



Mobility Styles in Leisure Time — Target Groups for Measures Towards Sustainable Leisure Travel in Swiss Agglomerations

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Abstract

The primary objective of this contribution is to present an approach for researching mobility styles in leisure time. A representative survey for the urban population living in the French and German-speaking parts of Switzerland has been carried out. By applying cluster and factor analysis to this data, four leisure mobility styles were identified: 'The Sporty Types' (SPO) (pro bicycle), 'The Fun and Distraction Seekers' (FUN) (pro car), 'The Culture Oriented' (CUL) (critical of car and multimodal), and 'The Neighbourly Home-Lovers' (HOME) (pro car and public transport).

The second aim is to test the assumption that transport behaviour can be better explained through analysis of these four mobility styles. Multivariate analysis has indicated that the mobility style dimension can indeed make an additional contribution towards clarifying variance in travel behaviour. Mobility styles in leisure turned out to have a significant influence on the following travel figures when controlling for other variables: undertaking trips in general and for the purpose of 'visiting friends and relatives' in particular, share of bicycle and car used on trips, share of car use against distance travelled, and distance travelled for leisure.

Keywords

Mobility orientations, lifestyles, mobility styles in leisure time, urban mobility, travel behaviour, leisure travel

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1 Introduction

Over the last few decades, the motives and determinants of individual travel behaviour have been analysed from different perspectives. While the main approach explains personal mobility due to objective constraints (e.g. the built environment, space, travellers' socio-demographic characteristics, and general costs of travel), travel behaviour research has added several sociologically driven perspectives for analysis, such as role patterns, household interactions, time budgets, activity planning, and mobility biographies. Another possible angle from which to understand travel behaviour is the lifestyle approach. Lifestyles can be understood as a latent construct compromising individuals' attitudes, values, and orientations; the latter are expressed, for instance, in different tastes (Bourdieu, 1984), but also influence everyday life behaviour and expressions of taste which may be related to daily practices.

Transportation researchers aim to understand, describe and model the travel distances, mode of transport and destination choices that people make during their everyday lives. It is often assumed that travel is a pre-determined demand derived from various factors. But leisure travel is not affected as strongly by necessities as for instance labour-related transport. However, the dimension of attitudinal issues and lifestyle, and its effect on travel behaviour, especially in the leisure context, has not been taken adequately into account – be it the perceived value of a particular means of transport in terms of symbolising a socio-cultural position, or its commodiousness (e.g. reading a book on a train). Hence, this contribution pursues two main objectives in attempting to shed some light on the interrelations between lifestyles and travel behaviour for Switzerland:

Firstly, we argue that differing orientations with regard to people's preferred leisure activities and their attitude to different modes of transport are reflected in their 'mobility styles in leisure time'. This paper views the concept of mobility styles during leisure time in terms of attitudes, values, and orientations pertaining to the domain of mobility and leisure pastimes, in other words a specified area of lifestyle. The main remit of the mobility style approach as applied to leisure time is to group individuals in a meaningful way that embraces lifestyle attributes related to mobility and leisure activities. Methodologically speaking, meaningful groups based on leisure and mobility orientations are formed by applying factor and cluster analysis. Hence, the first objective of this contribution is to demonstrate how to construct mobility style groups in leisure time for citizens living in Swiss metropolitan areas.

Secondly, our hypotheses is that there is a correlation between the mobility style-groups and various parameters of travel, such as trip rate, mode split, trip purposes and travel distances for leisure and in general. We hypothesise that mobility styles are significantly related to habitual practices and are thus part of expressing lifestyles which may also be manifest in travel behaviour. A vivid example of lifestyle-oriented travel was, for instance, the trendy 'Dorian

Gray' disco at Frankfurt airport, frequented on an international scale in the 70s, even by plane. The other extreme is the local pub around the corner, from which one can stagger home on foot. This local pub does not become one's 'local' just because it is so conveniently located, but because the right people go there. Hence, we test the assumption that transport behaviour in leisure time and in general can be better explained by analysing lifestyle-specific orientations, background attitudes, and motivations. This is undertaken for the Swiss population living in urban agglomerations.

The remainder of this contribution is organised in five sections: In Section 2, we present relevant strands of discussion in transportation research concerning the approach of mobility styles in leisure time. This is followed by a brief discussion on data collection in Section 3. In Section 4 we then present the methods applied and how to construct and interpret mobility style in leisure time for those living in Swiss agglomeration areas. Section 5 goes on to consider how to model the relation between leisure mobility styles and indicators of travel behaviour using multivariate methods. Finally, a summary and a conclusion of the main empirical findings will be provided (Section 6).

2 Theoretical backgrounds and previous research

2.1 Social stratification and lifestyles

The theoretical background of mobility styles rests on a three-dimensional definition of the term. Firstly, spatial mobility is considered as the manoeuvrability of individuals and objects within a physical geographical space. Secondly, socio-spatial mobility is conceived as the availability within social space of opportunities to fulfil needs such as places to eat, sleep, work, undergo training, enjoy life, and so forth. Thirdly, socio-cultural mobility represents social positioning (Jahn and Wehling, 1998). Hence, we argue that mobility is connected with attitudes, values, and orientations. In the latter case, the underlying assumption is that there is always a symbolic dimension to where and how one moves, which in turn demonstrates one's affinity to a particular social milieu. As a result, consideration of all three mobility dimensions when researching travel behaviour implies a need to operationalise travel behaviour as a derived demand, on the one hand in order to satisfy personal needs, and on the other as a dimension of social positioning in the form of lifestyle orientations.

Over the past few years, lifestyle and attitudinal research have been identified as important additional approaches of explaining travel behaviour, particularly with regard to leisure mobility (Lanzendorf, 2002; Götz *et al.*, 1997; Götz, 2007; Scheiner and Holz-Rau, 2007; Anable, 2005).

The debate is rooted in sociologically driven theories of increasingly differentiated and individualised ways of life, which lead to augmented forms of social stratification and differentiation in modern societies (Giddens, 2001). In opposition to the early lifestyle-discussion we do not assume an antagonism between approaches of social inequality (vertical differentiation) and pluralisation (horizontal differentiation). We assume the resulting variability of inequality patterns to be closely related to forms of mobility and travel (see Ohnmacht *et al.*, forthcoming, for a discussion on mobility and inequality structure). In general, social stratification and pluralisation refers on the one hand to unequally distributed resources, e.g. wealth, status, prestige, or power, within a social system (Erikson and Goldthorpe, 1992), and on the other hand to different social positions or styles of everyday life. Our understanding of social stratification is thus based on the placement of individuals within 'social space'. To put it simply, 'social space' implies two dimensions:

Firstly, it contains a vertical dimension, by which we mean differences in socio-demographic and socioeconomic characteristics, such as gender, age, income, educational attainment, and so forth. Secondly, social stratification is distinguished by horizontal dimensions, by which we mean differing attitudes, opinions, tastes, and values (Bourdieu, 1984; Bergman, 1998). In this ideal-typical understanding the two axes are considered orthogonal. But it should be stressed that these two axes are often considered interdependent (cf. Konietzka, 1995).

These theories ascertain that one's position within social space is closely related to the dimension of lifestyle (for Switzerland see Lamprecht and Stamm, 1998). Given such a background, the lifestyle concept with regard to mobility and leisure activities – namely mobility styles in leisure time – assumes that besides the classical factors explaining a person's travel behaviour – e.g. income, age, gender, and so forth – various other personal characteristics – e.g. attitudes, opinions, and values – determine travel behaviour. In practical research terms, this means that methods used in attitudinal and lifestyle research are coupled with methods of researching travel behaviour.

2.2 Empirical findings on travel and lifestyles

The results of various research projects reveal that when the concept of life or mobility styles is included in the research and related to traffic behaviour, one finds a scattered picture of recurrent interactions with the latter.

Looking at previous research, the approach of mobility styles was first applied by the 'Institute for Social-Ecological Research/ Frankfurt, Main', with a special focus on reducing the environmental impacts of leisure and tourism travel (for leisure mobility see Götz *et al.*, 2003, 1997, for travel in general). One of the research goals was to estimate the environmental effects of travel behaviour in a way that is lifestyle-specific. For these purposes a CO₂-emission model

was combined with the travel behaviour data of the lifestyle groups. For a German sample they concluded that a lifestyle-specific grouping is helpful in understanding the complexity and disparity of mobility orientations. Based on their five types of mobility styles they were able to develop group-specific measures, recommendations and offers which may influence behaviour in the interests of sustainability. Subsequent to this project, the mobility style approach was applied to mobility styles in leisure, which were considered to be an interesting focus.

A further study on mobility styles, also concentrating on mobility and leisure activity, was undertaken for four neighbourhoods in Cologne, Germany. Lanzendorf (2002) observed a correlation between mobility styles and travel participation, travel frequency, and car use for leisure travel at the weekend. Moreover, using multivariate analysis it can be shown that mobility styles largely explain people's participation in travel for different leisure purposes and the distance travelled by car.

Bamberg and Schmidt (1994) applied the theory of planned behaviour to explain people's choice of travel mode. The theory of planned behaviour is an approach with which to research the link between attitudes and behaviour (Ajzen, 1980). According to this approach, a specific behaviour results from the complex interplay between attitude, subjective norm, and motivation. In fact, Bamberg and Schmidt (1994) predict students' intention to travel to their university lectures by car or bicycle by applying structural equation models. They can explain nearly 80 percent of the variance in people's intention to use a car or bicycle by referring to attitude, subjective norm, and motivation. Despite showing how mode choice – amongst other things – is affected by attitudes towards much-frequented destinations, they do not focus on activity and destination choice.

Scheiner and Holz-Rau (2007) discuss theoretical considerations concerning the links between life situation, lifestyle, choice of residential location and travel behaviour. For the survey area of Cologne their results indicate that, when testing for socioeconomic factors, lifestyles admittedly appear to have a significant influence on mode choice, while changes to the strength of impact are somewhat negligible.

For Switzerland, Lücking and Meyrat-Schlee (1994) worked with a simplified 'lifestyle approach'. They develop lifestyles according to socio-demographic characteristics in combination with information on the course of people's lives. For leisure travel in urban areas they also find that lifestyles have a small but significant effect on mode choice.

The focus on lifestyles has also become established in US American research. Salomon and Ben-Akiva (1983) utilise the concept of lifestyles to estimate models for the combinations of chosen modes and shopping destinations. The results demonstrate that the lifestyle groups account for taste variations better than the classical explanatory factors found in the vertical dimension of social stratification. Like others, this early branch of research faces the disadvan-

tage of not defining lifestyle according to mobility and leisure orientations. Instead, Salomon and Ben-Akiva (1983) define lifestyle groups by using individual and household items as proxy variables.

In summary we have shown that in various research projects the concept of lifestyle has been included in the conceptual and empirical research framework to explain travel behaviour. These different approaches vary in the way they operationalise lifestyle. One problem might be that in many empirical frameworks the concept of lifestyles was operationalised using various proxy variables taken from a real-life situation. One can argue that such operationalisations do not capture the dimension of lifestyle properly. This concept may be seen as a proxy for indicating lifestyles, but, contrarily, we argue that lifestyles or mobility styles can best be captured by rating statements on motivations and orientations concerning different aspects on mobility and leisure activities. The former concept, however, neglects the potential of people's orientations, values, and attitudes regarding mobility and travel as measurement variables for the latent construct of lifestyle.

Moreover, the approach of mobility styles in leisure time has seldom been applied in current research. In fact, as far as the authors are aware, this approach has not yet been carried out in Switzerland. In the following sections we focus on the Swiss empirical findings and set the results against the background of recent findings in the field of transportation research.

3 The data

The first aim of the project was to define statements of values, orientations, and opinions with regard to leisure and travel behaviour. Secondly, a study design was developed to clarify the population for which we wish to construct mobility styles in leisure. One objective of the project is to develop measures leading to sustainable leisure travel. We argue that the biggest potential for helping people move in a more sustainable way exists within urban areas. We therefore applied the agglomeration definition for Switzerland as defined by the Federal Offices for Spatial Development (ARE) and Statistic (BfS) for the framework of the study (ARE/BfS, 2003). Finally a questionnaire was developed and tested for the agglomerations in the German and French-speaking parts of Switzerland; the survey was carried out by the field institute. A representative survey was collected from June to July 2007 (CATI¹). A total of 823 respondents were interviewed (response rate 26 %). This research is restricted to the Swiss urban population living in the French and German-speaking parts aged 18 and older (see Ohnmacht *et al.*, 2008, for more details).

The questionnaire consisted of six parts: the first comprised a detailed list of regu-

¹Computer Assisted Telephone Interview

lar leisure pursuits based on an item list developed by Opaschowski for Germany (BAT-Freizeitforschungsinstitut, 2004). This list was marginally altered, adapted and validated for Switzerland by three Swiss experts (see items in Table 1). It operationalises statements on values, orientations, and opinions with regard to leisure activities, both indoors and outdoors. Secondly, we used the same detailed list to establish preferred leisure activities. For the third section an item list concerning mobility orientations was developed; it is constructed on the basis of items previously used in transportation research (Götz *et al.*, 2003). This gave rise to four groups of items concerning orientations towards car, public transport, bicycles, walking, and multi-modality (see list in Table 2). Fourth, we examined the trips of the interviewees, who were asked to report all trips made on the preceding day, and compared the results with those of other travel surveys (mainly ARE/BfS, 2007). Fifth, an individual personal survey was included, covering various socio-demographic characteristics and household data. The sixth section deals with access to and availability of transport modes.

4 Constructing mobility styles in leisure time

In the following we discuss how to achieve an adequate grouping of individuals based on their attitudes. We argue that leisure travel can be explained more effectively in relation to basic orientations and attitudes of social groups: this was operationalised on the basis of preferred leisure activities and mobility-orientations. To construct the mobility styles, the orientation items for mobility and leisure time were selected from the questionnaire, followed by factor analysis, and, finally cluster analysis.

For factor analysis, VARIMAX rotation with Kaiser criteria was used (see Backhaus *et al.*, 2006, for methodological issues). Overall, we extract 13 factors from 43 leisure activities explaining 55.5 % of the variance (see Table 1). By the same method, nine factors were extracted for mobility orientations from the 33 items on mode attributes which explain 57.2 % of the variance as represented in Table 2.

A cluster analysis was conducted on the basis of the 21 factor-variables (12 leisure orientation factors and 9 mobility orientation factors, for their interpretation see Table 3). The task of a cluster analysis is to generate clusters (groups of cases) that are relatively homogeneous within and heterogeneous in relation to other clusters (see Backhaus *et al.*, 2006, for methodological issues). The ward algorithm in combination with the K-means algorithm was used. This orientation-based clustering has led to the identification of 4 groups. The decision for four groups was made after comparing with various other cluster solutions and being judged the best solution to allow plentiful scope for interpretation.

The four mobility styles were described according to their cluster centres (Table 4) and their

socio-economic and socio-spatial characteristics (Table 5). In order to clarify their cluster-specific differentiation in terms of their social situation we labelled the mobility styles with characteristic names: 'The Sporty Types' (SPO) with an affinity for bicycles (28 % of population in urban areas), 'The Fun and Distraction Seekers' (FUN), who are car fans (16 %), 'The Culture Oriented' (CUL), who are multimodal and critical of cars (33 %), and 'The Neighbourly Home-Lovers' (HOME) with an affinity for cars and public transport (22 %).

They were differentiated by characteristics on the basis of statistically significant deviation from the mean over all cases. Several relationships between personal and household characteristics, local information, and availability of transport modes concerning the mobility styles will be mentioned in the following descriptions.

4.1 'The Sporty Types' (SPO)

As the name implies, 'The Sporty Types' (SPO) (28 % of respondents) appreciates active sports such as cycling, winter sports, and hiking as well as passive sports such as visiting a sports event. Members of this group enjoy using the Internet. They are not into passive forms of leisure activity such as idle relaxation or watching television. The bicycle is a popular form of transport but this type also favours the car for long-distant journeys. Its members dislike walking which seems inconsistent with their sporty and dynamic lifestyle because they consider walking too slow. Representatives of this group are more frequently men (58 %) and are more likely to be found in the younger groups aged 18 to 29 years (33.5 %). A relatively large share (42.8 %) compared to the average live in households with children. Furthermore, 'The Sporty Type' (SPO) is to be found in the German-speaking parts of Switzerland (86.7 %). This type occurs more in high-income household groups (CHF 6,000 to 10,000, 36.4 %), and is rarely interested in high culture in terms of opera and theatre. Furthermore, most of the households have at least one bicycle.

Table 1: Twelve extracted factors for leisure orientations

| Leisure Activities | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Spending time with kin | 9 | -7 | 32 | -8 | 4 | 2 | 11 | 4 | 12 | 55 | 9 | -8 |
| Spending time with friends | 11 | 30 | 53 | -8 | -2 | -12 | 14 | -6 | 27 | 26 | 9 | -1 |
| Meeting people at home | 4 | 39 | 46 | -22 | 2 | -8 | 27 | -2 | 20 | 24 | 12 | 2 |
| Partying | 6 | 71 | 21 | 11 | -1 | 2 | 12 | 10 | 4 | 1 | -9 | 0 |
| Gardening | 3 | -5 | 9 | -15 | 6 | 7 | 71 | 1 | 5 | 15 | 1 | 14 |
| Weekend home | 25 | 1 | 0 | 10 | 12 | -1 | 57 | 15 | 16 | -3 | -16 | -1 |
| Home improvement (DIY) | 0 | 15 | 0 | 13 | 6 | 7 | 62 | -11 | -11 | 18 | 5 | 9 |
| Board games | 5 | 12 | -1 | 9 | -12 | 14 | 17 | 4 | 2 | 68 | -1 | 5 |
| Making music | 0 | 19 | 6 | -9 | 21 | 37 | 7 | 6 | 1 | -4 | 6 | 54 |
| Having a rest/being lazy | -3 | 4 | 12 | 14 | 2 | -3 | -1 | -10 | 75 | 12 | 3 | -1 |
| Personal care | -2 | 13 | 2 | -2 | 3 | -3 | 11 | 23 | 65 | -4 | 12 | 9 |
| Watching TV, DVD | -21 | 4 | 25 | 46 | -22 | 15 | 9 | 12 | 18 | -20 | 18 | -13 |
| Listening to music | 15 | 10 | 42 | 12 | 12 | -7 | -17 | -10 | 21 | -1 | 47 | 32 |
| Listening to radio | -1 | 5 | 7 | -7 | 12 | 6 | -1 | 11 | 9 | 4 | 74 | 2 |
| Newspaper, magazine | 7 | 2 | 13 | -11 | 19 | 14 | -5 | -5 | 15 | 8 | 29 | -45 |
| Books | -6 | -9 | 6 | -29 | 52 | 9 | -3 | 13 | 38 | 11 | -3 | -1 |
| Computer games | 0 | -3 | 19 | 71 | -2 | -11 | -6 | 0 | 2 | 22 | -8 | 7 |
| Surfing in the internet | 29 | 6 | 65 | 22 | 14 | 1 | -6 | 13 | -15 | 7 | -6 | -2 |
| Private phoning | -4 | 9 | 67 | 4 | 1 | 15 | 5 | 21 | 7 | 1 | 4 | -1 |
| Attending a fair | 1 | 56 | -23 | 19 | 6 | 20 | 10 | 10 | -6 | 17 | 27 | -12 |
| Cinema | 23 | 14 | 26 | 6 | 20 | -12 | -13 | 45 | 4 | -3 | 5 | -4 |
| Opera, theatre, concerts | 6 | 6 | -4 | -3 | 74 | 11 | 12 | -4 | 1 | -11 | 12 | -5 |
| Rock, pop, jazz | 27 | 52 | 12 | -5 | 16 | -3 | -6 | 9 | 3 | -1 | 17 | 24 |
| Museum, art | -5 | -1 | 10 | -8 | 79 | -4 | 15 | 8 | -5 | 1 | 6 | 0 |
| Further education | 34 | 23 | 15 | 2 | 35 | 8 | -19 | 15 | 7 | 30 | -17 | 13 |
| Bar, restaurant, café | -4 | 43 | 14 | 17 | 7 | -3 | -5 | 21 | 27 | 8 | 8 | -26 |
| Dancing, disco, clubbing | 11 | 51 | 22 | 10 | -17 | -1 | -13 | 26 | 11 | -5 | 1 | 31 |
| Church service, cemetery | -4 | -11 | 0 | -2 | -4 | 81 | 6 | -4 | 1 | 5 | 10 | -5 |
| Doing community work | 15 | 3 | 5 | -1 | 7 | 81 | 1 | 7 | 4 | 0 | -5 | 4 |
| Clubs | 20 | 24 | 1 | -12 | 13 | 52 | 6 | 0 | -25 | 20 | 5 | -3 |
| Cycling, mountain biking | 54 | -24 | 4 | -10 | -1 | 1 | 10 | 23 | -3 | 21 | 16 | -6 |
| Hiking | 20 | -13 | 3 | -44 | 28 | 2 | 38 | 2 | 12 | 14 | 6 | -13 |
| Swimming | 11 | 11 | 8 | -10 | -9 | 0 | 11 | 61 | -18 | 16 | 15 | 8 |
| Sauna, spa | 12 | 12 | -7 | 4 | 15 | 15 | -10 | 59 | 21 | 10 | -15 | 8 |
| Cruising by car or motorcycle | 9 | 21 | -8 | 67 | -8 | -5 | 10 | 5 | 11 | -4 | 3 | 7 |
| Pleasure trips on weekends | 19 | 19 | 11 | -29 | 16 | -10 | 20 | 36 | 12 | 32 | 5 | -8 |
| Shopping, malling | -10 | 7 | 25 | 27 | -3 | 1 | 6 | 53 | 13 | -12 | 17 | -6 |
| Attending sports events | 38 | 23 | -16 | 26 | -22 | 6 | -7 | 10 | 1 | 12 | 43 | -16 |
| Leisure parks | -3 | 4 | -9 | 31 | 12 | 4 | 25 | 23 | -7 | 43 | 35 | 13 |
| Winter sports | 70 | 9 | 2 | -1 | -5 | 15 | 6 | 0 | -5 | 8 | 8 | -2 |
| Outdoor activities | 56 | 22 | -1 | -11 | 15 | -5 | 21 | 0 | -20 | -19 | -3 | 7 |
| Other sports activities | 67 | 8 | 16 | 5 | 0 | 7 | 3 | 7 | 9 | 3 | -8 | 1 |
| Pets | -1 | -4 | -1 | 18 | -6 | -10 | 26 | -1 | 20 | 15 | 14 | 59 |

Question: How important are the following leisure activities to you?

Scale from 4 to 1; (4) very important, (3) important, (2) less important, (1) not important, n=823

rotated component matrix, factor loadings multiplied by 100, factor loadings above +/- .40 printed in bold type

Table 2: Nine extracted factors for mobility orientations

| Mobility orientations | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 |
|---|------------|------------|-----------|------------|------------|-----------|-----------|-----------|------------|
| Car | | | | | | | | | |
| I feel independent with a car | 71 | -3 | 3 | -19 | -8 | 6 | -18 | -2 | 5 |
| Without a car I can't handle my daily life | 69 | -17 | -8 | -16 | -1 | -6 | 7 | 27 | -3 |
| Without a car one is seen as irrelevant in society | 6 | -5 | -5 | -7 | 2 | 59 | 20 | 2 | -10 |
| Most recent cars are too big, fast, and heavy | -5 | 12 | 16 | 14 | 15 | -8 | 65 | 11 | -2 |
| People who know what life is all about have a car | 52 | -15 | -2 | -1 | 4 | 36 | 0 | 1 | -1 |
| A bit of risk is part of the attraction of driving | 11 | 7 | 19 | 14 | 0 | 55 | -36 | 2 | 0 |
| Leisure activities are not possible without a car | 72 | -16 | -9 | 4 | -7 | 9 | -5 | 8 | 2 |
| If possible, I use public transport instead of a car | -47 | 23 | 32 | 26 | 13 | 0 | 17 | -5 | 10 |
| People who drive a lot should be made to pay more for environmental damages | -26 | 20 | 5 | 14 | -4 | -1 | 65 | -2 | -5 |
| Cars are the best way to get around | 71 | -8 | -19 | -19 | -15 | 9 | -14 | -2 | 13 |
| Public Transport (PT) | | | | | | | | | |
| PT is good for relaxation | 1 | 8 | 21 | 70 | 10 | -13 | 9 | -5 | -5 |
| I prefer PT in order to get in touch with others | -24 | 17 | 1 | 69 | -1 | 19 | 8 | 5 | 14 |
| I prefer PT because I can do other things while travelling (phoning etc.) | -34 | 5 | 29 | 53 | 6 | 1 | 13 | -3 | -1 |
| PT is too inflexible for me | 29 | -4 | -14 | -27 | -7 | 6 | -3 | 64 | 13 |
| Transfer to other trains, buses is annoying | 22 | -4 | -6 | -48 | -24 | 22 | 2 | 31 | 14 |
| It bothers me that I am confronted with awkward people on PT | -2 | -1 | -1 | -49 | -4 | 28 | -6 | 18 | 42 |
| For my situation I'd like to see a better PT system | 6 | -1 | 8 | 3 | -3 | 0 | 7 | 86 | 4 |
| Too much money is invested in PT | 7 | -7 | -22 | -10 | -6 | 57 | -17 | 2 | 1 |
| Bicycle | | | | | | | | | |
| A bicycle for me stands for freedom and independence | -2 | 77 | 5 | 5 | 5 | -2 | 3 | 2 | -2 |
| Bicycle are the best way of getting around | -19 | 76 | -1 | 10 | -2 | 12 | 17 | -10 | 2 |
| Bicycle riders behave inconsiderately in road traffic | 5 | -1 | 6 | -11 | 10 | -5 | -2 | 7 | 71 |
| I feel in danger on a bicycle | 14 | -36 | 7 | -5 | 5 | 26 | 38 | -13 | 41 |
| I sometimes ride across the red traffic light on my bicycle | -11 | 5 | 25 | -21 | -14 | 31 | 11 | -7 | -51 |
| For me, riding a bicycle is exhausting and inconvenient | 9 | -69 | -4 | 0 | -17 | 22 | 14 | -9 | 25 |
| For me, a bicycle is the ideal mode of transport as I can handle short destinations | -12 | 79 | 9 | 9 | -1 | -3 | 14 | -3 | 4 |
| Walking | | | | | | | | | |
| I like walking | 0 | 7 | 12 | 18 | 79 | -2 | 17 | 1 | 7 |
| Walking is too slow | 20 | 2 | -2 | -5 | -74 | 11 | 10 | 11 | -3 |
| I like to walk greater distances in general | -12 | 7 | 14 | 1 | 82 | 8 | 7 | -1 | 7 |
| I only enjoy walking in a leisure context (hiking etc.) | 33 | 6 | -7 | 6 | -17 | -6 | 5 | 13 | 22 |
| Multi-modality | | | | | | | | | |
| I'm not fixed on a distinct mode of transport; my mode choice depends on the situation | -6 | 8 | 79 | 0 | 11 | -2 | 8 | 2 | -15 |
| It goes without saying that I choose my mode of transport depending on the situation | -17 | 4 | 77 | 15 | 8 | 0 | 0 | 4 | -4 |
| It's important to me to combine public transport and bicycle | -19 | 48 | 36 | 9 | -5 | -6 | 19 | -11 | 23 |
| It's perfect that you can combine various modes of transport | -10 | 6 | 65 | 27 | 13 | -16 | 9 | -9 | 21 |
| <i>Question: Do you agree with following statements?</i> | | | | | | | | | |
| Scale from 4 to 1; (4) fully agree, (3) agree, (2) disagree, (1) fully disagree, n=823 | | | | | | | | | |
| rotated component matrix, factor loadings multiplied by 100, factor loadings above +/-0.40 printed in bold type | | | | | | | | | |

Table 3: Interpretation of extracted factors – Leisure & mobility orientations

| Factors with leisure orientations (lo) | | Factors with mobility orientations (mo) | |
|--|---|---|---------------------------------|
| | <i>Interpretation</i> | | <i>Interpretation</i> |
| F1 _{lo} | Active sports | F1 _{mo} | Attraction of car |
| F2 _{lo} | Fun & entertainment | F2 _{mo} | Attraction of bicycles |
| F3 _{lo} | Active networking with ICT and face-to-face | F3 _{mo} | Multi-modality |
| F4 _{lo} | Escapism with media | F4 _{mo} | Attraction of public transport |
| F5 _{lo} | High culture | F5 _{mo} | Attraction of walking |
| F6 _{lo} | Volunteer work | F6 _{mo} | Cars benefit social integration |
| F7 _{lo} | House, garden, home improvement (DIY) | F7 _{mo} | Critical of cars |
| F8 _{lo} | Wellness and outfit | F8 _{mo} | Critical of public transport |
| F9 _{lo} | Relaxation | F9 _{mo} | Frightened by traffic |
| F10 _{lo} | Leisure with family | | |
| F11 _{lo} | Listening to music | | |
| F12 _{lo} | Leisure at home | | |

4.2 'The Fun and Distraction Seekers' (FUN)

'The Fun and Distraction Seekers' (FUN) (16 % of respondents) are somewhat young and technically minded (18-29 years, 48.5 %). They are oriented towards entertainment electronics, such as personal computers and television. They may also be characterised by a tendency to spend their leisure time on idle relaxation. Hanging out with friends is an important means of maintaining their social networks. They enjoy partying or going to restaurants, pubs, bars, or cafés in the company of friends. Moreover, this type has a very strong affinity to the car and shuns other modes of transport. For them, the car is not only for locomotion but is also a form of material prestige and a symbol of social integration. A disproportionately large number live in the French-speaking part of Switzerland considering its share of the Swiss population (31.6 %). Furthermore, this type frequently lives in bigger agglomerations with more than 200,000 citizens (61.9 %). Per household they have fewer bicycles and are less likely to make regular use of public transport than average.

4.3 'The Culture Oriented' (CUL)

A distinctive feature of the 'The Culture Oriented' (CUL) (33 % of respondents) is their high educational attainment (tertiary educational attainment of 36.6 %). Representatives of this group enjoy various leisure activities: playing and listening to music, visiting exhibitions or galleries, reading books, and attending further education. Moreover, this group is actively committed to community work. Representatives of this group predominantly favour walking, biking, and the use of public transport to participate in leisure activities. Their criticism of

Table 4: Cluster centres of mobility styles in leisure time

| | | SPO | FUN | CUL | HOME |
|---|--|-------------|-------------|-------------|------------|
| <i>Factors with leisure orientations</i> | | | | | |
| F1 | Active sports | .33 | -.12 | .21 | -.63 |
| F2 | Fun & entertainment | -.18 | .14 | -.14 | .33 |
| F3 | Active networking with ICT and face-to-face | .09 | .38 | .09 | -.51 |
| F4 | Escapism with media | -.27 | .89 | -.44 | .36 |
| F5 | High culture | -.66 | -.42 | .70 | .07 |
| F6 | Volunteer work | .01 | -.29 | .04 | .13 |
| F7 | House, garden, home improvement | -.17 | -.13 | -.13 | .50 |
| F8 | Wellness and outfit | .23 | -.58 | -.12 | .30 |
| F9 | Relaxation | -.59 | .41 | .26 | .05 |
| F10 | Leisure with family | .13 | -.22 | -.11 | .17 |
| F11 | Listening to music | -.01 | -.58 | .13 | .22 |
| F12 | Leisure at home | -.31 | .14 | .21 | -.03 |
| <i>Factors with mobility orientations</i> | | | | | |
| F1 | Attraction of car | -.05 | .16 | -.25 | .32 |
| F2 | Attraction of bicycless | .50 | -.37 | .12 | -.53 |
| F3 | Multi-modality | -.09 | -.21 | .03 | .21 |
| F4 | Attraction of public transport | .01 | -.89 | .09 | .47 |
| F5 | Attraction of walking | -.52 | -.56 | .55 | .19 |
| F6 | Cars benefit social integration | -.41 | .45 | -.16 | .42 |
| F7 | Car criticism | -.08 | -.58 | .52 | -.28 |
| F8 | Critical of car | .02 | .06 | .16 | -.31 |
| F9 | Critical of public transport | -.20 | -.09 | -.09 | .46 |
| Bold type: High deviations of factor mean from cluster centre | | | | | |
| Note: 'SPO=The Sporty Types'; FUN='The Fun and Distraction Seekers' | | | | | |
| CUL='The Culture Oriented'; HOME='The Neighbourly Home-Lovers' | | | | | |

the car stems from ecological considerations. This group includes a disproportionately high number of women (56.9 %). Its members are more likely to come from the middle age groups of 30 to 59 years (73.3 %). These people live in households with children to a lesser extent than average (27.7 %). Furthermore, this type is found slightly more often in the French-speaking part of Switzerland (45.7 %). They have more bicycles per household than average and more often make regular use of public transport.

4.4 'The Neighbourly Home-Lovers' (HOME)

The Neighbourly Home-Lovers' may best be typified as a tradition-oriented kind of group (see Plöger, 2006). This type of person values family and a sense of security, and is mainly

characterised by their domestic and neighbourly orientation. Within this group we can find a gender divide: Firstly, while the men prefer to engage in gardening and home improvement in their leisure time, the women like to indulge in shopping as a leisure time experience. Secondly, while the men's preferred mode of transport is the car, which they rate as a sign of social integration, the women prefer to use public transport. Both men and women dislike the idea of cycling and consider it exhausting, inconvenient, and dangerous, a fact which is also reflected in the lower number of bicycles per household. Overall, this type is characterised by a high degree of sociability. Their favourite pastimes are visiting restaurants and playing cards in the company of friends. Overrepresented in this group are women (55.4 %) and older people (60+ years, 26.8 %), and people on a middle income (CHF 4,000-6,000, 29.5 %). Furthermore, they are more likely to be found in the French-speaking part of Switzerland (67.6 %).

Table 5: Mobility styles by personal and household characteristics, local information, and availability of transportation modes in %

| | SPO | FUN | CUL | HOME | Total |
|--|------|------|------|------|-------|
| Personal and household characteristics | | | | | |
| Men | 57.7 | 59.0 | 43.1 | 44.6 | 50.0 |
| Age | | | | | |
| 18-29 years | 33.5 | 48.9 | 15.2 | 18.4 | 26.4 |
| 30-59 years | 57.7 | 41.9 | 73.3 | 54.8 | 59.8 |
| 60+ years | 8.8 | 9.2 | 11.4 | 26.8 | 13.8 |
| Net household income | | | | | |
| Below CHF 2'000 | 1.2 | 4.7 | 1.9 | 2.9 | 2.4 |
| CHF 2'000-4'000 | 11.0 | 12.8 | 8.5 | 11.6 | 10.6 |
| CHF 4'001-6'000 | 12.7 | 18.6 | 22.7 | 29.5 | 20.8 |
| CHF 6'001-10'000 | 36.4 | 18.1 | 37.1 | 28.5 | 31.9 |
| Above CHF 10'000 | 27.7 | 19.6 | 21.6 | 11.2 | 20.6 |
| Educational attainment | | | | | |
| primary | 11.1 | 21.1 | 5.0 | 14.0 | 11.2 |
| secondary | 65.6 | 57.7 | 58.4 | 68.8 | 62.1 |
| tertiary | 23.3 | 21.2 | 36.6 | 17.3 | 26.1 |
| 3 and more person living in household | 22.6 | 31.8 | 18.4 | 18.3 | 21.7 |
| Person lives in a partnership | 75.1 | 62.4 | 71.7 | 74.3 | 71.7 |
| Child under 18 in household | 42.3 | 32.6 | 27.7 | 31.5 | 33.4 |
| Local information | | | | | |
| German-speaking part | 86.7 | 69.4 | 73.8 | 67.9 | 75.3 |
| Size of agglomeration | | | | | |
| 200'000+ | 47.4 | 61.9 | 57.4 | 52.9 | 54.3 |
| 50'000-199'999 | 39.9 | 23.9 | 33.2 | 33.8 | 33.7 |
| up to 49'999 | 12.7 | 14.2 | 9.4 | 13.3 | 11.9 |
| Lives in agglomeration centre | 36.6 | 44.7 | 45.7 | 32.4 | 39.9 |
| Availability of transport modes | | | | | |
| Bicycle in household | 96.2 | 71.8 | 89.4 | 72.8 | 84.7 |
| Car in household | 84.0 | 85.5 | 71.7 | 78.1 | 78.8 |
| Car-sharing member | 2.7 | 3.7 | 3.6 | 0.6 | 2.7 |
| Subscription to public transport | 65.6 | 45.9 | 77.4 | 60.5 | 65.3 |
| All the cross-tables are significant with $p < 0.05$ (chi-square-test) | | | | | |
| Reading example: 84 % of 'The Sporty Types' (SPO) have a car in their households | | | | | |
| Note: 'SPO='The Sporty Types'; FUN='The Fun and Distraction Seekers' | | | | | |
| CUL='The Culture Oriented'; HOME='The Neighbourly Home-Lovers' | | | | | |

5 Mobility styles and their relation to travel behaviour

5.1 Bivariate results

The data for traffic behaviour were evaluated once the typology had been fixed. To measure bivariate effects of mobility styles on travel, various indicators were used as demonstrated in Table 6. A dichotomised variable was computed to indicate whether a person participated in travel the day before the survey. The results showed significant differences in travel according to type (chi-square test). In fact, comparing all mobility styles the 'The Sporty Types' (SPO) were more likely to have participated in travel, followed by 'The Fun and Distraction Seekers' (FUN), 'The Neighbourly Home-Lovers' (HOME), and 'The Culture Oriented' (CUL). We applied a one-way ANOVA procedure (F-test) to test the H_0 -Hypothesis that the means of the variables with interval scale are equal according to cross-tabulation with the mobility-style groups. Furthermore, we tested whether the variances of the groups are equivalent to fulfilling an important assumption of the F-test.

The H_0 -Hypothesis can be rejected for travel distance in total [km] as well as for leisure travel distance [km]. Interestingly, the group of 'The Sporty Types' (SPO) travels most, whereas the differences between the other groups are quite minimal. Contrary to expectation, 'The Neighbourly Home-Lovers' (HOME) travel most in terms of leisure travel. One explanation might be that their share of walking for leisure is rather low and their share of car usage in leisure time is rather high.

The number of trips, both for leisure and in general, and the duration of the trip, both for leisure and in general, do not differ significantly among all types in bivariate analysis. With regard to leisure activities the mobility style groups differ only in the frequency of participation in active sports. As expected, it is the group of 'The Sporty Types' (SPO) who are most active in sports, followed by the 'The Culture Oriented' (CUL). No further significant differences between the mobility style groups are observed, especially with regard to the following leisure activities: visiting restaurants, hiking, visiting friends and relatives.

In general, there are significant differences with regard to mode share for car, bicycle, walking and public transport. 'The Fun and Distraction Seekers' (FUN) have the highest overall car share, both against travel distance and modal choice. As expected, 'The Sporty Types' (SPO) lead the field with regard to frequency of bicycle trips and share of bicycle against travel distance, trips and leisure trips. Interestingly, in terms of walking it becomes obvious that 'The Neighbourly Home-Lovers' (HOME) have the highest share of walking against travel distance, but they do not walk in leisure time at all. As already discussed above, this might explain their high travel distance for leisure. In fact, 'The Culture Oriented' (CUL) are those who travel longest with public transport and also have the highest share of public transport. One can con-

clude that the greatest differences between mobility styles is their degree of participation in travel and the way they use modes of transport in general and for leisure in particular. There are only minor significant differences in leisure activities. Although we discovered significant differences according to bivariate analysis it can be argued that this is only due to effects lying behind the correlations. Hence, to control for other variables, we will apply multivariate methods to test the validity in the following.

Table 6: Mobility styles by various travel indicators

| | SPO | FUN | CUL | HOME | Total |
|--|-------------|-------------|-------------|-------------|-------|
| Key figures of travel: Frequency, travel distance, and duration | | | | | |
| Participated in travel [in %] | 87.6 | 79.5 | 65.7 | 67.2 | 88.7 |
| Frequency of trips [n] | 3.4 | 3.4 | 3.4 | 3.0 | 3.3 |
| Frequency of leisure trips [n] | 0.7 | 0.6 | 0.6 | 0.5 | 0.6 |
| Travel distance in total [km] | 42.9 | 35.5 | 35.4 | 34.3 | 37.4 |
| Travel distance for leisure [km] | 12.2 | 5.1 | 6.1 | 22.7 | 10.0 |
| Duration of trips [min] | 81.8 | 76.0 | 84.0 | 93.1 | 84.1 |
| Duration of leisure trips [min] | 55.7 | 55.1 | 48.2 | 87.4 | 59.6 |
| Leisure activities | | | | | |
| Active sport [n] | 0.12 | 0.05 | 0.10 | 0.02 | 0.08 |
| Visiting restaurants [n] | 0.06 | 0.07 | 0.04 | 0.07 | 0.05 |
| Hiking [n] | 0.12 | 0.10 | 0.07 | 0.10 | 0.10 |
| Visiting friends and relatives [n] | 0.13 | 0.16 | 0.18 | 0.18 | 0.16 |
| Walking outdoors [n] | 1.00 | 1.21 | 1.14 | 1.63 | 1.25 |
| Selected figures based on significant differences | | | | | |
| <i>Car</i> | | | | | |
| Share of car on travel distance [in %] | 59.0 | 71.4 | 40.1 | 58.9 | 54.7 |
| Share of car on trips [in %] | 50.2 | 55.7 | 32.0 | 44.1 | 43.6 |
| <i>Bicycle</i> | | | | | |
| Frequency of bicycle trips | 0.47 | 0.10 | 0.40 | 0.05 | 0.03 |
| Share of bicycle on travel distance [in %] | 12.2 | 1.9 | 12.1 | 2.2 | 8.0 |
| Share of bicycle on trips [in %] | 12.8 | 2.2 | 10.0 | 1.0 | 8.9 |
| Share of bicycle on leisure trips [in %] | 7.1 | 1.3 | 3.1 | 0.1 | 3.2 |
| <i>Walking</i> | | | | | |
| Share of walking on travel distance [in %] | 10.5 | 11.7 | 16.4 | 20.1 | 14.7 |
| Share of walking on leisure distance [in %] | 7.0 | 1.0 | 4.5 | 0.0 | 3.7 |
| <i>Public Transport (PT)</i> | | | | | |
| Travel distance PT | 8.8 | 2.6 | 10.8 | 6.5 | 8.0 |
| Share of PT on trips [in %] | 18.2 | 9.0 | 25.7 | 17.4 | 19.1 |
| Significant figures on the 0.05 level printed in bold type | | | | | |
| Chi-square test for participation in travel; F-Test for rest. | | | | | |
| <i>Note:</i> 'SPO=The Sporty Types'; FUN='The Fun and Distraction Seekers' | | | | | |
| CUL='The Culture Oriented'; HOME='The Neighbourly Home-Lovers' | | | | | |

5.2 Multivariate results

We are interested in how these four groups tie in with empirical observations on travel behaviour. This means we examine the hypotheses of a relationship between mobility orientations and traffic behaviour. With the assistance of multivariate analysis we are able to analyse

whether leisure mobility orientations effect travel behaviour, whilst controlling for other factors such as socio-demography, availability of means of transport, and local information.

The multivariate analysis was organised in two steps. Firstly, various logit models were calculated for participation in travel and leisure activities. For continuous variables we applied an ordinary least square (OLS-) regression analysis for mode share on trips and travel distance, both in percentage, and on travel distance for leisure in kilometres.

The results of the logit analysis indicate that only the mobility style 'The Sporty Types' (SPO) is a significant contributor to participation in travel. The odds ratio indicates that this type has a high likelihood of participation in travel. In fact, the odds for participation in travel change by a factor of 2.8 for 'The Sporty Types' (SPO). Furthermore, the likelihood that the same type will participate in the leisure activity 'Visiting friends and relatives' decreases by a factor of 0.5. This means that 'The Sporty Types' (SPO) undertake less travel to visit friends and relatives as compared to 'The Neighbourly Home-Lovers' (HOME). In all other models the mobility styles turn out to be non-significant, which indicates that classical predictors such as income, local information and availability of modes of transport are more relevant.

Table 7: Logit models for participation in travel and for selected journey purposes

| | Participation | VFR | Walking Outside | Active sports | Hiking | Visiting Restaurants |
|------------------------------------|-------------------|--------------------|------------------|---------------------|-------------------|----------------------|
| Men | 0.04 (0.18) | -0.01 (-0.03) | 1.33 (1.25) | 0.22 (0.66) | -0.25 (-0.82) | -0.194 (-0.53) |
| Age | | | | | | |
| 18-29 | 0.49 (1.26) | 0.017 (0.04) | -1.36 (-0.73) | 0.49 (0.67) | 0.18 (0.33) | 1.18 (1.49) |
| 30-59 | 0.73* (2.10) | -0.31 (-0.81) | -1.24 (-0.82) | 0.52 (0.75) | -0.11 (-0.22) | 0.87 (1.14) |
| 66+ [Ref.] | | | | | | |
| Income (CHF) | | | | | | |
| less than 2000 | 0.016 (0.03) | -1.27 (-1.07) | -0.39 (-0.51) | 3.65*** (4.26) | -0.38 (-0.35) | -0.64 (-0.44) |
| 2'000-4'000 | 0.055 (0.13) | -0.72 (-1.29) | 0.81 (0.50) | 0.40 (0.59) | 0.26 (0.46) | -0.51 (-0.63) |
| 4'001-6'000 | 0.22 (0.72) | 0.81* (2.50) | 0.15 (0.12) | 0.15 (0.32) | -0.043 (-0.09) | 0.26 (0.52) |
| 6'001-10'000 | 0.74* (2.17) | -0.066 (-0.21) | -0.95 (-0.65) | 0.35 (0.88) | 0.72 (1.90) | -0.23 (-0.51) |
| 10'001+ [Ref.] | | | | | | |
| Education | | | | | | |
| primary | -0.81 (-1.80) | -0.049 (-0.10) | -1.16 (-0.52) | -0.39 (-0.51) | 0.20 (0.31) | -0.78 (-0.97) |
| secondary | -0.51 (-1.60) | -0.29 (-1.01) | 0.13 (0.11) | -0.052 (-0.14) | 0.64 (1.59) | -0.022 (-0.05) |
| tertiary [Ref.] | | | | | | |
| More than 3 person in HH | -0.16 (-0.53) | 0.68* (2.19) | 0.75 (0.56) | 0.31 (0.73) | 0.15 (0.39) | -0.17 (-0.35) |
| Lives in partnership | -0.22 (-0.82) | 0.25 (0.90) | 1.04 (0.86) | 0.06 (0.15) | 0.15 (0.42) | 0.13 (0.30) |
| Kids in HH | 0.38 (1.31) | -0.52 (-1.72) | 0.87 (0.70) | -0.04 (-0.10) | 0.01 (0.02) | -0.19 (-0.46) |
| Swiss-German | 0.39 (1.50) | 0.44 (1.43) | -0.09 (0.56) | 1.35* (2.19) | -0.22 (-0.62) | -0.61 (-1.51) |
| Citizens in Agglomeration | | | | | | |
| + 200'000 | -0.87 (-1.87) | 0.83 (1.77) | -0.05 (-0.10) | -0.05 (-0.10) | -0.98* (-2.45) | -1.14* (-2.42) |
| 50'000-199'999 | -0.94* (-1.98) | 1.00* (2.11) | 0.88 (1.94) | -0.41 (-0.80) | -0.85* (-2.05) | -1.01* (-2.02) |
| up to 49'999 [Ref.] | | | | | | |
| Lives in centre of Aggl. | -0.14 (-0.59) | 0.49* (1.99) | 1.42 (1.31) | 0.75* (2.29) | -0.09 (-0.31) | 0.06 (0.18) |
| Bicycles in HH | -0.50 (-1.41) | 0.081 (0.21) | -0.89 (-0.72) | 1.37 (1.44) | 0.28 (0.56) | -0.35 (-0.63) |
| Car in HH | 0.42 (1.37) | -0.69* (-2.17) | -0.13 (-0.10) | 0.28 (0.63) | -0.82* (-2.00) | -0.032 (-0.06) |
| Car-sharing member | 0.77 (0.77) | -0.36 (-0.51) | 1.20 (1.77) | 1.33* (2.08) | -0.55 (-0.53) | 0.54 (0.59) |
| Public transport ticket | -0.021 (-0.08) | -0.040 (-0.14) | -0.24 (-0.24) | 0.88 (1.94) | 0.069 (0.21) | 0.33 (0.82) |
| Mobility Styles | | | | | | |
| SPO | 1.14** (2.93) | -0.77* (-2.08) | 1.31 (0.70) | 1.20 (1.77) | 0.05 (0.13) | 0.08 (0.17) |
| FUN | 0.10 (0.30) | -0.10 (-0.25) | 1.59 (0.93) | 0.40 (0.48) | 0.12 (0.25) | 0.19 (0.35) |
| CUL | 0.25 (0.84) | -0.22 (-0.70) | 1.53 (0.97) | 0.95 (1.39) | -0.45 (-1.05) | -0.72 (-1.31) |
| HOME [Ref.] | | | | | | |
| Constant | 2.14* (2.57) | -2.46** (-2.81) | -4.98 (-1.63) | -8.08*** (-5.15) | -1.85 (-1.82) | -2.07 (-1.64) |
| <i>N</i> | 816 | 724 | 724 | 724 | 724 | 724 |
| <i>R</i> ² (Nagelkerke) | 0.11 | 0.13 | 0.27 | 0.19 | 0.07 | 0.07 |

t statistics in parentheses, without parentheses B coefficients

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Participation= Participated in travel; VFR= Visiting friends and relatives; HH= Household

Aggl.= Agglomeration; 'SPO=The Sporty Types'; FUN='The Fun and Distraction Seekers'

CUL='The Culture Oriented'; HOME='The Neighbourly Home-Lovers'

The regression analysis was applied by using the forward stepwise method to generate best-fit models. In all models the mobility styles can be considered as major contributors, especially for car share against trips and travel distances.

The model for leisure travel distance has a rather poorly adjusted R^2 value. Nevertheless the residuals are normally distributed and we controlled for multicollinearity. In contrast, the models to predict bicycle share against trips and car share against trips show a relatively high degree of explanatory variance. For all models we detect a significant impact of mobility styles on the selected travel key figures. For bicycle share against trips we transfer the data with the natural logarithm to receive a better normal distribution of the residuals. Since there is no value for the logarithm of '0' we have only a sub-sample which includes people who participated in bicycle travel. Here, the mobility styles turn out to have the biggest impact in terms of the standardised beta coefficients. In this model the share of bicycles against trips is highest for people in the lowest income class who live in small households in the German-speaking part of Switzerland and belong to the mobility style groups 'The Sporty Types' (SPO) or 'The Culture Oriented' (CUL), taking 'The Neighbourly Home-Lovers' (HOME) as a reference category.

For car share against trips we can draw on the following ideal type with the highest share: fairly highly educated men over the age of 29, living in smaller agglomerations, with a car in their household, not in possession of monthly or annual public transport season tickets, and who feature more strongly among 'The Fun and Distraction Seekers' (FUN) and less in the group of 'The Culture Oriented' (CUL). This result can be mirrored for car share against travel distance, with the exception that the agglomeration size does not turn out to be significant.

Finally, the model for leisure travel distance produced the following result in terms of constructing an ideal type with a high amount of leisure travel: men, mainly found in the 30 to 59-year-old age group, with a middle income of CHF 4,001 to 6,000, fewer under-18s in the household; interestingly, they tend to live in bigger households in the agglomeration belt, and feature less strongly amongst the groups 'The Fun and Distraction Seekers' (FUN) and 'The Culture Oriented' (CUL) according to the reference group 'The Neighbourly Home-Lovers' (Home).

Table 8: OLS-Regression of selected travel key figures (Forward stepwise method)

| | Bicycle Share on Trips (LN) | Car Share on Trips | Car Share on Travel Distance | Travel Distance for Leisure |
|-------------------------------------|-----------------------------------|-----------------------|------------------------------------|--------------------------------|
| Men | - | 0.09** (2.91) | 0.08* (2.32) | 0.10** (2.69) |
| Age | | | | |
| 18-29 | - | -0.13*** (-3.64) | -0.12** (-3.23) | - |
| 30-59 | - | - | - | 0.09* (2.25) |
| 66+ [Ref.] | | | | |
| Income (CHF) | | | | |
| 2'000-4'000 | .25** (2.33) | - | - | - |
| 4'001-6'000 | - | - | - | 0.10** (2.62) |
| 6'001-10'000 | - | - | - | - |
| 10'000+ [Ref.] | | | | |
| Education | | | | |
| primary | - | -0.09** (-2.80) | -0.11** (-3.02) | - |
| tertiary [Ref.] | | | | |
| Kids in HH | - | - | - | -0.14*** (-3.60) |
| More than 3 persons in HH | -0.22* (-2.11) | - | - | 0.16*** (4.12) |
| Swiss-German | 0.25* (2.19) | - | - | - |
| Citizens in Agglomeration | | | | |
| + 200'000 | - | -0.08* (-2.30) | - | - |
| up to 50'000+ [Ref.] | | | | |
| Lives in centre of Agglo. | - | -0.14*** (-4.16) | -0.11** (-3.21) | 0.08* (2.15) |
| Car-sharing member | - | - | - | - |
| Car in household | - | 0.24*** (6.91) | 0.23*** (6.52) | - |
| Public transport seasonal ticket | - | -0.27*** (-8.09) | -0.24*** (-6.77) | - |
| Mobility Styles | | | | |
| SPO | 0.44*** (2.42) | - | - | - |
| FUN | - | 0.09** (2.59) | 0.09* (2.44) | -0.09* (-2.27) |
| CUL | 0.35** (2.00) | -0.09** (-2.63) | -0.09** (-3.24) | -0.10* (-2.49) |
| HOME [Ref.] | | | | |
| N | 73 | 724 | 724 | 724 |
| adj. R ² | 0.18 | 0.29 | 0.26 | 0.06 |

t statistics in parentheses, without parentheses standardized B coefficients

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Note: HH= Household; Aggl.= Agglomeration;

Note: 'SPO='The Sporty Types'; FUN='The Fun and Distraction Seekers'

CUL='The Culture Oriented'; HOME='The Neighbourly Home-Lovers'

6 Conclusions and summary

In this contribution we intend to present the approach of mobility styles in leisure for Swiss agglomerations. Mobility styles can be empirically constructed in a straightforward way using factor and cluster analysis, although the research design and survey process are rather costly and time-consuming. Moreover, interpretation of the styles identified in this way requires insights into the sociological structure of the research fields. We showed that for a better understanding of travel behaviour, it is important to take orientations and attitudes into consideration. In summary, we can ascertain the following:

Attitudinal, motivational, and lifestyle dimensions can make an additional contribution towards clarifying variance in traffic behaviour. Explanations of a purely socio-demographic nature often prove inadequate, because the plurality of basic values leads to the emergence of different value patterns in groups with a similar socio-demographic structure. There is significant correlation between mobility styles and participation in travel, the leisure purpose 'Active sports', the share of car, bicycle, and public transport, based both on distance and trips. If other variables are controlled for, we still can detect significant influences between the mobility styles regarding key figures for travel behaviour. Multivariate analysis indicates that the mobility style dimension can likewise make an additional contribution towards clarifying variance in travel behaviour. Mobility styles in leisure proved to have a significant influence on the following travel figures:

Firstly, participation in travel in general and for the purpose 'Visiting friends and relatives' in particular, bicycle and car share on trips, car share for leisure travel, and travel distance for leisure. The inclusion of mobility styles may lead to more satisfactory ways of explaining travel behaviour, the main advantage being that one is taking account the social realities of individualisation und pluralisation.

Secondly, the fact that these (often) so-called soft factors have an additional influence is recognised virtually throughout all instances of traffic research. With regard to the Swiss Travel Behaviour Microcensus (Swiss National Travel Survey, see ARE/BfS (2007)), it would be worth checking whether attitudinal items should also be taken up by the large traffic panel surveys.

Thirdly, the results from the Swiss Travel Behaviour Microcensus have shown that leisure leads the field of travel purposes (ARE/BfS, 2007). Policymakers and researcher want to know more about leisure travel with regard to greenhouse gas emissions from motorised leisure travel. Thus, knowledge of target-group-specific orientations and motivational factors is helpful in devising methods, and can also be used for 'social marketing' that influences behaviour in the direction of sustainability. In our project, it was possible to derive important correlations between mobility orientations and traffic behaviour – correlations which were quite strong and significant between lifestyle groups and certain characteristic values of traffic behaviour. Based

on the results of this project, we developed a list of group-specific recommendations, measures and offers. The focus lies on the avoidance of trips and a shift towards public transport, cycling and walking (for a list of measures see Ohnmacht *et al.*, forthcoming, p.112-116).

In sum, it is now possible to provide pointers for practical interventions with regard to mobility styles in leisure time for Swiss agglomerations – e.g. sociologically managed traffic and spatial planning. The approach outlined here amounts to an extension of the well-known planning instruments. In fact, anyone wishing to influence leisure mobility and leisure traffic can now take into consideration all three possible influences: the spatial structural, the social and the socio-cultural.

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