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Giving up cars – The impact of a mobility experiment on carbon emissions and everyday routines

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ABSTRACT

Despite recent political and scientific interest in experiments, there is little research on participants' experiences of experimentation. This article focuses on an experiment during which eleven participants gave up ownership of their cars, and in return, received free travel cards to local buses for six months. The experiment is analysed from two perspectives. Firstly, the impact of the experiment on carbon emissions of the participants' everyday mobility is estimated based on weekly mobility surveillances and travel card data. Secondly, the practice theoretical approach is used to study the change in participants' mobility routines. The results indicate that the processes of de- and re-routinisation depend on multiple structural and individual factors reinforcing each other. Although carbon emissions of everyday mobility were reduced because of the experiment, there was variation in how the new routines were (or were not) acquired among the participants. The article suggests that, when analysed from the practice perspective, experiments might work as tools for mutual learning on how to make local public transportation more attractive among residents. Attention should also be paid to reducing the need for driving in the first place, as well as to providing more support and services for car-free living.

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1. Introduction

Mobility¹ plays an important role in the transition towards sustainability: not only does it account for 20% of carbon emissions in Europe, other negative consequences include local air pollution, noise, accidents, increasing congestion and land use, and social exclusion (e.g., Banister, 2008; Brög et al., 2004). Despite these widely recognised detrimental impacts on sustainability, the dominance of cars has not diminished; on the contrary, transport is the only major sector in the EU where greenhouse gas (GHG) emissions are still rising (Thomas, 2015).

Countries and cities globally have pursued strategies for sustainable transport.² However, the discussion on sustainability transition in mobility has focused predominantly on technological developments and encouraging changes in behaviours and choices of individuals, while overlooking the embeddedness of mobility in our daily, and social, life (Schwanen et al., 2011; Sheller and Urry,

2000; Watson, 2012). However, as Nijhuis (2013: 219) describes, “mobility forms the cement without which other social practices would only be loose bricks.” Consequently, research has recently shifted to emphasise the importance of understanding the broader contexts in which travel choices are made and mobility practices performed (Cairns et al., 2014; Shove et al., 2015).

Experiments are considered an innovative way and ‘safe spaces’ for people to ‘trial behaviour’ and for local policy to gain new knowledge and find alternatives to status quo (Heiskanen et al., 2015; Laakso and Lettenmeier, 2016; Sengers et al., 2016; Strömberg et al., 2016). The appeal of experimentation is that new ways of doing could eventually diffuse into the mainstream. Reviews of interventions promoting public transport (PT), for instance, have nevertheless showed that the effects of experimentation often remain temporary, and people involved in interventions tend to return to their old habits (e.g., Redman et al., 2013).

For experiments to promote local sustainability and to gain understanding of the adoption of new practices (and discarding of old ones) due to experimentation, the experiences of participants are important. Relevant questions include: how participating in an experiment affects participants' routines and everyday living, what effect these experiences have on the success (or failure) of

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¹ Mobility is understood here as more or less regular and frequent physical moving, such as daily routine travel to and from work (c.f., Banister, 2008).

² Sustainable transport is defined here as transport not endangering public health or ecosystem services (c.f., Nygrén et al., 2012).

experiments, and how could future experiments – and local policy in general – take these experiences into account?

In answer to these questions, this article presents the results of a study of an experiment called ‘Give up your car’. In this experiment, eleven participants gave up ownership of (one of) their cars and, in return, received free travel cards for local buses valid for six months. This article approaches this experiment from two perspectives. Firstly, from the perspective of environmental sustainability, by analysing the reduction in GHG emissions of participants’ everyday mobility. Secondly, from the perspective of de- and re-routinisation of mobility practices due to the experiment, based on extensive reporting of the participants on their everyday mobility.

The article proceeds as follows: Section 2 introduces the theoretical background, and Section 3 discusses the context, materials, and methods of the study. The results in Section 4 are divided to environmental impacts and everyday practices. The results are discussed in Section 5, and Section 6 is the concluding section of the article.

2. Framework of the study: practice theoretical approach to studying experiments

2.1. Mobility as a practice

A variety of studies analyse driving as a behaviour, driven by attitudes, personal norms, and lifestyles (c.f., Abrahamse et al., 2009; Cairns et al., 2014). Traditional travel behaviour theories (reviewed by e.g., Gärling and Fujii, 2009) have attracted criticism because they assume behaviour to be deliberate and largely detached from social and structural contexts (Barr and Prillwitz, 2014; Heisserer, 2014). In the practice theory, practices are seen as the central social phenomena, by which other social entities, such as actions, institutions and structures, are understood (Reckwitz, 2002; Schatzki, 2002; Shove et al., 2012; Warde, 2005). Practice theory is widely used to understand the dynamics of everyday mobility and to explore ways of moving beyond automobility (Birtchnell, 2012; Watson, 2012), covering areas such as commuting (Heisserer, 2014), leisure travelling (Hui, 2013), food shopping (Mattioli and Anable, 2017), car sharing (Kent and Dowling, 2013), electric car driving (Ryghaug and Toftaker, 2014), and passengering (Laurier et al., 2008).

Mobility can be understood as a complex of interconnected practices (like driving and commuting) that intersect with other daily practices (such as housing and shopping), in the context of socio-technical systems, institutions, and modes of spatial and temporal organisation (Aro, 2016; Shove et al., 2015, 2012; Warde, 2005). Practices are connected to each other by shared, recognisable and describable elements: material objects, understandings and competences, and objectives and meanings (c.f., Gram-Hanssen, 2010). Practice theory avoids methodological individualism, and thus enables empirical analysis of the complexities of a phenomenon such as mobility. This is possible by turning attention to technologies and infrastructures, shared rules and understandings of normality, as well as social and personal norms that constitute practices (Halkier and Jensen, 2011; Higham et al., 2013).

Practices are reproduced through recurrent, non-reflexive and shared actions and conventions: in other words, routines. Routines are “observable performances of stable practices” (Southerton, 2013: 337) that make people meet the standards they think of as normal and common (Aro, 2016; Shove, 2003). These so-called faithful performances need to change for patterns of everyday living to shift in more sustainable directions (Evans et al., 2012; Southerton, 2013). An interesting issue lies in the dynamics between the stability and elasticity of practices (Hargreaves, 2011;

Southerton, 2013). On the one hand, practices can become entrenched (Røpke, 2009). On the other hand, people continuously change their routines throughout their lives, and there are individual differences in performances of practices (Gram-Hanssen, 2008; Nijhuis, 2013).

2.2. Experimenting sustainable mobility

In recent years, a lot of political and scientific attention has been paid to experiments (Berg, 2013; Evans, 2011). Testing out technologies and policies under real world conditions can prompt new ways of learning, and eventually complement or change local (and national) policy (Castán Broto and Bulkeley, 2013; de Bruijne et al., 2010). According to Berg (2013), conducting an experiment means making something new and concrete that is restricted in terms of time, space, scope or actors, and has the potential to have a wider societal relevance. Another important characteristic of experiments is that there must be a possibility of failure (Karvonen and van Heur, 2014).

Although many dimensions of mobility regimes, like traffic regulations and mobility culture, are national or wider, some, such as urban planning, are local (Geels, 2012; Urry, 2004). Mobility experimentation has included introducing new technologies, such as electric vehicles and car-pooling platforms (Brown et al., 2003; Sengers, 2016). Even if these are relevant alternatives to gasoline-fuelled cars, PT still plays a key role especially in urban mobility, with competitive uses for space dominated by cars. Breaking the habit of car use requires a ‘trigger moment’ (Nijhuis, 2013) or a ‘discontinuity’ (Verplanken et al., 2008), such as an opportunity for a free trial. These kinds of interventions have indeed succeeded in attracting car users to test PT (Redman et al., 2013). Spaargaren (1997) calls this moment *de-routinisation*, a point where an individual is able to examine the routine nature of one’s behaviour from a specific perspective. This may lead to a trial period, during which new ways of conducting the practices of everyday life are tested.

The challenge is to obtain *re-routinisation*. This involves the restructuring of new, more or less stable routines, as actors are drawn into, and defined by, the practice in which they engage. Over time, they become committed to this practice, such as a new means of mobility (Ryghaug and Toftaker, 2014; Shove et al., 2012). Experiments can provide a ‘window of opportunity’ for this process to materialise (Nijhuis, 2013: 154–155). However, a thorough review of Arnott et al. (2014) on 27 behavioural interventions, suggests that there is no evidence on the efficacy of interventions in decreasing the frequency of car use. The finding is supported by a review of 77 behavioural interventions by Graham-Rowe et al. (2011), as well as Redman’s et al. (2013) review on 74 studies of PT improvements. Results indicate that interventions, such as free travel cards, encourage bus use in the short term, but the effects are not maintained when the incentives are removed. For example Fujii and Kitamura (2003) and Thøgersen (2009; Thøgersen and Møller, 2008) conducted studies on the impact of free travel card on altogether 396 car users in Kyoto and Copenhagen. In both cases, the intervention succeeded in attracting car users to use PT, but post-intervention, the participants did not use PT more than control subjects (Thøgersen, 2009). Hindrances to using PT are related to, for instance, an access to a car as well as the underlying motivations for using private vehicles (Redman et al., 2013).

As routines are not solely individual features, but performances of social practices, it is important to understand how different inter- and path dependencies affect these performances, and to reconfigure these connections to reduce the environmental impacts of everyday life. Practices may transform due to changes in the elements constituting them, changes in the configurations or connections of practices, or due to patterns of recruitment and

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