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Exploring characteristics and motives of long distance commuter cyclists

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ABSTRACT

Longer distance cycling is a commuting mode that contributes to sustainability and public health objectives, but little is known about current long distance cyclist's motives. The paper explores longer distance commuter cyclists, their characteristics, practice and motives. Longer distance, commuter cyclists (> 5 km from home to work) have more mobility options, higher incomes, and a longer education than other commuter cyclists. The main motive for longer distance cycling is physical exercise, followed by reduced costs and time used for traveling. The long distance commuter cyclists surveyed are very positive about their commute - pointing to positive experiences, better mood, and stress relief as experiences related to their cycle trip to work. Policy support should devote attention to unlocking the potential that may be embedded in individuals combining their exercise and travel time, budgets to promote active travel to work as well as the role of psychological benefits as a factor in promoting and sustaining cycling practices.

1. Introduction

Cycling is generally distance dependent as the car and other motorized travel modes become dominant at longer travel distances. There is a wide interest in the promotion of cycling for sustainability and public health reasons, but the increasing commuting distances and the corresponding labor markets are likely to be a key challenge. By 2011 the average commuting distance in Denmark was 19.7 km, and the growth patterns of recent decades have increasingly favored cross-, reverse- and intercity commuting. Consequently commuting by car is widespread–giving rise to congestion challenges especially around large and mid-sized cities. Plans are being made nationally and at the city level (e.g. cities of Odense, Aarhus, Aalborg and Copenhagen) for more and better cycling facilities, but there is still limited knowledge on the context and motives for longer distance commuter cyclists.

In the city of Copenhagen, some 35% of all commuter destinations are reached by bicycle. The city of Copenhagen is the center of a metropolitan region which provides good conditions for cycling in terms of accessibility and level of service including cycle lanes, signaling at intersections and so forth. Copenhagen has declared an ambition to be the best city for cycling in the world, and includes in this an ambition to increase the cycling share of access modes to places of work or education located in the City to 50% by 2015 (City of Copenhagen, 2011). This is likely to require significant efforts and more people must receive the right offers and incentives to switch to cycling or combinations of public transport and cycling. Importantly, it is likely to require increased cycling range by encouraging commuters from the suburbs to switch to bicycles and cycle longer distances than average.

Thus, longer distance bicycle commuters become an important target group. Currently a “Cycle Super Paths” project aims to provide 26 routes or 300 km Cycle Super Highway connecting Copenhagen with the suburbs in a mainly radial network following the historical “Finger plan” which also reflects the main movements of commuters in- and out of the regional center. The new and upgraded network aims to provide: “fast, comfortable and safe service” for cyclists who commute longer distances to work (City of Copenhagen, 2012). Twentyone municipalities and the Capital Region take part in the project which has a budget target of 117 Mill Euro. However, in addition to an effort to brand the new Cycle Super Highways, emphasis remains on physical or technically oriented solutions and optimization, especially the provision of cycling paths and related infrastructure. An understanding of the practices and motives of longer distance cyclists seems to be an overlooked aspect in many Danish cycling projects, but is very likely essential to provide the right infrastructures in the right locations, and to engage in efficient cycling promotion in a broader sense.

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According to the "Handbook for Physical Activity" (Danish Health and Medicines Authority, 2011), epidemiological studies among adults consistently show that physically active people have lower morbidity and mortality. The risk is nearly halved among the most physically active people. Following Mokdad et al. (2004) 18% of the mortality rate among adults is related to physical inactivity, while other evidence points to muscle activity as an activator and de-activator of genes and proteins that counteract or increase the risk of serious illnesses (Pilegaard et al., 2000). Other theories indicate that hormone changes during physical activity, presumably levels of beta endorphin and concentrations of monoamine (Mynors-Wallis et al., 2000), may have a positive influence on mood. Evidence supports that cycling everyday can make a substantial contribution to physical health (Andersen et al., 2000; Cooper et al., 2008) including less sickness absence from the workplace (Hendriksen et al., 2010). In addition to the physical benefits, the semi-structured survey presented in this paper indicates that the psychological benefits should be devoted more attention and that they may provide important explanations and motives of long distance commuter cycling.

Previous research has generally treated distance as an important aspect which influences cycling, or as a criterion for including bicycles in the choice-set of transportation modes to be considered in modeling and analysis (de Geus et al., 2008; Christensen and Jensen, 2008). Despite an increasing awareness of heterogeneous preference structures among travelers (see Ryley, 2006; Carrel et al., 2011; Halldórsdottir et al., 2010), profiles and comparisons of cyclists according to the distance traveled are rare. Heinen et al. (2011) who compared the role of trip-based benefits, safety, attitudes, and other psychological factors for cycling on shorter and longer commutes is a rare exception. Findings indicated that cycling on longer commutes is more related to attitudes and psychological factors than on shorter commutes. The wider literature has focused more on the general effect of distance or time, or preference or risk aspects (Dill, 2009). Commuter cyclists generally favor shorter routes and often use the road network (Aultman-Hall et al., 1997) or prefer routes with cycling infrastructure and facilities (Heinen et al., 2010).

When it comes to the motives and characteristics of individuals, authors indicate that these are more significant in determining cycling than urban form. Cycling is significantly associated with the urban environment and infrastructure provisions (see e.g. Nielsen et al., 2013) but is also to a large degree an individual choice which is relatively independent from the physical environment (Moudon et al., 2005). The specific balance between individual choice and urban environment and infrastructures may also depend on the provision of cycling infrastructure and whether it is below or above a minimum provision for cycling (de Geus et al., 2008). Studies quote reasons for not cycling such as the weather, the risk of injury, illness, safety concerns (daylight) and the need to conduct errands with a car during the day (Stinson and Bhat, 2004). Reasons for cycling include: fitness/health concerns; pleasure/enjoyment, including enjoying scenery, being outside, mental well being, environmental concerns, convenience/speed/flexibility and the avoidance of driving in congested areas (Stinson and Bhat, 2004; Heinen et al., 2010; McKenna and Whatling, 2007). Commuting relates to symbolic and affective motives (Steg, 2005) and Heinen et al. (2010) point out that there are numerous determinants of cycling including motivational and emotional aspects, and there is a general need to expand methodologies and theoretical grounding based on new kinds of knowledge. Gatersleben and Uzzell (2007) looked specifically into the affective aspects of cycling, finding that cycling is more relaxing and exciting, compared to commuting by car which is considered more stressful.

This paper aims to improve our knowledge on the use of the bicycle for commuting and especially the practice and motives of longer distance cyclists. The cycling distance issue is the main focus of the paper which investigates the differences between long distance cycle commuters and other cycle commuters, the practices of long distance commuter cyclists as well as the personal motives for commuting longer distances by bicycle.

The paper is descriptive and explorative in that it compares the characteristics of shorter and longer distance commuter cyclists, and elaborates practices and motives among longer distance commuter cyclists as a phenomenon of interest. The topic is framed by policy interests but strict conclusions about cause and effects are beyond the scope of the paper.

2. Methodology

The paper relies on the application of the Danish National Travel Survey for descriptive analysis of cycle commuting and long distance cycling to work, as well as a small semi-structured survey ($N=108$) which targets long distance commuter cyclists in the greater Copenhagen area. While the Danish National Travel Survey provides an overview of all travelers and travel activities based on a large representative sample, the additional survey ($N=108$) provides a basis for elaboration of variations in long distance cycling practices, as well as the experiences and motives for cycling. Given the sample size and methodology the results are to a certain extend qualitative or ideographic case stories, but serving to identify practices, rationales, and motivational structures which will be important in future research focusing on longer distance commuter cycling.

In the Danish National Travel Survey, some 10,000 inhabitants aged 10–85 are questioned every year about their travel activities of the previous day (Christiansen, 2009; Jensen, 2009). The survey provides a detailed account of one day's travel activities including trip stages, trips, journeys, and the travel purposes that they link. A number of attributes at the level of the household or the individual are also part of the survey. These include details on household cars, household composition, age, gender, education, occupation, driver's license, as well as a few details about work/workplace such as working hours and the provision of parking at the place of work (Christiansen and Haunstrup, 2011). City size, city, region, and distance to employment concentrations are added to the survey data based on the home locations of the respondents.

This paper relies on data from 2006–2011. The pooling of several years of survey results is necessary to facilitate the analysis and allow conclusions to be made on the sub-population of long distance commuter cyclists. Cycle commuters are identified in the national travel survey data as commuters who have used a bicycle as a main mode on at least one journey leg to or from work on the day of survey. Long distance commuter cyclists are identified as commuters bicycling at least 5 km to or from work. The choice of 5 km is partly pragmatic as very few commuter cyclists are observed cycling more than 5 km, thus technically limiting the application of the data. In the Danish case 5 km corresponds to the 75% percentile of bicycle-commuters home–work distance (see Fig. 1). Five kilometers is a relatively long cycling distance, which still allows the longest distance cyclists to be identified and compared to others in analysis. Acknowledging that the definition or perception of long-distance cycling may vary, a test of the sensitivity of results was done based on 8 km as the definition of long distance cycling (90% percentile).

Descriptive analysis of the correlates of commuter cycling when cyclists are compared with other commuters, as well as correlates of longer distance commuter cyclist compared with other cyclists are presented in the form of bivariate logistic