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The dynamics of commuting over the life course: Swiss experiences

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ABSTRACT

Daily travel behavior, and especially commuting behavior, is strongly determined by the location of the places of residence, education and employment. After changes in these spatial choices, people inevitably show a travel behavior that is different from the travel behavior before these relocations occurred. Therefore, spatial alterations provide interesting starting points for policies and other interventions aiming at travel behavior change, as habits and routines are broken or at least weakened, and individuals reconsider their behavior and consciously reflect their decisions.

The life-oriented approach is utilized in order to examine the interrelationships of various life choices with respect to the development of the commuting behavior over time and over people's life courses. These analyses require corresponding longitudinal data, which was collected in the Zurich region, Switzerland, in a retrospective survey covering the 20 year period from 1985 to 2004.

The results show that the different dimensions of the life course are highly interdependent. The changes in residence, education and employment are to a great extent related to one another, occurring simultaneously rather than successively. A strong connection is also observed between the ownership of mobility tools and their usage for commuting. This applies likewise to changes in occupation (encompassing both education and employment) and the most frequently used mode of transport for the commuting trips. Following a residential relocation, the mean distances to the places of occupation decline, indicating that moving is used as a mean to reduce commuting. In contrast, changes in education and employment lead to considerably longer commuting distances. Interestingly, persons altering their places of residence and occupation simultaneously have even lengthier commutes. The ownership of both cars and public transport tickets rises after all changes. Concurrent with this increase in mobility tool availability, the corresponding usage for commuting also expands overall. Private and public transport are in general more frequently used, while cycling and walking decline.

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1. Introduction

Daily travel behavior, and especially commuting behavior, is strongly determined by the location of the places of residence, education and employment. After changes in these spatial choices, e.g., due to moves or changes in occupation

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(encompassing both education and employment), people inevitably show a travel behavior that is different from the travel behavior before these relocations occurred, as usually trip distances, routing, timing and frequency are altered (Chapin, 1965, 1974; Hägerstrand, 1970; Scheiner, 2006). At the same time, the availability as well as the quality and quantity of the available transport systems change. In turn, the decisions about the ownership and usage of the various mobility tools, such as cars and different public transport tickets, are influenced, as they provide access to the different transport systems and determine the marginal costs of use. In this context, the relationship between migration and mobility becomes much closer, as the ability to commute over longer distances, without significantly increasing travel times, gives people the opportunity to substitute residential relocation by commuting. This leads to a reduction in residential mobility due to changes in occupation (Kalter, 1994; Pooley et al., 2005).

Residential and occupational decisions have long-lasting effects, since corresponding changes involve substantial amounts of resources (costs, time, etc.). Therefore, it is necessary to analyze their dynamics over longer periods of time. A longitudinal perspective is available from people's life courses, which link different dimensions of life together. Besides personal and familial history, locations of residence, education and employment as well as the ownership of various mobility tools and their usage can be taken into account. These life course dimensions are usually not independent from one another. Events in one area are frequently connected to changes in other areas. Decisions are rarely made in isolation and choice behavior is often context dependent (for example, Beige and Axhausen, 2012; Verhoeven et al., 2005; Zhang et al., 2014).

This interdependence of people's choices in various life domains is likewise explicitly assumed in the life-oriented approach, which emphasizes a two-way relationship between these decisions and travel behavior (Zhang, 2015, 2016). By incorporating various life choices, the life-oriented approach aims to improve the estimation of travel behavior models and to avoid biased forecasts. This is especially important in the context of policy decision-making, since behavioral responses of people towards different policy measures are thus better predicted (Zhang, 2015, 2016). The life-oriented approach, as already put forward in life course and biographical approaches, also has the advantage of adopting a longitudinal perspective instead of studying life decisions only at a single point in time, as the relationship between life choices and travel behavior is not necessarily invariant over time, and especially over the life course (Zhang, 2014).

In this paper, the following research questions are addressed:

1. How does the residential, occupational and commuting behavior develop as a whole over time and over people's life courses?
2. To what extent are changes in residence, occupation and the corresponding commuting behavior connected to one another as well as to other life choices? And what happens when these changes occur?
3. Which socio-demographic and socio-economic characteristics are associated with changes in residence, occupation and commuting as well as with the durations between these changes?

In the next section, the concept of the life course approach is illustrated, followed by a review on the dynamics of commuting. The main part of the paper then concentrates on empirical analyses of the observable dynamics in residence, education and employment and the related commuting over time and over the life course. Section 4 describes the data used, while Section 5 presents various results with respect to the development of the residential, occupational and commuting behavior. The commuting behavior, encompassing both the travel to the places of education and employment, is investigated in detail with respect to the corresponding distances and the most frequently used mode of transport. Furthermore, the changes in residence, occupation and commuting are analyzed in relation to other life choices. Finally, the results are summarized and conclusions with respect to transport policy making are drawn.

2. Life course

The life course itself can be regarded as a contextual system (Mayer, 1990). A person's past affects his or her present, and his or her present affects his or her future, as individuals seek coherence and continuity (Ryder, 1965). Blossfeld and Huinink (2001) also describe the life course as a self-referential process. Each domain of life forms a part of this process. They are linked together by time and age. During the life course, the various dimensions have different priorities (Blossfeld and Huinink, 2001). Furthermore, the life course is embedded in the external conditions, i.e., the structuring influence of other people's life courses and society.

The structure of the life course is captured with its trajectories and transitions (Elder, 2000). The trajectories describe different domains of life, such as the social background, family life, education and employment, spatial mobility as well as health issues, etc. The transitions represent changes in a state that are more or less abrupt, for example, marrying, divorcing, the birth of children, entering and leaving school, acquiring and changing a job, retiring. Each transition is embedded in a trajectory that gives it specific form and meaning (Elder, 2000). Alternatively, the life course is seen as a sequence of events (Sackmann and Wingens, 2001). In this context, it is worthwhile to understand an event as well as the history leading up to its occurrence, since past behavior is strongly correlated to present behavior (Box-Steffensmeier and Jones, 2004). At the same time, expectations about the future play an important role (Oakil, 2013; Tran, 2015; Zhang et al., 2014).

Based on the life course approach, Lanzendorf (2003) develops the framework of mobility biographies for the analyses of travel behavior. It distinguishes between three life domains covering the relevant trajectories for travel behavior: first, the

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