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Author(s):
Stauffacher, Michael; Schlich, Robert; Axhausen, Kay W.; Scholz, Roland W.

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The diversity of travel behaviour: motives and social interactions in leisure time activities

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Michael Stauffacher\textsuperscript{1}, Robert Schlich\textsuperscript{2,3}, Kay W. Axhausen\textsuperscript{3}, Roland W. Scholz\textsuperscript{1*}

\textsuperscript{1} Institute of Human-Environment Systems (HES), Swiss Federal Institute of Technology (ETH), Zürich, Switzerland

\textsuperscript{2} Swiss Railway Company (SBB), Bern, Switzerland

\textsuperscript{3} Institute of Transportation Planning and Systems (IVT), Swiss Federal Institute of Technology (ETH), Zürich, Switzerland

* Corresponding author, Email: roland.scholz@env.ethz.ch

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Abstract

Influencing travel behaviour towards a more sustainable form has long been the subject of lively discussion. Whilst some claim that urban form can influence mobility patterns, others stress personal characteristics. Still, psychological factors like personal need and motives (e.g., social interaction, recreation, variety seeking and curiosity) are also relevant, especially for the highly individualistic behaviour of leisure travel, but have been largely neglected in travel behaviour studies. In two longitudinal diary studies of two- and twelve-weeks duration in Switzerland, one in the city of Basel, the second in the agglomeration of Zürich, we investigated the needs that specific leisure activities can satisfy and the role social interactions play in leisure activity. We found that social motives dominate leisure travel, i.e. greater changes in travel demand can only be expected if people reconstruct their social networks, e.g. living closer to friends and relatives.

Keywords

Travel demand, activity, leisure time, need, motive, travel diary
1. Introduction

Sustainable development involves *inter alia* the reduction of resource use. As one fourth of worldwide consumption of energy can be traced back to transportation, 40% in the US, 30% in the EU countries (Marechal *et al.*, 2005), many approaches could be adopted to reduce travel-related energy consumption, i.e. making fewer trips, travelling shorter distances, shifting modal choice to public transport or adoption of more efficient vehicles (the 'four-S' strategy: saving, smoothing, shifting, and substituting, see Lienin *et al.*, 2005, p. 26). Travel-demand management measures can be further differentiated in terms of between coercive and non-coercive, immediate and long term, top-down and bottom-up, push and pull, as well as focussed on local or long-distance travel (Gärling *et al.*, 2002; Loukopoulos, forthcoming; Loukopoulos *et al.*, 2004; Loukopoulos and Scholz, 2004).

The literature so far has emphasised two approaches, which are not mutually exclusive, in attempting to explain the volume and shape of travel demand: a context-related and a person-centred approach. In the former, the influence of land use planning, urban form or the built environment on travel demand is analyzed (for a review, see e.g. Ewing and Cervero, 2001; Giuliano and Narayan, 2003; Handy, 2005; Krizek, 2003; Schwanen *et al.*, 2004); in the latter, individual choice based on activity-planning and personal driving forces such as norms, attitudes, and values, is modelled (for
a review, see e.g. Arentze and Timmermans, 2002; Axhausen and Gärling, 1992; Gärling et al., 1998; Gärling et al., 2002; Schlich, 2004). We will briefly review both lines of reasoning and introduce our own approach together with some specific research questions in the remainder of this chapter.

1.1 The relationship urban form and travel behaviour: the context

Susan Handy counted more than seventy studies from the 1990s exploring the relationship between the built environment and travel behaviour (Handy, 2005; Handy et al., 2002). In the last few years, there have been many more as revealed by a literature search in peer reviewed international journals (see e.g. Dielemann et al., 2002; Schwanen et al., 2004; Snellen et al., 2002; Stead, 2001).

Many studies initially showed a substantial correlation between urban form and individual travel behaviours (see e.g. Banister, 1997, 2000; Cervero, 2002; Dieleman et al., 2002; Giuliano and Narayan, 2003; Krizek, 2003; Newman and Kenworthy 1989, 1991; Stead, 2001). Later studies, however, using additional data and employing more advanced statistical techniques, indicated that socio-demographics are more important or that no effect of the built environment could be observed at all (see e.g. Camagni et al., 2002; Gordon and Richardson, 1997; Schwanen et al., 2004; Snellen et al., 2002). In a meta-analysis, Ewing and Cervero (2001, p. 111) found
statistically significant but rather limited effects of density, diversity and
design factors on number of trips and trip length (elasticity between -0.03 to
-0.05, summing up to -0.13 as these are partial elasticities, see ibid., p. 107),
trip frequency being primarily a function of socio-demographics but trip
lengths of built environment (ibid., p. 106). Additional to socio-
demographics, some studies demonstrated that attitudes and other personal
characteristics are also important (Holden, 2004; Kitamura et al., 1997;
Krizek and Waddell, 2002), but no clear conceptual framework has as yet
been proposed of how these psychological factors and other individual-level
data actually influence travel behaviour, i.e. the mechanism(s) behind it
(causality instead of association, Handy, 2005, p. 162).

1.2 From induced travel demand to individual choice: the person

perspective

Travel behaviour analysis has shifted from aggregated travel models to
individual and activity-based models (e.g. see Arentze and Timmermans,
2002; Axhausen and Gärling, 1992; Schlich, 2004; or Stern and Richardson,
2005). This is due to problems in aggregation, whereby dissimilar
behaviours such as commuting or leisure travel are accumulated and
individual level data is aggregated at district, city or even national levels;
see for example Mokhtarian and Chen (2004) on travel time budgets. This
hides existing inter- as well as intrapersonal variability, inviting the problem
of ecologic fallacy in the further analysis (Handy et al., 2002; Krizek, 2003), whereby an observed association at the group level is probably not present at the individual level. Furthermore, the simplistic and deterministic understanding of human behaviour in many aggregated models of travel demand, describing travel primarily as a derived demand (for a critique of this approach see e.g. Lanzendorf, 2002), has contributed to a change of focus towards the individual and to the understanding of travel as an individual choice. Notwithstanding, individual travel behaviour is not always based on an autonomous and self-conscious choice among different alternatives, but is often habitual, impulsive or constrained by other forces (Gärling et al., 1998; Gärling et al., 2002; Gärling and Axhausen, 2003; Schlich and Axhausen, 2003; Stern and Richardson, 2005).

From the above discussion it should be evident that both approaches (context and person) can and should been linked. Surprisingly, however, this has rarely been done (some notable exceptions: Dieleman et al., 2002; Simma and Axhausen, 2004; Simma et al., 2000; Snellen et al., 2002; Stead, 2001). This very fact is further illustrated by a recently published paper, whose title explicitly states that few of these links are actually known: "Land use and travel behaviours: expected effects from the perspective of utility theory and activity-based approaches" (Maat et al., 2005, emphasis added). Maat et al. argue that "the relationships between urban form and
travel are also likely to become more complex. In addition, travel-demand measures are becoming more complex" (2005, p. 44).

1.3 From planned behaviour to a functional approach

To explain travel demand at the psychological level, researchers usually refer to the theories of reasoned action and planned behaviour by Ajzen and Fishbein (see Gärling et al., 1998), which use attitudes, subjective norms and perceived behavioural control to explain intention and behaviour. Other psychological theories demonstrate the usefulness of need and motives both in explaining behaviour and as important traits for individual well-being (Ryan and Deci, 2001). Deci and Ryan distinguish between autonomy, competence and relatedness as innate basic psychological needs, which people strive to satisfy and which drive individual behaviour (Deci and Ryan, 2000; Ryan and Deci, 2000).

The concepts of motives and need offer a functional view of behaviour: an individual activity is not pursued for its own sake but for a certain motive – be it conscious or non-conscious. The same activity can have different or similar personal motives, e.g. one can go to the cinema to learn about foreign cultures or to meet friends. Hence, this view offers a new perspective of 'functional alternatives' for travel demand management: same function but, for example, different transport and activity pairings, e.g. one would meet friends not in the cinema ten kilometres away but in pub around
the corner. This view is distinct from other views, including the aforementioned 'four-S' strategy (Lienin et al., 2005), as the focus is shifted from travel behaviour to the actual activity being pursued and the motive behind the activity. Such a functional view could as well further the question of social justice as an important element in sustainable development: the unequal possibilities to fulfil his/her needs due to restricted access to travel infrastructure or leisure amenities (Burton, 2003; Floyd and Johnson, 2001; Tarrant and Cordell, 1999).

In a recent review, Stern and Richardson (2005) emphasized the role of motives and needs as a starting point for a decision making process model of travel demand. Gärling and colleagues (2002), offering a conceptual model of travel demand management, also refer to motives and needs as essential in the goal setting process of individual travel choice behaviour. At least in German speaking countries, the role of motives in travel demand has been analysed in several studies (Dietiker and Regli, 1998; Fastenmeier, 2003; Gstalter and Fastenmeier, 2002). Additionally, it is worth looking at the motive ‘variety seeking’, the wish to see something new for its own sake. Variety seeking has been researched in transport very rarely (see for example: Kemperman et al., 2002; Zängler and Karg, 2000).
1.4 Our approach: investigating leisure travel from a functional activity perspective

The few studies examining motives have focussed on leisure travel. This is not surprising given the fact that a wider variety of psychological factors are at work in leisure travel than in commuting – the latter exhibiting rather different mechanisms (Kemperman et al., 2002). Yet, leisure travel has long been neglected in transportation research, as can be ascertained from a literature search in Web of Science, which revealed a limited number of studies (Kemperman et al., 2002; Lawson, 2001; Lanzendorf, 2002; Schlich et al, 2004). Schlich and colleagues (2004) present results from two data sources – the six-week travel diary Mobidrive and the German Mobility panel MOB – both exhibiting longer trip distance and duration in leisure travel than in all other activities. From different studies in Switzerland, Germany, UK and U.S.A. it can be gathered that between 30 and 45% of all person-km are due to leisure activities (see Table 1).

----- about here Table 1 ------

A special focus on leisure travel is justified due to its increasing dominance in travel demand. More importantly, leisure travel needs to be disaggregated into specific leisure activities as these all show different travel patterns: Schlich and colleagues (2004) found mean distances for leisure activities
ranging from 5.5 km (club meeting) to 28.5 km (private excursion to cultural events or places). Despite this exception, the existing body of research does not exhaust the complexity of leisure travel.

Hence, we were interested in the interplay of individual leisure activities, motives and travel patterns. Our major research questions were as follows:

- What leisure activities are undertaken by different social groups?
- What are the motives behind these leisure activities?
- To what extent can leisure travel be characterised by variety seeking?
- Which travel distances are covered by social interactions in leisure time?

2. Data collection

As discussed above, leisure activities and leisure time travel are highly diverse, with both day-to-day variations and systematic variations being evident. Thus, it is necessary to differentiate between intrapersonal and interpersonal variability. This implies surveys ought to be considerably longer than the one– or two–day diaries that are otherwise usual in travel behaviour analysis. Based on an earlier six–week diary (Axhausen et al., 2002; Schlich et al., 2004), Schlich and Axhausen (2003) suggest a minimum duration of two-weeks. Hence, we address our questions using two longitudinal diary data sets carried out in Switzerland (Table 2), which
are briefly presented below. The analysis is descriptive due to the explorative character of the surveys and the study.

----- about here Table 2 ------

2.1 Two-week diary in the city of Basel

Within a larger transdisciplinary research project on sustainable urban development and leisure time mobility (Scholz et al., 2004), we conducted a survey on leisure time travel. The reporting period of each respondent was two-weeks. We used a diary survey for all leisure activities. We asked respondents first about their time use during the day in one hour increments and then, for each leisure activity, about start and end times, a short description of the activity, mode of travel, destination, and activity company, and reasons for taking part in the activity. The instrument was based on the twelve-week diary described below (see Schlich et al., 2004, Figure 1). The activities were collected using an open question so as to allow flexibility. The answers were coded based on an existing but slightly adapted categorisation of 20 distinct categories (Schlich et al., 2004). Respondents reported motives using a closed question format (multiple response) with six categories (social contact, recreation, motion, nature
experience, learning, others) to ensure efficiency of data collection. The
categories of motives were based on earlier studies in the field (Dieteker and
Regli, 1998; Fastenmeier, 2003; Fuhrer and Kaiser, 1994; Tokarski and
Schmitz-Scherzer, 1985).

The study area was the city of Basel, an urban area of around 180,000
inhabitants at the border between Switzerland, France and Germany. We
used contrast sampling to get a broad picture of leisure time activities. We
selected four distinct groups based on age and living situation: young people
between the age of 16 and 24; families with young children (aged below 16
years); single households and partner households with no children; and
households with all members above the age of 50. For each group, we
targeted a sample size of 20 persons; thanks to the overall project (Scholz et
al., 2004), we were able to recruit respondents largely through our existing
contacts. Three distinctive strategies to recruit respondents were combined:
(i) visiting existing contacts to motivate for participation; (ii) asking the
contacts to nominate other persons we could contact (snowball principle);
(iii) visiting facilities where eligible persons are expected to meet (youth
centres, children's playground, etc.). In total 89 diaries were distributed to
those willing to participate and 74 completed (66 full time, 8 only one
week). Given the high response burden of the diary approach, a completion rate of 83% is good and quite similar to the twelve-week study (see below). Yet some self-selection process cannot be ruled out (see discussion). The respondents reported a total of 1595 activities and 2071 motives (more than one motive per activity was possible).

2.2 Twelve-week diary in the agglomeration of Zürich

The second dataset was collected within a project on the determinants of leisure traffic (Schlich et al., 2004). Due to the highly diverse character of leisure activities an unprecedented reporting period of 12 weeks for each respondent was chosen. We asked if the activity was performed alone, with the household dog, in the company of household members or other persons (with multiple answers possible) as the presence of company might be more important for the performance of some leisure activities than any other characteristic of the activity. The importance of social contact will be systematically underestimated if only meetings are regarded as social activities. Activities which are performed together generate traffic not only for the respondent, but also for the person with whom the activity was performed. For this reason we asked after the end of the main survey all respondents to report the place of residence of non-household members with whom an activity was performed.
The study area was the agglomeration of Zürich, an area of around 1 Million inhabitants in the eastern part of Switzerland. Of the approximately 800 persons contacted, only 91 agreed to participate. Upon explaining the requirements of the survey, another 17 persons decided not participate. During the survey, one respondent died and two quit, so that a total 71 persons from the city of Zürich (29) and from two communities in the agglomeration (Opfikon with 20 and Männedorf with 23) took part; a completion rate of 80%.

Obviously the recruiting of respondents was difficult. Despite an incentive of CHF 150 per person only 11 percent of all people contacted were willing to participate. Still, there is no hint that the participating persons differ from the population of their home towns. On the contrary, a quota concerning household size assured that different prevailing circumstances were present. A comparison with the national survey on travel behaviour showed no major biases in this survey (see Schlich et al., 2003). In a Poisson regression of the number of reported trips over the reporting period no fatigue effect could be detected (see Schlich et al., 2004).

Altogether the respondents reported 5705 leisure activities on 5936 days, which is about one per day and consistent with other surveys on travel behaviour.
3. Insights into the questions

While the two surveys overlap in their content, they are not identical: the two-week-diary covered a fully urbanized area; the twelve-week diary as well suburban areas. Hence, strict comparisons are not possible. However, they both offer insights into our original questions, why we present them side-by-side.

3.1 Which activities are undertaken?

Going to a restaurant, a bar or a disco was the most frequently reported leisure activity for the two-week diary sample in Basel, followed by going for walk and visiting the cinema, theatre or museum (Table 3). This was also found to be true in the twelve-week diary, but with sports activities (both active and passive) replacing the cultural activities reported in Basel. Yet the reported shares for different activities differ in their magnitude and the activities in the agglomeration of Zürich cluster more than in the city of Basel (first four activities sum up to 64% in the first and to 49% in the latter).

In the two-week diary for the youngest group, meeting friends was even more common than going to a restaurant, while for families with children, going for a walk was the preferred leisure activity. In single and partner households without children, going to a restaurant, bar and disco was most preferred, while for older people, visiting the cinema, theatre, and museum
was comprised the leisure activities of choice. Some differences were also visible in the twelve-week diary; Table 3 reports a breakdown by sex, which is biggest for going to restaurants/pubs.

----- about here Table 3 ------

The enormous differences in the modal shares apparent within each survey has been obscured in most earlier studies as these tend not to break down leisure into its very different components (Table 4). Note that the twelve-week sample included suburban residents, which explains the general higher shares of motorised transport, except for child care where the two-week-diary in the city of Basel reports a largely higher car use. Yet still in suburban areas, for most of the activities car use has been reported in less than half of the cases. Larger shares of care use can be observed for social interaction and shopping.

----- about here Table 4------
3.2 What motivates the activities?

Overall, social contact is the dominant motive for leisure activities (Table 5) with 43% of respondents providing this as a motive in the two-week diary. As can be expected, this figure is even greater for the following activities: meeting family and relatives; meeting friends; accompanying relatives and friends; child care. Yet, the social contact motive was even important as a core motive for political activity and volunteer work (58%); as well as for visits to the cinema, theatre, and museum (40%).

----- about here Table 5 ------

This dominance can also be seen when analysing the share of activities during which a person is accompanied by other(s), as was asked in the twelve-week diary (Figure 2). On average a person travelled along with somebody else for 72% of activities, a figure which underestimates social contacts as in many cases other parties will be met at the destination. The inclusion of the presence of a dog might strike the reader as fanciful, but in many households the needs of the animal shape the daily schedule and the prominence of the category "going for a walk" is due to dog owners. The numbers in the two-week diary were similar.
3.3 To what extent can leisure travel be characterised by variety seeking?

With leisure, more than with any other activity, a pertinent issue concerns whether it is undertaken for its own sake at new locations or in new forms. How important is variety seeking? Figure 3 shows the share of locations for leisure activities which have not yet been observed during the reporting period. A leisure location is defined as a unique combination of postal code and activity. With this very rough spatial resolution the number of newly observed locations will be underestimated. The share of unique newly observed leisure locations drops quickly from nearly one on the first day and stabilizes at around one third by the end of the observation period. Respondents have clearly not exhausted their set of known locations after this period. This is confirmed by the analysis GPS–based tracing of cars of even longer duration, as reported in Schönfelder et al. (2005) and Schönfelder and Axhausen (2004).

Two-thirds of the locations are only visited once and one-seventh only twice. This reinforces the impression that respondents seek new things to
see and do. For each activity, we asked respondents if it was performed for the first time ever (because new locations from the point of view of the observer need not be new to respondents). The share of new locations defined in this manner is also indicated in Figure 3 as the light grey bars.

Two interesting results can be seen: First, there is no trend visible during the twelve-week period of study, oscillating around a mean of 7%. Second, there are no marked differences between different weekdays: Monday with 5% versus Saturday with 10%; Friday lags a bit with 9%. Such new locations are chosen disproportionately more often not only when going out to a restaurant or for cultural events, but also when meeting friends. Females search out new places when shopping for non-daily demands. Still, it is males in general and middle-aged males in particular who are open to new locations (Table 6).

--- about here Table 6 ---

Summing up, respondents reported 2.6 visits per location of which two thirds were visited only once, indicating a willingness to experiment. Still, some leisure is quite regular: consider the person walking his/her dog around the block. Importantly, new locations are constantly added during the reporting period. Such variety seeking raises the interesting question of the extent to which persons with above average tendencies of variety
seeking choose environments that permit this desire to be satisfied more easily.

3.4 Which travel distances are covered by social interactions in leisure time?

As mentioned above, respondents were asked to indicate the home location of all non-household members they met for leisure activities during the twelve-week survey. It was thus possible to calculate distance (as the crow flies) at the postal code level for 1194 respondent and contact pairs, and for 997 (913) distances between meeting points and the home location of the respondent (of the contact).

----- about here Figure 4 -----
importance in terms of distances of the rarer meetings with contacts from further away.

Extending this analysis by examining how long the distances to the joint meeting point covered by respondent and contact (see Figure 5) reveals a striking imbalance. This imbalance is due to the prominence of meeting points and contacts living inside the city of Zürich, which forces those living in suburban locations to travel when meeting their contacts. For the respondents living in Zürich their distances are equal to those of their contacts. There are pronounced differences by activity. Going out for dinner or a drink requires less travel than going to a museum or meeting somebody. Meeting others for joint sports activities or a joint walk encourages even longer distances.

----- about here Figure 5 ------

4. Discussion

Results from the two-week diary in Basel need to be interpreted with some caution; we used a contrast sample and, as such, have no representative sample. Furthermore, there is some potential that environmentally friendly persons were over represented (self selection), as the project as a whole examined the sustainable development of the city of Basel (Scholz et al.,
The recruitment of young people was problematic, yielding the greatest share of non-respondents and dropouts. This is certainly due to the nature of our study: diary studies place a considerable burden on respondents and, therefore, much effort has to be placed on motivating people to participate. The primary aim was explorative: to test whether the collection and recording of motives in leisure travel study is fruitful. A further problem is that of seasonality: the survey took place in winter, during which leisure activities, in particular, differ from those in summer (see e.g. Kemperman et al., 2002).

The twelve-week diary had greater resources at its disposal and differences between its results and normal random samples have not been found. Still, as a quota sample, it cannot cover the entire range of personal, locational and transport conditions, which one is likely to find in a larger one-day survey.

Some of the variance in results between the two surveys can be traced back to the difference in study area: the two-week diary was conducted in the city of Basel, the twelve-week diary in the agglomeration of Zürich. The latter covered respondents from suburban communities, likely to travel more by car and having to travel longer distances to attend e.g. cultural events.

Despite the methodological limitations of our surveys, we were nevertheless able to shed more light on the complex phenomenon of leisure travel. Leisure activities are extremely varied and it is therefore important to
differentiate among different categories to be able to see regularities. Even so, there are some patterns that remain visible at the aggregate level. As in other studies, we found that social contact is crucial to leisure (Fastenmeier et al., 2001; Lanzendorf, 2000; Schlich et al., 2004; Veldhuisen et al., 2000; Zängler and Karg, 2000). In contrast to other studies, in which motives were inferred from the activity, we enquired in the two-week diary directly as to the motives of individuals, something we would like to stress as crucial. This can be illustrated by the fact that social motives are predominant in leisure travel, even for activities that would not suggest this at first glance: e.g. visit of theatre, museum, restaurant, political activity, volunteer work, shopping for long term needs. This goes in hand with a central tenet of the functional approach to motivation: Clary et al. (1998, p. 1517) argue "that people can and do perform the same actions in the service of different psychological functions" and activities "that appear to be quite similar on the surface may reflect markedly different underlying motivational processes".

The six motive categories (social contact, recreation, motion, nature experience, learning, others) were varied and broad enough to allow respondents to identify their motives in a consistent and not too burdensome manner. Still, for a quarter of the activities, respondents selected the "other" category. This ranged from 1% for sports to 41% for window shopping, 43% for club meetings, 54% for child care, and up to 66% for daily
shopping and 67% for visiting a medical doctor\textsuperscript{1}. The activities with a high share of non specified motives cover mainly personal obligations, which for many respondents are not proper leisure time activities. The marked exception here is window shopping, which many respondents could not link with any specific predefined categories. Additional response categories, such as "distraction" or "search/information gathering", might be suitable candidates to reduce the share of "other" responses. This should be the subject of future research. On the other hand, reported motives may reflect a form of forced rationalization process, as many of the activities can be habitual (Gärling et al., 1998; Gärling et al., 2002; Gärling and Axhausen, 2003). Explicitly asking for "no clear motive" could be added to account for this effect.

Travel modes vary greatly between different leisure activities supporting the result of Schlich et al. (2004, p. 227): "the use of travel modes turns out to more variable for distinct leisure activities than for the generic category leisure-which again strengthens the necessity of looking at leisure activities in more detail". It is worth mentioning, that car use is not predominant for many leisure activities and that walking and biking are the preferred mode in more than 50% of cases – a fact well known in Switzerland. These very

\textsuperscript{1} Differences in the percentages compared with Table 5 are due to the fact that we excluded all multiple responses and only report those activities for which "other" was the only motive.
high numbers are consistent with the residential areas of the survey respondents: fully urbanised (Basel) in the case of two-week diary; urban and suburban for the twelve-week diary. Still, these patterns – though on a lower level – can also be seen in a third survey undertaken in a rural and small town environment in Switzerland, where more than 30% of leisure activities were reached by foot or cycling (see Axhausen et al., 2004 for a description of the survey). For the role of densely used and varied environments as preferred places for walking and cycling, see Karlaftis and Golias (2002) or Kaufmann et al. (2005). On the other hand, shopping and social interaction is dominated by car use and in the city of Basel additionally child care. This corroborates the study of Dieleman and colleagues (2002, p. 525), who discuss two major functions of private car use: "Shopping trolley. People use their cars as a convenient shopping trolley" and "Taxi. Parents have important reasons for driving children to school or sports events by private car". The latter has been studied recently in a specific research project (Black et al., 2001), while the former has been addressed in retail planning in the city centre or around nodes of public transport (Lowe, 2005; Schwanen et al., 2004).

The twelve-week survey provides interesting evidence on the role of social networks in leisure travel. It shows how widely distributed one’s contacts are and the resulting travel needs. This is in line with the hypotheses of Wellman (1996 and 1999); Gebhardt and Schweizer (1995);
or Axhausen (2005) that the distances to friends and relatives have grown in the last years and that today’s social networks cover a larger area. Taking into account that the distribution of contacts is very disperse, it is no surprise that the car is very prominent in leisure travel.

5. Conclusions

We have seen that it is important to examine motives and not only activity. Hence, explanatory models of travel demand need to be expanded to cover motives (Stern and Richardson, 2005), attitudes, intentions (Gärling et al., 1998; Holden, 2005; Kitamura et al., 1997) and probably other personality traits (Mokhtarian and Chen, 2004). Patterns in personality factors, socio-demographics, motives or habitual behaviour and living situation (e.g. urban setting) can be integrated with the concept of lifestyle, as a useful short hand description (e.g. Choo and Mokhtarian, 2004; Götz et al., 2003; Lanzendorf, 2002; Stauffacher et al., 2004). A more comprehensive and integrated picture of the existing variability and patterns in individual travel behaviour and character is needed to account more fully for the complexity of activity and travel planning.

It is difficult to influence leisure activities and corresponding travel: Would it be legitimate to hinder social gatherings or to steer existing societal trends towards less spatially dispersed social networks? Hence, attention needs to focus on activities that can be – or could be, given
adequate planning – undertaken at the local level. Crucial factors seem to be short distances and well-established infrastructure for pedestrians and cyclists; public transport for longer trips; and dense mixed-use development around public transport stations (Beckmann, 2002; Bertolini, 1999; Stauffacher et al., 2005). This is mirrored by the new Dutch policy for urban networks (Maat et al., 2005, p. 35-6): "concentrating new work and housing developments near to existing and potential public transport nodes" and building a polycentric urban region (e.g. Meijers, 2005). On neighbourhood scale this has for long time been called new urbanism (Maat et al., 2005, p. 37): "creation of diverse, compact, and mixed neighbourhoods. Everyday activities, such as housing, work, schools, shops, and other amenities, are all ideally within 10 minutes' walking distance of each other" (see as well Calthorpe, 1993; Congress for New Urbanism, 2000; Duany and Plater-Zyberk, 1991). This goes in hand with the urban regeneration through retail development observed in recent years in the UK (Lowe, 2005). The urban and city network area needs to offer enough opportunities for alternative travel modes. As already stressed above, these efforts will only affect those trips that can be undertaken at the local level. Greater changes in travel demand can only be expected if people reconstruct their social networks, e.g. living closer to friends and relatives (Axhausen, 2005). It goes without saying that in this respect, spatial planning will have no role to play.
Households with no cars are quite common in Swiss cities (e.g. Müller et al., 1999). Car-free households are crucial when it comes to the management of travel demand: "if people own a car, they use it" (Dieleman et al., 2002, p. 524). At least less car possession (i.e. no more than one) seems feasible as it depends on "traffic network, efficiency, and transit level-of-service parameters" in contrast to 'autolessness' that depends - in the main - only on socio-economic factors (Karlaftis and Golias, 2002, p. 29). Car-free or car-reduced life styles are important and need special attention (Bhat and Pulugurta, 1998; Handy, 2005; Reutter and Reutter, 1996; Stradling et al., 2000; Wright and Egan, 2000). Interventions are necessary to address life styles and to make urban life more attractive (Lawson, 2001; Stead and Hoppenbrouwer, 2004). With such approaches we can integrate the context and the personal level, as one’s residence is shaped by individual life styles and is dependent on housing choices. The real challenge for the sustainable development of leisure travel, therefore, lies in the marketing of more sustainable life styles – living in urban areas, possibly without a car – and making such housing and neighbourhoods available: "new urbanism strategies make it easier for those who want to drive less to do so" (Handy, 2005, p. 163).
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The authors acknowledge the support of Daniel Lang for the organisation and supervision of data collection in Basel. Data collection, data input and basic statistical analyses were carried out by the students of the transdisciplinary case study 2003/04 "Leisure mobility in Basel". Special thanks go to Franziska Ritter, who compiled a first study report and to Dieter Kaufmann, Peter de Haan, Stefan Zemp, Sandro Bösch, and Peter Loukopoulos.
References


### Appendix

*Question and answers in the leisure activity form (Figure 1)*

- At what time started your activity? (open question)
- At what time finished your activity? (open question)
- What leisure activity did you undertake? (open question)
- What transport mode did you mainly use? (answer categories for arrival and departure: by foot, bike, car as driver, car as passenger, motorbike, bus/tramway, railway, others)
- At what place have you been (with going for a walk several places possible)? (open question)
- Who has accompanied you on the way to the activity (multiple responses possible)? (answer categories: adult household member, child household member, other, dog, nobody)
- Who has accompanied you during the activity (multiple responses possible)? (answer categories: adult household member, child household member, other, dog, nobody)
• What was the motive for your activity (provide only main reason)?

(answer categories: social contact, recreation, motion, nature experience, learning, others)
Tables
### Table 1 Trip making and kilometres travelled by purpose

<table>
<thead>
<tr>
<th></th>
<th>Leisure</th>
<th>Work/School</th>
<th>Shopping/private business</th>
<th>Escort</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>39.5%</td>
<td>35.5%</td>
<td>19.1%</td>
<td>4.8%</td>
<td>1.0%</td>
<td>100%</td>
</tr>
<tr>
<td>Germany</td>
<td>35.0%</td>
<td>18.2%</td>
<td>34.8%</td>
<td>6.4%</td>
<td>5.6%</td>
<td>100%</td>
</tr>
<tr>
<td>UK</td>
<td>26.5%</td>
<td>25.3%</td>
<td>31.3%</td>
<td>12.6%</td>
<td>4.3%</td>
<td>100%</td>
</tr>
<tr>
<td>USA</td>
<td>26.7%</td>
<td>25.2%</td>
<td>37.6%</td>
<td>10.2%</td>
<td>0.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Leisure</th>
<th>Work/School</th>
<th>Shopping/private business</th>
<th>Escort</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>Switzerland</td>
<td>44.8%</td>
<td>35.0%</td>
<td>11.2%</td>
<td>4.9%</td>
<td>4.8%</td>
<td>100%</td>
</tr>
<tr>
<td>Germany</td>
<td>38.3%</td>
<td>29.7%</td>
<td>21.7%</td>
<td>4.5%</td>
<td>4.8%</td>
<td>100%</td>
</tr>
<tr>
<td>UK</td>
<td>33.7%</td>
<td>32.0%</td>
<td>19.7%</td>
<td>7.6%</td>
<td>7.1%</td>
<td>100%</td>
</tr>
<tr>
<td>USA</td>
<td>32.2%</td>
<td>31.3%</td>
<td>27.6%</td>
<td>8.5%</td>
<td>0.5%</td>
<td>100%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Study area</th>
<th>Two-week diary</th>
<th>Twelve-week diary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting period</td>
<td>2 weeks</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Sample</td>
<td>74 (8 for one week only)</td>
<td>71</td>
</tr>
<tr>
<td>Completion rate</td>
<td>83%</td>
<td>80%</td>
</tr>
<tr>
<td>Number of activities reported</td>
<td>1595</td>
<td>5705</td>
</tr>
<tr>
<td>Mean age</td>
<td>45 (range from 16 to 78)</td>
<td>45 (range from 16 to 84)</td>
</tr>
<tr>
<td>Sex</td>
<td>55% males, 45% females</td>
<td>52% male and 48% female</td>
</tr>
<tr>
<td>Share of car and motorcycle driving licence holders</td>
<td>65%</td>
<td>63%</td>
</tr>
<tr>
<td>Timing</td>
<td>November 2003</td>
<td>January to June 2002</td>
</tr>
<tr>
<td>Responsible</td>
<td>HES, ETH Zürich</td>
<td>IVT, ETH Zürich</td>
</tr>
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</table>

Table 2 Comparison of the two activity diaries used
Table 3 Shares of leisure activities in the two surveys

<table>
<thead>
<tr>
<th>Rank (2-week diary, BS)</th>
<th>Rank (12-week diary, ZH)</th>
<th>leisure activity (excluding professional activities)</th>
<th>Share of activities</th>
<th>By sex (12-week diary, ZH)</th>
<th>By person group (2-week diary, BS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Two-week diary (BS)</td>
<td>Twelve-week diary (ZH)</td>
<td>Female</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>restaurant, bar, disco</td>
<td>11.8%</td>
<td>18.6%</td>
<td>15.1%</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>going for a walk</td>
<td>10.9%</td>
<td>18.3%</td>
<td>17.3%</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>cinema, theatre, museum, etc.</td>
<td>9.8%</td>
<td>5.9%</td>
<td>5.8%</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>daily shopping</td>
<td>9.5%</td>
<td>3.0%</td>
<td>4.1%</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>sports</td>
<td>8.8%</td>
<td>14.0%</td>
<td>13.5%</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>meeting friends</td>
<td>8.5%</td>
<td>11.2%</td>
<td>11.1%</td>
</tr>
<tr>
<td>7</td>
<td>9</td>
<td>window shopping</td>
<td>5.5%</td>
<td>2.9%</td>
<td>3.7%</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
<td>political activity, volunteer work</td>
<td>4.6%</td>
<td>2.3%</td>
<td>1.8%</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>meeting family and relatives</td>
<td>3.8%</td>
<td>3.5%</td>
<td>3.5%</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>child care</td>
<td>3.0%</td>
<td>1.4%</td>
<td>2.6%</td>
</tr>
<tr>
<td>11</td>
<td>7</td>
<td>club meeting</td>
<td>2.6%</td>
<td>3.5%</td>
<td>4.8%</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>medical doctor, hospital, etc.</td>
<td>2.3%</td>
<td>1.2%</td>
<td>1.7%</td>
</tr>
<tr>
<td>13</td>
<td>13</td>
<td>training/education</td>
<td>2.1%</td>
<td>1.1%</td>
<td>1.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>all others and unspecified</td>
<td>16.9%</td>
<td>12.9%</td>
<td>13.6%</td>
</tr>
<tr>
<td>total</td>
<td></td>
<td>total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Number of activities  1595  5638  2839  2799  317  437  363  478

Notes BS: city of Basel; ZH: agglomeration of Zurich
<table>
<thead>
<tr>
<th>Activity</th>
<th>Two-week diary (BS)</th>
<th></th>
<th>Twelve-week diary (ZH)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Car</td>
<td>Public transport</td>
<td>Motorised</td>
<td>Foot, bike</td>
</tr>
<tr>
<td>Shopping: long term</td>
<td>57.1%</td>
<td>23.8%</td>
<td>80.9%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Medical doctor, hospital, etc.</td>
<td>36.1%</td>
<td>33.3%</td>
<td>69.4%</td>
<td>30.6%</td>
</tr>
<tr>
<td>Meeting family and relatives</td>
<td>37.9%</td>
<td>27.6%</td>
<td>65.5%</td>
<td>34.5%</td>
</tr>
<tr>
<td>Child care</td>
<td>57.4%</td>
<td>6.4%</td>
<td>63.8%</td>
<td>36.2%</td>
</tr>
<tr>
<td>Accompanying family members, friends</td>
<td>43.5%</td>
<td>13.0%</td>
<td>56.5%</td>
<td>43.5%</td>
</tr>
<tr>
<td>Political activity, volunteer work</td>
<td>35.1%</td>
<td>17.6%</td>
<td>52.7%</td>
<td>47.3%</td>
</tr>
<tr>
<td>Cinema, theatre, museum, concert, etc.</td>
<td>25.8%</td>
<td>23.9%</td>
<td>49.7%</td>
<td>50.3%</td>
</tr>
<tr>
<td>Meeting friends</td>
<td>25.4%</td>
<td>21.6%</td>
<td>47.0%</td>
<td>53.0%</td>
</tr>
<tr>
<td>Window shopping</td>
<td>13.8%</td>
<td>32.2%</td>
<td>46.0%</td>
<td>54.0%</td>
</tr>
<tr>
<td>Training/education</td>
<td>21.2%</td>
<td>24.2%</td>
<td>45.4%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Club meeting</td>
<td>19.0%</td>
<td>26.2%</td>
<td>45.2%</td>
<td>54.8%</td>
</tr>
<tr>
<td>Daily shopping</td>
<td>24.5%</td>
<td>9.9%</td>
<td>34.4%</td>
<td>65.6%</td>
</tr>
<tr>
<td>Sports</td>
<td>20.0%</td>
<td>14.3%</td>
<td>34.3%</td>
<td>63.6%</td>
</tr>
<tr>
<td>Restaurant, bar, disco</td>
<td>14.4%</td>
<td>16.5%</td>
<td>30.9%</td>
<td>68.6%</td>
</tr>
<tr>
<td>Going for a walk</td>
<td>7.6%</td>
<td>5.2%</td>
<td>12.8%</td>
<td>87.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>24.8%</td>
<td>18.8%</td>
<td>43.6%</td>
<td>56.1%</td>
</tr>
</tbody>
</table>

Notes BS: city of Basel; ZH: agglomeration of Zurich
<table>
<thead>
<tr>
<th>Activity</th>
<th>Social contact</th>
<th>Recreation</th>
<th>Motion</th>
<th>Nature experience</th>
<th>Learning</th>
<th>Others, not specified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting family and relatives</td>
<td>96.7%</td>
<td>3.3%</td>
<td>1.7%</td>
<td>1.7%</td>
<td>0.0%</td>
<td>11.7%</td>
<td>115%</td>
</tr>
<tr>
<td>Meeting friends</td>
<td>94.1%</td>
<td>17.0%</td>
<td>3.0%</td>
<td>4.4%</td>
<td>1.5%</td>
<td>13.3%</td>
<td>133%</td>
</tr>
<tr>
<td>Accompanying family members, friends</td>
<td>87.0%</td>
<td>4.3%</td>
<td>8.7%</td>
<td>0.0%</td>
<td>30.4%</td>
<td>30.4%</td>
<td>161%</td>
</tr>
<tr>
<td>Restaurant, bar, disco</td>
<td>71.3%</td>
<td>26.6%</td>
<td>2.1%</td>
<td>0.0%</td>
<td>1.1%</td>
<td>18.6%</td>
<td>120%</td>
</tr>
<tr>
<td>Child care</td>
<td>59.6%</td>
<td>12.8%</td>
<td>8.5%</td>
<td>4.3%</td>
<td>4.3%</td>
<td>61.7%</td>
<td>151%</td>
</tr>
<tr>
<td>Political activity, volunteer work</td>
<td>58.1%</td>
<td>8.1%</td>
<td>5.4%</td>
<td>6.8%</td>
<td>16.2%</td>
<td>32.4%</td>
<td>127%</td>
</tr>
<tr>
<td>Cinema, theatre, museum, concert, etc.</td>
<td>40.0%</td>
<td>15.5%</td>
<td>3.2%</td>
<td>2.6%</td>
<td>18.1%</td>
<td>36.8%</td>
<td>116%</td>
</tr>
<tr>
<td>Shopping: long term</td>
<td>38.1%</td>
<td>9.5%</td>
<td>9.5%</td>
<td>33.3%</td>
<td>0.0%</td>
<td>76.2%</td>
<td>167%</td>
</tr>
<tr>
<td>Club meeting</td>
<td>35.7%</td>
<td>0.0%</td>
<td>2.4%</td>
<td>4.8%</td>
<td>23.8%</td>
<td>52.4%</td>
<td>119%</td>
</tr>
<tr>
<td>Going for a walk</td>
<td>27.2%</td>
<td>34.7%</td>
<td>56.1%</td>
<td>9.2%</td>
<td>0.6%</td>
<td>15.6%</td>
<td>143%</td>
</tr>
<tr>
<td>Window shopping</td>
<td>23.3%</td>
<td>25.6%</td>
<td>12.8%</td>
<td>11.6%</td>
<td>1.2%</td>
<td>57.0%</td>
<td>132%</td>
</tr>
<tr>
<td>Daily shopping</td>
<td>11.6%</td>
<td>5.4%</td>
<td>10.2%</td>
<td>11.6%</td>
<td>2.0%</td>
<td>81.0%</td>
<td>122%</td>
</tr>
<tr>
<td>Sports</td>
<td>11.4%</td>
<td>23.6%</td>
<td>80.0%</td>
<td>16.4%</td>
<td>3.6%</td>
<td>3.6%</td>
<td>139%</td>
</tr>
<tr>
<td>Medical doctor, hospital, etc.</td>
<td>11.1%</td>
<td>5.6%</td>
<td>8.3%</td>
<td>11.1%</td>
<td>0.0%</td>
<td>83.3%</td>
<td>119%</td>
</tr>
<tr>
<td>Training/education</td>
<td>9.4%</td>
<td>15.6%</td>
<td>3.1%</td>
<td>0.0%</td>
<td>87.5%</td>
<td>12.5%</td>
<td>128%</td>
</tr>
<tr>
<td>Total</td>
<td>43.4%</td>
<td>19.4%</td>
<td>18.6%</td>
<td>7.6%</td>
<td>8.1%</td>
<td>33.8%</td>
<td>131%</td>
</tr>
</tbody>
</table>

Notes: BS: city of Basel. More than one motive per activity was possible.
Table 6 Share of locations never visited before by age and sex in the twelve-week diary (ZH)

<table>
<thead>
<tr>
<th>Age</th>
<th>16 - 29 Years</th>
<th>Mean</th>
<th>s.e. of the mean</th>
<th>30 to 49 years</th>
<th>Mean</th>
<th>s.e. of the mean</th>
<th>50 and above</th>
<th>Mean</th>
<th>s.e. of the mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>.11</td>
<td>.01</td>
<td>.06</td>
<td>.01</td>
<td>.04</td>
<td>.01</td>
<td>.06</td>
<td>.00</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>.11</td>
<td>.01</td>
<td>.12</td>
<td>.01</td>
<td>.04</td>
<td>.01</td>
<td>.08</td>
<td>.01</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td>.11</td>
<td>.01</td>
<td>.08</td>
<td>.01</td>
<td>.04</td>
<td>.00</td>
<td>.07</td>
<td>.00</td>
</tr>
</tbody>
</table>

Notes: Location is defined as a unique combination of activity and zip code for each person. Statistical tests (uni-variate ANOVA) show significant overall effects for sex (df = 1, F = 8.989, p = 0.003), age (df = 2, F = 34.421, p < 0.001) and the interaction effect sex*age (df = 2, F = 7.940, p < 0.0001).
Bitte machen Sie folgende Angaben zu allen Freizeitaktivitäten ausser Haus:

<table>
<thead>
<tr>
<th>Erste Aktivität</th>
<th>Zweite Aktivität</th>
<th>Dritte Aktivität</th>
</tr>
</thead>
<tbody>
<tr>
<td>Um wieviel Uhr hat Ihre Aktivität begonnen?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Um wieviel Uhr haben Sie die Aktivität beendet?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welche Freizeitaktivität haben Sie durchgeführt?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welches Verkehrsmittel haben Sie hauptsächlich benutzt?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anreise</td>
<td>Abreise</td>
<td>Anreise</td>
</tr>
<tr>
<td>Zu Fuss</td>
<td>Fahrrad / Velo</td>
<td>PKW als Fahrer</td>
</tr>
<tr>
<td>PKW als Mitfahrer</td>
<td>Motorrad</td>
<td>Bus / Tram</td>
</tr>
<tr>
<td>Eisenbahn</td>
<td>Andere</td>
<td></td>
</tr>
<tr>
<td>Anreise</td>
<td>Abreise</td>
<td>Abreise</td>
</tr>
<tr>
<td>Zu Fuss</td>
<td>Fahrrad / Velo</td>
<td>PKW als Fahrer</td>
</tr>
<tr>
<td>PKW als Mitfahrer</td>
<td>Motorrad</td>
<td>Bus / Tram</td>
</tr>
<tr>
<td>Eisenbahn</td>
<td>Andere</td>
<td></td>
</tr>
</tbody>
</table>

An welchem Ort sind Sie gewesen? (bei Spaziergängen, etc. Mehrfachangaben möglich)

Wer hat Sie begleitet auf dem Weg zur Aktivität? (Mehrfachantwort möglich)

- Mitbewohner Erw.
- Mitbewohner Kind
- Andere
- Hund
- Niemand

Wer hat Sie begleitet bei der Aktivität? (Mehrfachantwort möglich)

- Mitbewohner
- Andere
- Hund
- Niemand

Was war die Motivation für Ihre Aktivität? (Nur Hauptgrund angeben)

- Sozialer Kontakt
- Erholung
- Bewegung
- Naturerlebnis
- Neues Lernen
- Andere

- Sozialer Kontakt
- Erholung
- Bewegung
- Naturerlebnis
- Neues Lernen
- Andere

- Sozialer Kontakt
- Erholung
- Bewegung
- Naturerlebnis
- Neues Lernen
- Andere
Figure 2 Share of activities [%] accompanied by others by type (twelve-week diary, ZH)
Figure 3 Share of locations by previous visit [%] (twelve-week diary, ZH)

Location is defined as a unique combination of activity and zip code for each person
Figure 4 Crow-fly distance between the home locations of the respondents and their meeting contacts [km] (weighted by the frequency of meetings, twelve-week diary, ZH)

To exclude outliers distances of over 250 km were capped and set to 250 km.
Figure 5 Crow-fly distance between home locations and meeting points for respondents and their contacts for selected activities [km] (twelve-week diary, ZH)