private car. Using and driving shared cars is not, as such, a new practice. However it is infused with different types of (social) meaning and often involves new types of competence (using apps) and technology (different types of cars). Thus, car sharing represents an ongoing transformation of a preexisting practice (Julsrud and George 2019). Following the triadic conceptual framework offered by Shove and her colleagues, it largely represents a *proto-practice* – an emerging social practice where the links between the elements of meaning, materiality and competence have not yet been made stable, or are lacking altogether[2] (Shove et al. 2012, pp. 24–25). Yet, a practice exists both as an "entity" and a "performance", and it is through the performance that that the pattern provided by the practice as an entity is reproduced. The enactment of car-sharing practices involves the different practical ways that shared cars are used by groups of individuals in their everyday lives, possibly adhering to different lifestyles or projects. As for use of private cars, the sharing of cars includes variations in meanings and performances based on socio-demographic groups, life stage or geographic location (Uteng, Julsrud and George 2019). As we will show in the next sections of this paper, the current use of car sharing has moved in slightly different directions within the same urban region, forming different proto-practices.

3. Data and methods

3.1 Urban context

The target area of this study is Oslo and its greater metropolitan area. This is the most densely populated part of Norway, with more than one million people in Oslo and Akershus counties. The region has in the last decade also been a major destination for intra- and international migration, and is currently one of the fastest-growing urban areas in Northern Europe (OECD 2016). The first car-sharing organizations in Norway were established in the mid-1990s – a little less than a decade after the establishment of the first successful Swiss and German providers – and there are currently at least 10 providers of car-sharing services (George and Julsrud 2018). The preconditions for car sharing are good in this region, as it has the best public transport infrastructure in the country, and every third household is currently living without a private car (RVU/Urbanet 2018).

To explore some of the variety across types of car sharing, we include examples of three different types of car sharing in Oslo: Bilkollektivet, Hertz Carpool and Nabobil. These are also the largest car-sharing operators in the city. Bilkollektivet ("the car collective") is a member-owned cooperative that has over 150 stations in Oslo and a fleet of approximately 300 vehicles. Hertz Carpool is one of the largest

[2] Shove and colleagues describe this as a stage where no links are yet formed (ibid). We use the term a bit more loosely, to refer to a stage where preliminary links have been made and ad-hoc configurations of elements are being tried out.

commercial car-sharing companies with a fleet of over 150 vehicles, most of which are located in the Oslo metropolitan area. Nabobil ("neighbor car") is a peer-to-peer service that entered the market in 2017. Less than three years after its launch, Nabobil has more than 170,000 registered users and 5,500 vehicles in over 200 municipalities throughout Norway. In what follows, we will use the terms *Coop* for Bilkollektivet, *P2P* for Nabobil and *B2C* for Hertz Carpool.

3.2 Methodological approach

Our investigations are guided by a mixed-method approach, including a survey of car sharers as well as in-depth qualitative interviews with car-sharing households. A mixed-method approach is advantageous because it provides a better understanding of a particular field of interest by examining it in different ways (Cresswell 2003; Miles and Huberman 1994). We first used inductive quantitative techniques to explore and define main patterns of use (i.e. proto-practices), and then qualitative data analysis to investigate in more depth the car-sharing practices in the households.

First, a *web-based survey* was distributed by the service providers to all their members. The survey was distributed in November–December 2017, and 2,179 registered car sharers in the larger Oslo region were included. However, a significant number of the sharers were passive users, i.e. had not used the service in the last six months (Table 1). Since the key objective of this study was to address patterns of everyday use, the passive users were excluded, giving a net sample of 1,136 active users. Information about the actual population of car sharers in Oslo is not available, and it is therefore not known whether this sample is representative for car sharers in the region

[Table 1]

The survey collected information on issues capturing key dimensions of car sharing as a social practice, based on the framework suggested by Shove et al. (2012). Items addressing components of meaning, materiality and competence were included. To locate and define social practice areas, an exploratory factor analysis (PCA) and a cluster analysis were used. Clusters were constructed using a log-likelihood distance measure and Schwarz's Bayesian Criterion (BIC) to define the optimum number of clusters.

In parallel with the survey, qualitative *interviews with car-sharing households* were conducted. In all, 39 in-depth personal interviews of households were conducted in the Oslo urban region, of which 36 were used for further analysis. Households were interviewed in different districts, from the inner core of the city to districts some distance from the city center, covering both the central part, and the eastern and western edges of Oslo. The household sample was made up of different types of households: single households, couples without children, couples and singles with small children, and couples and singles with older children, as well as in a few cases a combination of two types of households (Table 2).

[Table 2]

The interviews were held in the respondents' residences and lasted about 60–90 minutes each. They covered a number of aspects related to the households' mobility practices related to car sharing, with a particular focus on social practice theory elements. The majority of the households were regular users of car-sharing services, i.e. had used a car-sharing service within the last year before the interviews, while a few were former users or irregular users who had not used the service within the last year. The interviews comprised households using "Hertz Carpool" (B2C), "Car Collective" (Coop) or "Neighbor Cars" (P2P), or in some instances a combination of two types of providers.

The combined analysis of the data followed three general steps (Figure 1). First a pilot study was conducted in eight households to test analytical tools and various techniques (not included in the sample). A revised version of the questionnaire was developed and used in the in-depth interviews. Insights from the pilot study were also fed into the questionnaire design used in the survey. In the second stage, all qualitative and quantitative data were gathered in parallel sequences. In the third stage, the data was analyzed. The quantitative data was used to explore overall patterns of use following social practice dimensions. These patterns were aligned with findings in the qualitative sample. A sample of three households is used in this paper to illustrate the social practice patterns and give a deeper understanding of them. Thus, the quantitative data is here used to structure the analysis of the qualitative data, which is used to elaborate the practice-based typology.

[Figure 1]

The combination of quantitative and qualitative data follows a logic where survey data is used to define groups that are then investigated in more detail and depth with qualitative data. By locating groups of people with similar types of car-sharing activities, constellations of "practice forms" were described. These practice forms are further discussed and described by the use of the qualitative data. Three household cases representing distinct groups will be displayed, although insights from all qualitative interviews are feeding in to the discussion and conclusions.

It is difficult to give full and complete descriptions of social practices using a quantitative approach, partly because the information is necessarily mediated by the informants who interpret and make sense of their own behavior in a particular way (Weick 1995). The dynamic nature of social practices, where sensemaking develops in close relationship with artifacts and bodily enactment cannot be captured. The strength of this approach, however, is that it allows for getting a descriptive overview of general structures, indicating social practices that can be further elaborated by qualitative data. As argued above, practices are routinized types of behavior that form natural groups or "blocks" of activities that are connected in time and space. To locate and define some of these behavioral forms, we analyze activities for which shared cars are used, seeing these as indicators of an emerging practice, i.e. a proto-practice.

Thus, what we look for are the different (routinized) ways of using the shared cars, to see whether they form practice types.[3] Our work here adds to a small but growing body of research on social practices that also uses quantitative methods (Mattioli, Anable and Vrotsou 2016; Southerton et al. 2012; Uteng, Julsrud and George 2019).

4. Results

The findings are reported for both the qualitative and the quantitative study. We start by describing findings from the inductive statistical analysis, and then describe the differences between them with support from the qualitative data.

4.1 Survey analysis

Table 3 shows key characteristics of the sample, differentiating between the three car-sharing schemes: "Neighbor Car" (P2P), "The Car Collective" (Coop) and "Hertz Carpool" (B2C). The sample consists of a majority of males, and this is the case for all types. This has also been found in earlier studies (Prieto, Baltas and Stan 2017). However, the average car sharers are middle aged (M = 40.1 years). Forty-five of the households have children below the age of 18, and there is a tendency for the families with children to prefer the traditional stationary forms (Coop and B2C) and for singles and couples to prefer the P2P type. Looking at the sharers' access to public services, there is relatively little variance between the three users, and all had (as expected) relatively good access to public transport. However, it should be noted that most of the sharers use the car sharing infrequently, with only 5% using it more than once a week. The Coop members are the most active users, and they also have the highest proportion of employed users and the smallest proportion of students.

[Table 3, Table 4, Figure 2]

We were interested in the meanings that car sharing had for the users and their motives for joining the car-sharing enterprise/community. Table 4 indicates the items used. All statements were evaluated on a 7-point Likert-scale. We also asked about the purposes of the trips that they usually took with the shared cars. As shown in Figure 2, the shared cars were rarely used for everyday trips to work, school or the

[3] This is very similar to the approach used by Mattioli et al. (2016) who use intensities of travel activities to inform social practices related to use of private cars.

grocery store. Instead holiday and weekend trips, as well as leisure trips and shopping for heavy goods were prevalent.

To investigate the general meaning structures underlying use of car sharing, an orthogonal principal component analysis was conducted using Varimax rotation. Bartlett's test of sphericity is significant (sig = 0.000), confirming that all correlations are different from zero and the data is suitable for PCA. The Kaiser-Meyer-Olkin measure of sampling adequacy is above 0.50, which indicates that the data is useful for further analysis (KMO = 0.778). Three factors cumulatively explained 65.2% of the variation, and adding more components only improved explained variance to a limited degree. Table 5 presents the rotated component matrix, sorted by size.

The first and strongest component contains five variables related to strong attachment to the idea of car sharing and its potential positive effects on the environment and social relations. There is also an aspect of identification as a car sharer in this group. We use the label *Environment* for this component. The second component included has high scores on three variables related to the freedom afforded by using shared cars and car sharing's value as a practical alternative to owning. We use the label *Utility* to describe this dimension. The third component includes a strong emphasis on the economic value of sharing, and also attraction to the idea of sharing itself. We use *Economy* as a short-hand label for this dimension.

[Table 5]

The meaning components from the factor analysis were included in a cluster analysis together with variables describing car-sharing activities. Cluster analysis is a family of techniques that sorts cases into groups of similar cases (Byrne and Uprichard 2012; Mooi and Sarstedt 2011). As input to our cluster analysis we used 17 of our variables. The three types of car sharing represent different aspects of the materiality as well as the necessary competence, in addition to the meaning components. To capture the routinized behavior, we used a set of activity-oriented variables.

A two-step cluster analysis was applied due to its capacity to handle large data sets and both continuous and categorical data (Landau and Ster 2010). A probability-based distance measure was used to develop the clusters, and the Schwarz-Bayesian information criterion (BIC) to determine the optimal number of clusters. A three-cluster solution was suggested, as this gave the best separation and cohesion. The goodness of fit in a two-step analysis is measured as a silhouette measure of cohesion and separation. The silhouette measure for the analysis is 0.2, indicating a relatively weak separation and cohesiveness of the clusters. However, given the complexity of the data this was to be expected.

Characteristics of the three clusters are presented in Table 6. The first and largest cluster, labeled *active green*, included over 40% of the sample. Almost everyone in this group preferred the Coop sharing type. The shared cars were used for various types of trips, but in particular holiday/weekend trips, leisure trips, and shopping for heavy goods. Households in this category used the shared cars several times a month (which is very frequent, in this context). Their most recent "sharing session" lasted for 1–2 days on average and covered a distance of 156 km. The use of (other) cars in this group was low, usually once or

twice a week; bikes were used approximately twice as often, and public transport on a daily basis. The environmental dimension of car sharing was salient for this groups of users, as were (to a lesser extent) economic and utilitarian aspects. The second group, labeled as *local flexible*, preferred the two stationary sharing schemes (B2C & Coop), and in contrast to the other groups, holiday and weekend trips were not the most important areas of use. Shared cars were mostly used for shopping for heavy goods as well as various other local purposes, including work-related trips. This group tended to make shorter and less frequent use of the cars, and none of the meaning dimensions were salient for this group. Economic benefit was the most salient aspect of meaning for this group of users.

[Table 6, Table 7]

The last group, labeled *long-distance holiday,* had a preference for the P2P type, though a few also used the two stationary types. The car was used relatively infrequently – usually on a monthly or bi-monthly basis – and mostly for holiday and weekend trips, as well as shopping for heavy goods. The cars were used for much longer trips, however, and the sharing events had longer duration. Users in this group tended to drive more private cars than in the other two groups.

Further analysis of the demographic variations across the clusters indicates that the *active green* users were more likely to have children (< 18) in the household than the other two clusters (Table 7). This group also had a significantly higher share of females. The *long-distance holiday* cluster consisted of younger informants and 22% had access to other owned or leased cars in the household. The *local flexible* users were holding the middle ground between these two clusters.

In sum, the analysis suggests that there are three different patterns of use of the shared cars, indicating different social practices. To move towards a richer description of the different social practices, in the next section we will describe cases within each of these clusters.

4.2 Case studies

4.2.1 Active green

"Household AG" are a married couple in their late thirties with two children, one and two years old, who live in the Tøyen area in central Oslo. They moved to their apartment about eight years prior to the interview, at which time they owned a small car. They bought a larger car when they had their first child, and used it very much at first. Since it was easy to find parking in their neighborhood, they drove to work every day, even if it was a short distance. However, after a while they chose to sell the car, because they realized they did not really need it. After 10 years of owning a car, the spouses made a joint decision to sell it. They further jointly decided to buy an electric bike and an electric cargo bike, and then to become members of Coop car-sharing community. Now the man bikes to the daycare center to drop off the children and then bikes on to work, while the woman walks to her office. Transport of groceries and

other goods is done by cargo bike. If they need to travel more than about 10 km, they use public transport, or pick up a car from the Coop. Disposing of their private car also meant that they drive less than when they had a car, as illustrated by this quote:

> *"I drove the car then, when we had a car, actually drove the car a lot. The car was mostly used for everyday life. So when the car was there, it was so easy to just get in it. At least to some extent, switching to car sharing has made us drive less. There has obviously been less driving in our everyday life now, and fewer longer trips as well."*

The family uses shared cars for holidays, scheduled weekend breaks, visits with friends and family, and occasionally for transporting large items or goods that the cargo bike cannot carry, as explained in these quotes:

> "*You often need a large car if you are traveling long distances with kids and strollers and everything. So then, borrowing my parents' car, that's too small. Now we have summer holiday, so we've been away for a week visiting my wife's parents in Stathelle [a small town about two hours' drive from Oslo]. And so we got a car from the Coop and drove there."*
>
> *"But when the stove induction top broke, I cycled to Ikea and bought a new induction top. So we use the bike for that too, because on such a transport bike you can bring along most things that you can bring in a car as well. You can even bring a washing machine and most other things if you need to. But obviously, if we had ordered a couch, it would be different; we'd have used a car."*

These quotes also illustrate a willingness to reflect on the household's transportation needs and the possibilities for switching between and combining different available modes. The household's earlier practice of using their car for "everything", including leisure, shopping and work travel, has changed. For this household, the cargo bike was just as important for their daily travels as access to shared cars.

According to Household AG, their mobility routines have changed, with less car driving in daily life and fewer long trips, because many former car trips have been replaced by (cargo) bike trips. This did, however, require making fewer spontaneous trips and planning ahead to coordinate the use of shared cars and/or public transport. Also, getting to and from daycare and work, and transporting children and bulky or heavy goods by cargo bike, demand much more planning than relying on a private car.

It took some effort for the couple to break away from their former habitual, car-dependent lifestyle. Their decision to dispose of the private car was partly driven by environmental concerns and motivations:

> *"As I remember it, it was the environmental aspect that made us choose Coop."*
>
> *"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."*

The last quote also illustrates that the environmental motivation had an affective dimension, driven by a desire to do something that "felt right". The environmental attitude also came across when they were asked about possible tax/fee incentives for shared cars:

> *"I think in a way that you should tax what is harmful to the environment. You might want to tax it harder, but you can't start subsidizing things [i.e. car use] that are harmful to the environment."*

The environmental aspects related to the car-sharing practice were salient, but the couple also endorsed the idea behind car sharing, and particularly the cooperative model. It was important to them that Coop is a member-owned organization, and that the money they pay in stays in the organization and goes to improving the service:

> *"We also chose Coop partly because it is a foundation. We felt we were paying back to ourselves somehow through the cooperative. We discussed that. So then we ended up with Coop rather than a commercial sharing service." […]*
>
> *"It's a question of values, not having a car. So it seems a bit like the wrong solution to still own a car."*

Although environmental and social concerns were highlighted, the practical and economic benefits were also significant. The couple emphasized the freedom of always having a car available nearby, which they also see as a form of security.

> *"It's convenient to know that you always have access to a car, rather than having to rent a car from a rental firm if you need one. Also, when you're a member of Coop, then the threshold for getting [access to] a car is lower than if you rent a car. We also talked about not making it so cumbersome to get a car that we never got around to it …. That we never would do anything or go anywhere anymore."*
>
> *"There's not much more to say about car sharing, other than that it is a little cheaper than having a car yourself. It's really expensive to have a car, so that's the main thing, I would say."*

Household AG have adopted a car-sharing practice that aligns well with what we described as *active green* in the quantitative analysis. By actively moving from ownership to sharing, the household has replaced private car trips with walking, biking and occasional car sharing. The decision to dispose of their car was apparently largely driven by environmental values, but also by their liking the idea of car sharing and the cooperative model. The "meaning of shared cars" also encompassed cost savings, although apparently not as a primary reason for adopting car sharing. The competence needed for this shift in mobility was not particularly related to the booking or driving of the shared cars, but rather to managing their everyday transportation without owning a private car. The shift in the practice required new skills in how to organize other routines in their everyday lives, such as dropping off children at daycare, doing household shopping and going on holidays.

4.2.2. Local flexible

"Household LF" are a cohabiting couple in their mid-thirties without children, who live in an apartment in the Ulven district of Oslo, about 15 minutes' drive from the city center. The man walks to work every day (about 10–20 minutes), while the woman drives to work. She has her own car and a reserved parking spot at work, and can also park right outside the apartment. According to her male partner, she is not fond of public transport, so she prefers to drive. The man also used to own a car, but after a change in work location to a place within walking distance, they decided to sell his car. He said that he had calculated that having a car was not worth the cost, since he did not use it nearly as much as when they

lived farther away from his workplace. When walking is not an option, he uses public transport – trips that usually were done by car earlier.

This couple are members of the B2C car-sharing scheme, and the shared cars are used as a supplement to the car in the household, in particular when he needs a car and cannot use hers. Below is a quote on how they began car sharing:

> *"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. And Hertz Carpool [B2C], I just really fell for it, because it was a safe, large and recognized company."*

The utilitarian aspects of sharing are predominant, such as easy access to a variety of relatively new cars, parking stations, and supporting services and infrastructure. The couple rely on car sharing as a practical and flexible solution when walking or public transport would be too time-consuming or cumbersome. With a carpool station just two minutes away across the street, they use shared cars mostly for short trips, such as work-related travel, shopping or errands.

> *"In Oslo, public transport coverage is good enough, so if you're going to do some errands in Oslo it's simplest to take the bus, unless you have to take a car because you need to bring something huge, or are going to shop at IKEA, for example. So it's convenient to have a car available anyway. Otherwise, I use public transport, if it's just me who needs to do some things. But if I need a car, or get a parcel, or go a bit out of town outside the municipality boundary, I take a carpool car."*
>
> *"If there's a lot of urban driving then I choose an electric car. But, it has happened that all the electric cars are rented out; then I have ended up with a small Auris. Those times when I was going to various stores, or fetching something big, I have taken a cargo van."*

The quotes illustrate how this way of using shared cars involves shorter trips in their local surroundings or on the outskirts of the town, where public transport is scarcer. Since they have another car in the household, shared cars were rarely used for longer holidays (as in the other practices).

The couple recognize that car sharing is a bit less straightforward than having a private car, but after a few trials, they easily learned the skills needed to plan and book in advance, use the mobile phone technology, and find and use the shared car, as expressed in these quotes:

> *"So, there is always a little more effort to book and so, if you have to do something and check something, as opposed to just getting the car keys and driving off with your own car. That's the easiest thing in the world. It's always a tiny bit more effort. So you have to plan a bit more in advance, you have to start walking 5 minutes earlier because it's in a different place, because it's not parked right at work. But even at the cost of not having a car, it's definitely worth it."*
>
> *"You can also unlock them with the phone by just replying OK to the message and just "click", and it opens. So it's very, very easy."*

When asked if car sharing has any meaning to him beyond cost savings and convenience, such as environmental or social benefits, he highlights economic and practical aspects:

> *"It's not anything I've thought about actively. It's not. But, socio-economically speaking, it is a very sensible service to have. There will only be fewer and fewer public parking spaces here."*

The way this couple is using shared cars is illustrative of the proto-practice that we have described as *local and flexible*. The shared cars are mostly used for short, local trips in connection with work tasks, shopping, errands or visits. It is used as flexible supplement to a private car in the household, not a replacement. The B2C station-based carpool is preferred because it offers practical booking and retrieval solutions from a pool of almost new cars. B2C is seen as a trustworthy professional/corporate provider, offering perceived transaction security and trustworthiness. Thus, the meaning of using shared cars is related to economic and utilitarian considerations, rather than environmental or social concerns. Acquiring the competence to handle the digital interface of the internet-based booking application is seen as a low threshold, as is learning to locate the cars and switch between different models. By choosing B2C they are guaranteed access to a vehicle that they know is clean, safe and reliable. Thus, many of the practicalities of possessing a (second) car such as maintenance, repairs, washing, etc. are eliminated.

4.2.3 Long-distance holiday

"Household LDH" are a couple in their early-thirties with two small children aged six months and two years, who live in a centrally located apartment in the St. Hanshaugen district, about 10 minutes' walk form the city center. They owned a car earlier, but sold it about six months prior to the interview, right before their second child was born. They had found that owning a car was too expensive in relation to how often they used it (only once every three weeks), and also inconvenient, primarily because of the lack of available on-street parking near their apartment. The man has bought an electric bike, which he often uses for going to work and performing daily errands, along with public transport. The woman uses public transport to get to work. The increased availability in recent years of internet shopping with home delivery options has also reduced their need to drive a car to do shopping. But a primary reason they mentioned for selling their private car was the availability of car-sharing options nearby. They started out using BTC, but changed to P2P as more and more peer cars became available, and now they use it frequently. The shared cars are used for various types of longer trips:

> *"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]."*
>
> *"I imagine that we've probably slowed down a bit, literally; I think we drive a little less. I think we take fewer trips to Halden [small town about one and a half hours' drive from Oslo] to visit family, but we stay for a longer time now. We go there on Thursday and then return home on Friday."*

This illustrates the types of long-distance trips that the shared cars are used for, but also that the use of shared cars is connected to other types of P2P sharing practices (Airbnb).

The interviewee has chosen P2P mainly for economic reasons; for instance he can negotiate with the owner and get the best price:

> *"What's good about Nabobil is that you can contact those who have a car and tell them "I'm going to such-and-such a place and the car will be standing idle for a week". I can then have a dialogue, which I think is very good. You don't have the same opportunity to haggle with a company that has a rigid way of doing business."*
>
> *"With Nabobil I've gotten interested in cars. Now I hire a lot of cars that I never could have afforded. For example Teslas. All week I'm looking forward to driving a Tesla on Friday. That's the car we've rented the most, actually. So in that way, Nabobil enriches my life."*

The first quote indicates that the interpersonal contact was attractive, as this allowed for the establishment of a (weak) bond between the renters and sharers. For these users the interpersonal type of trust was seen as attractive. The last quote above underlines that the man also had an interest in and affinity with sharing schemes and the personal encounter with peers, since he also reports using various online sharing platforms to rent equipment, buy left-over food from restaurants, and book accommodation (Airbnb) quite often.

As for the other cases, the man had taken care of the practicalities of registering and booking. For the man in this household, driving and handling different cars, as well as using the technology related to car sharing were an attractive aspect of the car sharing. He has developed skills in using different cars, and this acquisition of skills is something that he finds enjoyable in itself, as illustrated in the previous quotes and the following:

> "*I'm very fond of technology, so it's no sweat to learn how to use the online platforms. Always gotten by without a manual."*

Thus, skills and know-how, along with the perceived pleasure associated with using the material elements of car sharing (cars, technology) were important social practice elements for this user, similar to what was reported by several other respondents we interviewed in the P2P user group.

Getting the best price for a nice car was also seen as an important part of the sharing activity. The lower cost per km and no-middleman arrangement with P2P car-sharing schemes also allows users to hire cars for several days and to go longer distances for a more reasonable price than most other car sharing or rental options. Furthermore, when asked about alternative solutions, like more socially-oriented cooperative car-sharing scheme, it becomes apparent that this household is mostly concerned with the rational, economic meaning of car sharing:

> *"I think it's completely wrong [the cooperative model]. We're always a bit rational and just choose what's best. Because, in a way, once you start mixing in too many romantic ideas about this and that, the progress will stagnate."*

This couple illustrates many of the important characteristics of the proto-practice we described as *long-distance holiday* in the quantitative analysis. Car sharing through the P2P model is often preferred because it gives the user access to a range of nearby cars at a lower cost than most station-based schemes in Oslo. The pricing structure and possibility for negotiation of P2P allow users to travel longer distances and use more time when hiring cars, for instance hiring a car for several weeks or even the whole summer holiday. The sharing practice is rarely an environmental choice, but is instead understood as a type of economic

and practical "smartness". The skills connected to handling different cars, and finding and booking "the best car", and negotiating with strangers are seen as a central part of the sharing practice. Thus, the competence-dimension of the car-sharing practice becomes salient and also attractive for many of the more techno-savvy users. The fascination and enjoyment of testing different cars is apparent, indicating how the new practice involves another and more multifaceted type of materiality for many of its practitioners.

5. Discussion

In much of the literature, car sharing is promoted as a solution to environmental challenges related to intensive use of private cars that urban regions are facing. Its rapid uptake among urban dwellers over the last decade suggests that this can represent a viable alternative to private cars for a larger number of households in the future. It is well documented that car sharing, when it replaces an owned vehicle, has the potential to reduce car driving overall (Baptista, Melo and Rolim 2014; Chen and Kockelman 2016; Nijland and Meerkerk 2017). However, as a relatively new way of consuming car-based mobility, it is not yet a well-established social practice, and for many of the current sharers it involves considerable experimentation and testing. As we have found in this study, the use of car sharing is moving in three slightly different directions, which represent different routinized ways of using shared cars. Our efforts in this study have centered on locating and describing these dominant patterns of use, to contribute to a deeper understanding of these ongoing changes in the mobility practices of households. Given that these emerging patterns of use represent proto-practices that in the coming years may become more established, it is relevant to discuss the implications of the future constellation of these practices. Which of these will be more prominent, and what are the parameters that could lead to their becoming established social practices? On the other hand, it is of interest to raise the question of how policy measures can stimulate, transform or mitigate for these practices. While all the forms have some form of potential to reduce the volumes of car driving, the risk of rebound effects (in particular replacing walking, biking or public transport with driving) are more prevalent in some of these proto-practices.

5.1 From proto-practices to established practices?

In line with a social-practice-theory approach, we have focused on routinized ways of using shared cars, based on a combination of inductive statistical techniques and qualitative investigations of households. In so doing, we have responded to Nicolini's call for social practice theories that combine strategies "zooming in" on the detailed actions as well as "zooming out" to capture the general structures (Nicolini 2012). The multivariate statistical analysis helped us to locate overall patterned behaviors of using shared cars cutting across multiple business models. The benefit of using an inductive approach is that it explores structures based on the actual variations in the data, rather than using predefined categories, such

as demographics or business models. The findings presented here, outlining emerging proto-practices, may contribute to the more traditional analyses of car sharers' user-patterns (Becker, Ciari and Axhausen 2017; Prieto, Baltas and Stan 2017). At the same time, they give us an opportunity to "zoom in" on the emerging patterns of use, to better understand how these relate to households' everyday mobility behavior and emerging lifestyles. The study contributes to a growing interest in using a social practice approach to explore shared mobility (Dowling and Kent 2015; Kent, Dowling and Maalsen 2017; Kent and Dowling 2013)

As proto-practices, the three described structures should probably be seen as relatively fragile constructions, based on tentative linkings of new technologies, sharing of knowledge within networks and communities and active creation of meaning. Although the statistical analysis indicates that the practice-based groups are relatively robust and coherent, we can expect these structures to shift over time as new types of car sharing emerge and new ideas for use take hold. These user practices may continue as divergent and competing user patterns or merge into other types of sharing practices.

Proto-practices may over time crystalize into more recognizable routines when they take hold among a larger group of people and become stable, shared socially constructed configurations of elements. Analysis of changes in everyday life related to food, showering, laundry and other areas have documented how technology-related practices gradually find a place within a meshwork of other practices and sometimes also compete with them (Gram-Hanssen 2008; Greene 2018; Shove 2003). The role and meaning of a particular technology are under consideration and subject to "negotiation" by users before reaching a stage where they gradually freeze in a more or less stable position.

It is evident from our analysis, that car sharing can evolve into different routinized ways of traveling that do not necessarily compete with each other. These new practices may involve minor changes, where they figure as a mere appendix to the current car-based regime, and/or they can establish themselves as a radical alternative, where the understanding of "driving" and "cars" is seriously contested. In the latter case the new practice can be a disruptive force that helps bring about a transition to a new and radically different transport regime, where the wider system of practices is reconstructed (Spurling and McMeekin 2014; Watson 2012). According to what has been discussed earlier in this paper, a practice similar to what we call *active green* is most likely to be part of this type of change, since this involves a conscious rejection of ownership.

Regardless of which of these prospects are realized, however, changes in practices are happening in close connection to an array of technologies, including mobile applications, networks and sensors in the city, electrification, vehicle technologies, public transport services, allocation of urban space for cars, and more. Car sharing is obviously not relying on any *one* technology, but is a practice that springs out of combined technological opportunities, evolving around certain ideas and meanings. Given the rapid changes in these technological fields, it is unlikely that car sharing will find a stable form in the near future, although the emerging patterns have set a course for further development. It is obviously not

technologies alone that decide on the transformation in car-sharing practices. The qualitative studies gave indications of lifestyle-related issues involved in how car sharing was understood and used. The *active green* approach, for instance, was affiliated with an urban lifestyle, where the household aimed to live without cars, partly due to green attitudes; the *long-distance holiday* approach was connected to a "smart-living" type of lifestyle, where fascination with technologies was prominent. The *local flexible approach* seemed to connect to a traditional lifestyle, involving high-level mobility. Thus, lifestyle choices may be just as decisive for the transformation in car-sharing practices as technological and market-based novelties.

5.2 Policy implications

Following a social-practice approach, policies should seek to develop measures based on an understanding of existing and emerging practices (Shove and Walker 2010; Spurling and McMeekin 2014; Watson 2012). The social practice called *active green* is perhaps closest to the conception of car sharing that many think of when describing it as a sustainable way of using cars. As is evident from the qualitative results, this practice form is driven forward by the intention *not* to use cars, and to live a car-free life. However, this emerging practice relies on a well-functioning network of alternative transport facilities such as public transport and infrastructure for walking and biking. Living without privately owned cars is difficult to manage because of the need for households to organize transport to and from multiple workplaces, children's school, leisure activities, and more. Moreover, sustaining a car-free lifestyle based on sharing tends to be difficult, as people in this stage of life move out to the suburbs (Green 2010; Lanzendorf 2010; Rau and Manton 2016). Studies have found that reliance on shared cars is hard to maintain over time if the public transport services are perceived as insufficient (Julsrud and George 2019; Laakso 2017).

The second form of car-sharing practice, *local flexible*, represents a use of shared cars where shorter, local trips are dominant and where the cars also are used for work purposes. The elements of meaning that were linked to this practice were flexibility and convenience, and – as was evident in the case above – the shared cars can easily be used as a supplement to traditional car ownership. In so far as this way of using shared cars means that alternative modes of transport are used to meet most of the household's daily mobility needs, it should be welcomed in visions of sustainable cities. However is also has the potential to replace many local trips formerly done by bike or bus. Thus, to mitigate for this way of using shared cars, restrictions on the use of cars in the city center may be appropriate.

The proto-practice *long-distance holiday* seems to pose less of a threat of replacing local trips by bike, bus, train or tram with trips by car. It is mainly motivated by the convenience of getting easy access to cars through P2P providers, in particular for holiday use and on weekends. Similar to the other two practices, it gives urban dwellers the possibility to live without a car on a daily basis. On the other hand, those who used the shared car in this way often had access to other cars in the household, suggesting that this form may represent an add-on to the existing driving in the households. For some, this represented a possibility

to get access to specific cars, for instance bigger or faster cars, when going on holidays. Moreover, the qualitative interviews suggested that many saw this as an opportunity to try out various car models, with the intention of buying a car at a later stage. Thus, the longer-term effects of this car-sharing practice for reducing trips by car is uncertain, though it probably can make car-free urban living more attractive.

One striking feature of the proto-practices outlined above is that they are relatively strongly linked to the car-sharing business model. The P2P business model was in most cases related to a long-distance holiday form of car sharing. This may suggest that the new applications for sharing based on Web 2.0 functionality are changing car sharing into something different from what it has been until now, where access to cars (and other goods) is readily available through distributed digital networks. Our findings here are in accordance with other recent studies that find that different business models for car sharing initiate different ways of use and are related to different motives (Becker, Ciari and Axhausen 2017; Meelen, Frenken and Hobrink 2019; Wilhelms, Henkel and Falk 2017). Given the rapid uptake of P2P-based business models, it is critical that policy makers focus on these new forms, and their possible benefits and rebound effects. However, although some car-sharing forms seem to be more compatible with sustainable urban development, availability of various car-sharing types may in itself be positive for a rapid uptake of sharing, since a variety of car-sharing systems can meet the preferences of different user groups. A broad spectrum of car-sharing services can perhaps help to upscale car-sharing practices so that they get sufficient momentum to have an impact on the existing regime.

5.3 Concluding remarks

When highlighting a few dominant social practices, there is risk of elaborating a reductionist understanding of a complex social phenomenon. Although parsimonious explanations are often valuable, it is important to avoid over-simplification, and there is considerable variety in the performance of car sharing in households within and between these rough profiles. The descriptions of the proto-practices are typologies based on a relatively limited set of indicators, and are therefore necessarily superficial. Further research is needed to validate and/or explore them further.

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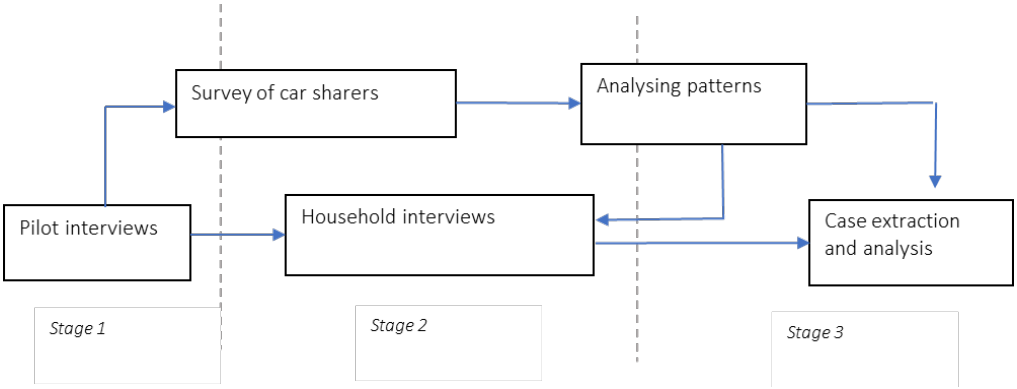

Figure 1. Analysis of data

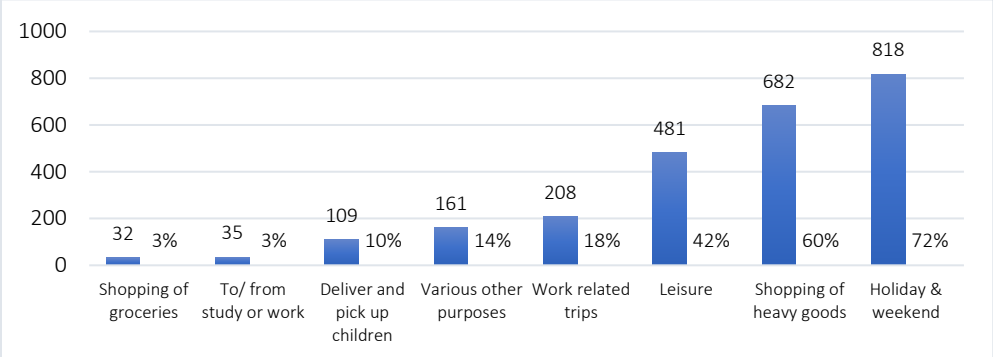

Figure 2. Most common types of trips using shared cars (1–3 types could be indicated), numbers and percent (of cases).

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

	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

** Have not used car sharing in last six months, or only rented out car (for P2P).*

Table 2. Qualitative data overview.

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

Table 3. Demographic characteristics for the car sharing types, percent.

	P2P	**Coop**	**B2C**	**Total**
*Gender****				
Female	32,2%	41.4%	23.5%	37.4%
Male	67.8%	58.6%	76.5%	62.6%
Age***				
< 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%
*Children in household (< 18 years)****				
Yes	30.7%	48.8%	40.9%	44.5%
No	69.3%	51.2%	59.1%	55.5%
*Distance to closest PT-stop**				
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%
*Frequency of use****				
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%
*Position****				
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.*

Table 4. Indicators of meaning.

	Mean	**St.d**	**Min/max**
Car sharing fits my identity	4.7	2.1	1->7
I want more environmentally friendly travel	4.9	1.9	1->7
Car sharing is social	2.5	1.8	1->7
I like the idea of car sharing	6.0	1.2	1->7
Car sharing gives me more freedom of choice	5.2	1.5	1->7
Car sharing is more practical than owning a car	5.6	1.6	1->7
Car sharing reduces my transport costs	5.8	1.4	1->7

*Table 5. Factor loadings, rotated and sorted component matrix.**

	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

** Factor scores below 0.4 are not included*

*Table 6. Cluster characteristics.**

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

*Table indicators: * Low; ** Medium; *** High*

Table 7. Cluster membership and demographic characteristics, percent.

	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

*** Sig. < 0.001*

Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: