# TRAVELING LONG-DISTANCE WITH BAD CONSCIENCE? – DISCREPANCIES BETWEEN EVERYDAY AND LONG-DISTANCE TRAVEL OF URBANITES

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**ABSTRACT**

The currently growing awareness about the climate change is in conflict with one's own behavior resulting from global trends such as the globalization and new lifestyles, that involve an increase of long-distance travel. Whereas people living in urban areas tend to travel short distances with environmentally friendly means of transport in everyday life, studies indicate a higher amount of long-distance travel of urbanites. The question arises whether behavior and norms in everyday life affects long-distance travel behavior. By using data from surveys in Hamburg and Berlin (Germany), we analyze the long-distance travel behavior of urban people in a comprehensive context including everyday travel, attitudes and norms, sociodemographic as well as spatial characteristics as a proxy for urbanity. Of particular relevance is, whether there are discrepancies or similarities between the behavior in everyday life and the long-distance travel behavior. The results indicate, that people who live in highly urban areas are most likely to travel more than 3,000 km, which involves primarily air travel. This effect is reduced only by the ecological norm of the individuals. People who pay attention to sustainable means of transport in their daily lives are less likely to be long-haul travelers. We see, however, that the effect of living in dense urban areas overcompensates the effect of the ecological norm. Shifting leisure activities to everyday life also reduces the probability of traveling to distant places. This indicates an offset between the everyday and the long-distance travel behavior of individuals.

**Keywords:** Long-distance travel, everyday travel, ecological norm, urbanites, Germany

## INTRODUCTION

Recently, the issue of climate impact and greenhouse gas emissions became highly relevant. Perpetrators of greenhouse gas emissions are various. Within the discussion of climate change, identifying them and measuring their specific effects on global change are essential tasks. Tourism and traveling, primarily air travel, is seen as a major climate threat. The environmental aspect of tourism and long-distance travel is important to take into account as people travel rather long distances and the means of transport that are used are likely to have high environmental impacts (*1*). Lenzen et al. (*2*) found tourism related emissions increased strongly from 3.9 GtCO2e to 4.5 GtCO2e in the past years 2009 to 2013. A major part of tourism related emissions is caused by transport, i.e., trips to and from the destination as well as on-site mobility. In contrast, a growing environmental awareness has recently been discussed, especially when traveling long distances by plane (e.g. air travel changes from a symbol of status to a symbol of shame (*3*)).

In the case of Germany, a large proportion (45%) of the total mileage results from long-distance travel (*4*). Emerging new lifestyles, global trends such as globalization and higher incomes lead to high dynamics of long-distance travel and tourism. Tourism is not affected by obligations or necessities but results from the person's choice to travel. Especially when measures and policies should be implemented, this difference between the types of travel has to be considered.

In contrast to everyday travel where the understanding of factors influencing behavior is comparatively high, the understanding of long-distance travel and tourism can still be regarded as low. One reason is the difficulty of collecting data, as long-distance travel has the characteristic of irregularity and is comparatively rare at an individual level. Furthermore, only a small part of the population (10%) is responsible for a large proportion of long-distance travel (43%) (*5*). In addition, transport statistics usually only count nationally, which does not allow to measure the impact of air travel beyond the borders of a country.

In the investigation of long-distance travel, the consideration of the built environment is crucial, since the spatial types are important influencing factors (*6; 7*). People living in urban areas show shorter trip distances in everyday travel, but also show the tendency to compensate this with more frequent and distant leisure trips. Since growing and denser cities are the outcome of global trends, the understanding of the travel behavior of urban residents becomes important.

The ecological norm and the use of eco-friendly modes in everyday life may be compensated by more frequent and distant day trips and vacations and the use of less eco-friendly modes. To detect such discrepancies an integrated consideration of touristic travel and everyday travel is necessary. To identify influencing factors, we have formulated the following research questions: Are there spatial characteristics in urban areas that have a special influence on touristic travel? Can attitudes and norms influence touristic travel behavior more than the than the level of urbanity? Do we see discrepancies or similarities between everyday behavior and touristic travel behavior?

Through an innovative survey approach, we have detailed information about the sociodemographic characteristics of the participants, as well as on their attitudes towards different means of transportation and ecological norms. In addition, the study includes information about everyday travel behavior and also about touristic travel. The participants all have their place of residence in the two cities of Berlin in Hamburg, which allows us to analyze spatial characteristics in these German cities that influence touristic travel behavior. Therefore, we classify the participants in three distinct groups, according to their last tourism activities. We apply the classification into travel groups of Böhler et al. (*8*) in this context. Further, we compare them to

each other regarding attitudes, urban form and sociodemographic characteristics. Finally, we analyze the extent of influences by these characteristics on the touristic travel behavior of the people.

The paper is structured as follows: First, we explore the literature on long-distance travel and tourism and characterize the influencing factors. Second, the data used and the methodology of our analyzes is described. Third, we present results of a multinomial logistic regression model and interpret the resulting factors that influence tourism related travel. To conclude, we discuss the results, compare the long-distance travel with the everyday travel, outline the limits of our approach and refer to further work.

## LITERATURE REVIEW

The literature in travel behavior research is rather focused on everyday travel. Most studies collect data on everyday travel or commuting behavior only. However, the knowledge about the structure of long-distance travel events and touristic travel is comparatively low and there is only little data available to analyze this issue. Another research gap exists in the lack of comparisons between everyday, long-distance and tourism related travel. With the growing attention paid to emissions caused by transport in recent years, a deeper understanding of all types of travel is needed. One difficulty concerns the distinction between long-distance travel and tourism. For the former, a threshold value is usually set, e.g. 100 km (*9*). If a trip exceeds this threshold, it is defined as long-distance travel, independent of the trip purpose. The definition of tourism is different. There is no direct delimitation based on a distance criterion. The United Nations World Tourism Organization (UNWTO) definition specifies activities that take place outside a person's usual environment as tourism (*10; 11*). Therefore, trips to the place of work or second home are not to be classified as tourism, regardless of the distances traveled. The distinction of the definitions of tourism related travel and long-distance travel is difficult, since both overlap and may capture the same events. There is also a number of studies that focus on holiday travel, which often describes trips for leisure purposes and overnight stays (*12*). Since the literature deals with varying definitions, we further consider studies and results from both long-distance and touristic travel, since overlaps exist and one involves the other. Based on these difficulties, we give a definition on our research objective in a subsequent chapter of our study.

The importance of the investigation of long-distance travel and tourism is illustrated by the example of Germany: More than 50% of the climate emissions in Germany are caused by passenger travel. Air travel accounts for about 45% of this, and travel by car for about 46% (*1; 6*). Frick and Grimm (*4*) show with their analysis of various data sources, that in Germany 45% of the travel volume of people is caused by long-distance travel. These includes all trips with a one-way distance of more than 100 km. Taking this into account, it is crucial to analyze and understand touristic travel in addition to everyday travel, as only few events cause a large amount of travel volume and thus also emissions. Furthermore, new trends such as globalization and the growing economy are drivers of the demand, which is why we have to focus on this issue more intensively now and in the future. Growing transnational networks and emerging new lifestyles are another driving forces on tourism and long-distance travel demand (*6; 8*). The example of the German population also shows the growing trend to visit further distant destinations. In 2010 there were 4.5 million long-haul trips to other continents (equivalent to 6.5% of all holiday trips with at least 4 overnight stays). In 2018, however, the number had risen to 5.7 million trips (8.1%) (*13*).

A comprehensive analysis of holiday travel and its influences from different dimensions was carried out by Böhler et al. (*8*). Four different travel groups regarding the participant's number of undertaken holiday trips and the kilometers traveled are characterized. The study shows further differences between the groups according to the sociodemographic characteristics of the assigned people, as well as on their attitudes and mode choice. Furthermore, only a small group of people is responsible for a very large proportion of emissions in the study. The results show, that influencing variables on long-distance and tourist travel come from different dimensions. First of all, sociodemographic characteristics are considered to be decisive. Of notable importance is income. The higher the income of a household, the more people undertake long-distance travel (*7; 5*). This is also confirmed by the calculation of Aamaas et al. (*1*): Higher income classes are responsible for considerably more emissions as are lower income classes. Other sociodemographic characteristics, that are influencing factors both on long-distance and holiday travel, are the level of education, sex and occupation (*6–8; 14; 15*).

Another important aspect is given by the spatial characteristics of the place of residence. People living in urban areas travel shorter distances in everyday life than people in rural or suburban areas. However, this is reversed for long-distance leisure travel. Studies indicate a higher activity of urban people in long-distance (*6; 7*). Czepkiewicz gives a detailed overview of literature on this issue (*16*). LaMondia et al. (*15*) found in their study that persons from dense urban areas undertake a higher number of international trips and therefore undertake more air travel. This was also found by Holden and Norland (*17*). One reason for this is seen in the comparatively better accessibility of urban spaces. Another reason of the higher number of touristic activities of people living in urban areas deals with the compensation of life in compact and dense cities (*16*). For example, people who do not have access to a private garden show a higher extent of leisure trips (*17*). Overall, the literature indicates that even a rough classification into urban, suburban and rural or a classification into cities based on population size is sufficient to explain differences between the behavior of individuals. Due to the data available, such as the information from national household travel surveys, no further differentiations can usually be made. It therefore remains unclear whether certain characteristics of urban structure increase or decrease the amount of long-distance and tourism related travel. Even when controlling for income, car accessibility and level of education, people living in urban areas show higher activity in long-distance travel (*6*). However, it should also be considered, that people with certain lifestyles and preferences who chose to live in urban areas also undertake more tourism and long-distance leisure trips (*18*). The greater distribution of social networks, which is emerging from global trends, is an additional driver for the demand for long-distance travel among people in urban areas (*16*).

In addition to sociodemographic and spatial characteristics, the psychological dimension also has an influence on people's long-distance travel behavior (*19*). The often used and established theory of planned behavior by Aijzen (*20*) describes the influences of norms, intention and perceived behavior control on travel behavior. There are several studies, that underline these interdependencies of the psychological dimension and travel behavior (*21; 22*). This raises the question of whether a change in values and a higher environmental perception will also change people's long-distance and touristic travel behavior. Attitudes and perceptions play an important role in individuals' decision-making processes and are therefore relevant for the behavior.

Becken (*23*) shows, that people feel more responsible for climate impacts in their everyday life and feel less responsible when travelling. However, tourists are aware that their travel behavior does not correspond to the socially desired behavior. A further hint of the discrepancy between the everyday behavior of people and their holiday travel behavior is given by LaMondia et al. (*15*):

People who commute to work by foot or by bicycle show the highest number of long-distance leisure trips. More holiday trips may therefore serve to offset short distances and the use of environmentally friendly means of transport in everyday life. Commuters by public transport, tend to use more diverse modes on long-distance for leisure trips, which includes also air travel. People, who have a car in their household, tend to primarily use this mode of transport also for long-distance leisure trips (*15*). Barr and Prillwitz (*12*) emphasize the different situations for mode choice for everyday travel, leisure and holiday travel.

Summarizing, a discrepancy between the everyday and the seldom long-distance travel behavior for urbanites is indicated. The existing literature analyses different aspects on long-distance travel as well as tourism and identifies various influencing characteristics. However, the studies focus primarily on one aspect only. Little attention has been paid to the effects of the combination of different influences, such as urban structure and ecological norms. In the following, we explain the approach and structure of our survey, which allows a comprehensive consideration of influencing factors on long-distance and tourism-related travel of people living in urban areas.

## DATA COLLECTION, SURVEY DESIGN AND DATA DESCRIPTION

In this section, we present the applied survey approach and discuss the relevant data respectively variables for our further analyses. The data used come from two surveys that were carried out at two different time points. As the survey design was identical, the following explanations apply to both.

### Data collection

The survey approach was applied in the form of interviews in two different studies with minor modifications. However, the comparability between the surveyed questions in the two studies is given. One survey took place in Hamburg and Berlin from May to November 2016. There were 563 participants from the districts “Ottensen” and “Elmsbüttel” in Hamburg and 287 participants from the district “Charlottenburg” in Berlin. All districts are very similar regarding their proximity to the city center, good public transportation accessibility, but also poor parking facilities and good access to shopping and leisure facilities. A more detailed overview of the data collection is given by von Behren et al. (*24*). The other survey was conducted in Berlin (Germany) between October-2016 and January-2017 as part of an international comparative study. The 600 participants are not selected from certain districts but are distributed throughout Berlin. For a more detailed description of this international study we refer to Magdolen et al. (*25*).

### Survey design and data description

The research presented in this paper is based on the concept of a travel skeleton. This concept captures "typical" everyday travel, long-distance travel and psychological factors. No further details on the survey are given here, as it has already been described in detail in previous literature (*24–26*). In the following, we present a description of the selected variables from the dimensions of touristic travel, everyday travel, attitudes and norms as well as the spatial and sociodemographic characteristics used in this study.

*Touristic travel*

A special aspect of the travel skeleton is to capture occasional travel events such as touristic traveling. The participants reported the number and characteristics of two types of touristic travel: one-day trips and vacations. A travel purpose in detail is not queried. The touristic travel is distinguished by the fact that such activities take place outside the person's typical environment. The participants themselves subjectively assessed which part of their activities and related trips belong to this definition. No additional distance criterion was applied. The questions thus correspond to the UNWTO definition of tourism (*10*), which is why we refer in the following to touristic travel or tourism. The data collection on the touristic travel behavior in our study was divided into two parts. First, the overall number of one-day trips in the last three respectively two months and the number of vacations with a duration of at least two days in the last year were surveyed. From this information, which the participants report retrospectively, we extrapolate the one-day trips to one year in order to achieve comparability. The second part collects detailed information on the last three to four undertaken trips of the participants. These trips can be both one-day trips and vacation. The collected information includes the distance between home and the destination of the trip as well as the mode used.

*Everyday travel and sociodemographic characteristics*

To examine the relations between the everyday travel behavior and the touristic travel behavior, we used variables describing everyday travel. On the one hand, the type of undertaken activities of the individuals in everyday life is considered (*Daily leisure activities*). On the other hand, we involve the use of means of transport in everyday life. For this, we consider the share of trips done by car (private, taxi, car-sharing, etc.) and public transportation (*High share of car use* and *High share of PT use*). For our analyses, we additionally divided households in different types. Detailed explanations are given in Table 1.

*Attitudes and norms*

In addition to travel behavior and sociodemographic characteristics, the participants were questioned about their attitudes towards certain modes and about ecological norms by an item set of 27 items from Hunecke et al. (*21*). The item set is based on the theory of planned behavior and focuses on everyday travel behavior. Since we aim to describe the ecological aspect of behavior, we selected 9 items on the personal and social norms regarding the use of eco-friendly modes as well as the attitudes towards public transportation for further analyses. The participants rate on a Likert-scale from 1 to 5 if the given statements apply or do not apply. We try to investigate, if the measured attitudes regarding everyday life have also influence on the touristic travel behavior or if we find discrepancies between this psychological dimension and the behavior. The items used in this study are listed in Table 1.

**Table 1. Selected psychological items (indicators) and variable description**

| *Indicators* | *Statements* |
|---|---|
| $I_1^{PT}$ | It is my intention to use public transportation instead of a car for the things I do in everyday life. |
| $I_2^{PT}$ | I have resolved to travel the ways I need to go in everyday life using buses and trains. |
| $I_3^{PT}$ | I appreciate public transportation, because there is usually something interesting to see there. |
| $I_4^{PT}$ | I can easily use the traveling time on the bus or train for other things. |
| $I_5^{PT}$ | I can relax well in public transportation. |
| $I_1^{Norm}$ | Due to my principles, I feel personally obligated to use eco-friendly means of transportation for the things I do in everyday life. |
| $I_2^{Norm}$ | I feel obligated to make a contribution to climate protection via my choice of transportation. |
| $I_3^{Norm}$ | People who are important to me think it is good if I would use public transportation instead of a car for things I do in everyday life. |
| $I_4^{Norm}$ | People who are important to me think that I should use public transportation instead of a car. |
| ***Variables*** | ***Description*** |
| *Sociodemograhic characteristics* | |
| Household type 1 | Small households with 1 to 2 persons, that are employed |
| Household type 2 | Small household with no employed persons |
| Household type 3 | Household with 3 or more persons including children |
| Household type 4 | 3 or more persons, but all of them are adults |
| *Everyday travel* | |
| Daily leisure activities | Dummy variable, describes if persons have reported to perform leisure activities on a daily bases |
| High share of car use | Dummy variable, describes if the reported behavior shows that 60% or more of trips are done by car |
| High share of PT use | Dummy variable, describes if the reported behavior shows that 60% or more of trips are done by the public transportation |
| *Spatial structure* | |
| High PT quality | Dummy variable, which describes the density of public transportation stops within the zip code area. High PT quality applies if there are at least 90 stops, which is true for about 10% of the participants |
| High population density | Dummy variable, which describes whether the population density of the zip code area is over 16,000 people per built-up space. This applies to about 10% of participants in the sample. |

*Spatial characteristics*

The present study focuses on the tourism behavior of people from urban areas. Besides the classification into the cities Hamburg and Berlin, we provide further information by means of the zip code of the participants' place of residence. In the survey conducted in Hamburg and Berlin, the participants are allocated into two zip codes each. The 600 participants from Berlin out of the

international survey are sampled from the entire city area, which is why information from many zip codes are needed. By using information available from open street map and the data provider NEXIGA, we calculate and aggregate information to derive figures about population density and the density of public transportation stops at zip code level (see Table 1). With these dummy variables *High PT quality* and *High population density* it is possible to identify which persons in the sample have their place of residence in a highly urban spatial structure and can be labeled as urbanites. A limitation has to be considered in the following interpretations regarding the spatial aspects. Whereas in Berlin we have a number of different zip codes and respectively differing spatial characteristics in the sample from the international survey, the persons from Hamburg are distributed between only two zip codes. The spatial characteristics therefore barely vary among the persons from Hamburg. However, to describe differences in the urban structure and its influences on the travel behavior the use of *High PT quality*, *High population density* and the dummy variable *From Berlin*, which describes if the place of residence is in this city, showed to be sufficient in the further analyses.

## DEFINITION OF TRAVEL TYPES AND DESCRIPTIVE ANALYSIS

For the following investigations, the persons of the sample are assigned into different travel groups. This is for a differentiation and classification of the individuals and their reported touristic travel behavior. We first explain the classification into these groups, which we take from the literature and apply to our data. A descriptive analysis of the characteristics is carried out and we highlight the first identified differences between the individuals.

### Classification in travel groups

As described in the literature review, influencing variables from the dimension of sociodemographic characteristics, psychology and spatial structure are relevant for the touristic travel behavior of persons. To identify and classify these influences in our study, we split the participants up into different groups. This approach was already carried out by Böhler et al. (*8*) and allows to reduce complexity. We apply the same classification and assign the persons in our sample to the different groups by examining the reported trip with the longest distance. After excluding participants with missing data in important variables, 1,007 individuals remain in our analysis. Böhler et al. (*8*) point out that the classification based on the furthest distance is more relevant to the development of measures than the frequency of travel. In the sample, 32 participants reported neither day trips nor vacation in the past year. Since this is a very small number, we summarize them with the group of *local travelers* who have reported a touristic travel of up to 600 km. The group *long-haul traveler* includes participants that reported a trip with a distance of at least 3,000 km. This group is of special interest, since such trips are likely to be undertaken by air travel. The group in between the *local and non-travelers* and the *long-haul travelers* is described as *mid-distance travelers*. The total sample examined is divided into 502 *local and non-traveler* (group 1), 363 *mid-distance traveler* (group 2) and 142 *long-haul traveler* (group 3).

## Descriptive analysis

A number of variables are available for describing the three groups. The characteristics regarding the person and the household, the everyday travel of the person, the touristic travel reported, the urban structure as well as the attitudes and norms are shown in Table 2. For an explanation of the complex variables, see Table 1.

Persons under 30 years are primarily found in the *mid-distance traveler* group. People older than 65, are most relevant in the group of *local and non-traveler*. The share of people non-working is also highest in the *local and non-traveler* group, while the highest share of people that are employed fulltime is in the *long-haul traveler* group. Education and income, which are considered as decisive factors, were not surveyed. The highest share of families with children (household type 3) are in the group of *mid-distance traveler*. This household type is the least common among the *long-haul travelers*. This result is consistent with literature: Young families with children primarily choose the car for their holiday trips (*8*). The share of people from households in Berlin is lowest in group 1. This means that many people from Hamburg are assigned in this group. When examining the urban characteristics, there is a clear trend observable. Group 1 has the lowest shares of *High PT quality* and *High population density*. This means that there are proportionately fewer urbanites than in the other groups. Together with the high number of persons from Hamburg, this indicates that the facilities or accessibility in Hamburg may have an influence on the classification to group 1.

The share of people with *Daily leisure acitvities* in each of the groups show another interesting result. 23.90% of group 1 undertakes leisure activities on a daily basis. People who do many recreational activities in everyday life, tend to travel less far. Those people might be students or pensioners who may have a lot of free time but less financial resources available for tourism. People that have less leisure activities during the week are likely to be a *long-haul traveler*. When analyzing the touristic travel behavior, we find a relation between the assignment to the three groups and the number of day trips per year. *Long-haul traveler* show the lowest number of day trips, but the highest number of vacations per year. Persons from group 1, on the other hand, show the highest number of day trips per year. When examining the mode used for the longest reported trip, we see, as expected, that the trips in group 3 were almost completely travelled by plane. Examining the mean values of the psychological indicators in the three groups, there is a slight tendency towards a decrease in the social and personal norms ($I_{1-4}^{Norm}$) from group 1 to group 3.

The descriptive analysis shows many similarities to findings from the literature. We further intend to explore which characteristics explicitly influence the person's tourtistic travel. The methodological approach is presented in the following.

1 **Table 2 Descriptive analysis of the groups and the sample**

| | **Local and non-traveler** (Group 1) | **Mid-distance traveler** (Group 2) | **Long-haul traveler** (Group 3) | **Total sample** |
|---|---|---|---|---|
| N | 502 | 363 | 142 | 1,007 |
| *Person characteristics* | | | | |
| Younger than 30 | 16.53% | 23.14% | 15.49% | 18.77% |
| Between 30 and 65 | 62.75% | 67.22% | 71.83% | 65,64% |
| Older than 65 | 20.72% | 9.64% | 12.68% | 15.59% |
| | *100.00%* | *100.00%* | *100.00%* | *100.00%* |
| Male | 47.81% | 51.79% | 48.59% | 49.35% |
| Driver's license | 84.86% | 85.67% | 88.73% | 85.70% |
| Full-time worker | 43.43% | 55.10% | 61.27% | 50.15% |
| Part-time worker | 12.55% | 12.67% | 9.15% | 12.11% |
| Non-worker (pensioners, students and others) | 44.02% | 32.23% | 29.58% | 37.74% |
| | *100.00%* | *100.00%* | *100.00%* | *100.00%* |
| *Household characteristics* | | | | |
| Household type 1 | 39.04% | 44.08% | 57.04% | 43.40% |
| Household type 2 | 31.87% | 21.21% | 18.31% | 26.12% |
| Household type 3 | 20.32% | 26.17% | 12.68% | 21.35% |
| Household type 4 | 8.76% | 8.54% | 11.97% | 9.14% |
| | *100.00%* | *100.00%* | *100.00%* | *100.00%* |
| From Berlin | 56.37% | 75.76% | 82.39% | 67.03% |
| Car in household | 49.80% | 56.20% | 58.45% | 53.33% |
| *Urban characteristics* | | | | |
| High PT quality | 6.18% | 14.60% | 16.90% | 10.72% |
| High population density | 5.98% | 14.88% | 16.90% | 10.72% |
| *Everyday travel behavior* | | | | |
| Daily leisure activities | 23.90% | 17.36% | 9.86% | 19.56% |
| High share of car use | 13.75% | 12.40% | 20.42% | 14.20% |
| High share of PT use | 19.52% | 11.85% | 8.45% | 15.19% |
| *Touristic travel behavior* | | | | |
| Vacations per year | 4.18 | 3.77 | 4.70 | 4.11 |
| Daytrips per year | 9.30 | 6.63 | 5.38 | 7.78 |
| Longest trip by air travel | 1.07% | 56.11% | 91.55% | 38.36% |
| *Attitudes and norms* | | | | |
| $I_1^{Norm}$ | 3.50 | 3.42 | 3.23 | 3.43 |
| $I_2^{Norm}$ | 3.50 | 3.46 | 3.25 | 3.45 |
| $I_3^{Norm}$ | 3.23 | 3.17 | 2.92 | 3.16 |
| $I_4^{Norm}$ | 2.58 | 2.74 | 2.51 | 2.63 |
| $I_1^{PT}$ | 3.56 | 3.50 | 3.27 | 3.49 |
| $I_2^{PT}$ | 3.13 | 3.03 | 2.82 | 3.05 |
| $I_3^{PT}$ | 2.98 | 2.95 | 2.87 | 2.96 |
| $I_4^{PT}$ | 3.52 | 3.46 | 3.55 | 3.50 |
| $I_5^{PT}$ | 3.62 | 3.55 | 3.54 | 3.58 |

## METHODS

In this section, we present our methodology to examine the influences of the different dimensions on the touristic travel behavior of the individuals. First, we describe the undertaken principal component analysis, to reduce the complexity of the psychological indicators and to include them in further analyses. Second, we describe the logistic regression model applied for the identification of the most relevant variables.

### Principal component analysis

The attitudes towards the means of transport as well as the ecological norms become apparent in the answers to the psychological questions in the survey. For a further analysis of these indicators (see Table 1), we conduct a principal component analysis (PCA), which is often used in literature (*24*). The PCA involves the 9 indicators to describe the psychological dimension and combines the information into a fewer number of components. The resulting component pattern as well as the criteria for extracting the number of components are shown in Table 3.

**Table 3. Results of the principal component analysis (PCA) - varimax rotated pattern**

| | ***Principal components*** | |
|---|---|---|
| | *Component 1: Pro-PT* | *Component 2: Norm* |
| Cronbach's alpha | α = *0.82* | α = *0.78* |
| ***Indicators in PCA*** | | |
| $I_5^{PT}$ | 0.783 | |
| $I_2^{PT}$ | 0.758 | |
| $I_3^{PT}$ | 0.723 | |
| $I_4^{PT}$ | 0.693 | |
| $I_1^{PT}$ | 0.686 | |
| $I_2^{Norm}$ | | 0.791 |
| $I_1^{Norm}$ | | 0.750 |
| $I_4^{Norm}$ | | 0.723 |
| $I_3^{Norm}$ | | 0.720 |
| Printed is the maximum loading of each indicator | | |
| ***Criteria of extraction and quality for PCA*** | | |
| *Criteria of extraction* | *# Factors* | |
| Kaiser´s criterion | 2 | |
| Scree test | 2 | |
| *Criteria of quality* | *Value* | *Pr > Chi-Square* |
| Kaiser´s measure of sampling adequacy (MSA) | 0.83>0.8 (good) | |
| Bartlett's test of sphericity | $\chi^2$ (36) = 3501.86 | p*** |

N=1,007

A PCA with a varimax rotation was applied. The PCA results in two principal components. Both the elbow criterion in the scree plot and Kaiser's criterion, which requires eigenvalues above 1.0, indicate two principal components as appropriate. One of the extracted component (component 1) describes aspects regarding the use of public transportation and is therefore named "Pro-PT". It describes whether people already use or intend to use the public transportation as well as their experiences with this means of transport. The other component "Norm" (component 2) combines the indicators questioning norms. It characterizes the norm towards environmentally-friendly behavior in personal and social terms.

### Logistic Regression Model

To determine the relevant parameters that influence whether people are *local and non-travelers*, *mid-distance* or *long-haul travelers*, we use a logistic regression model. Incorporating different variables into the model, we test to see which variables best predict the "choice" of group. For our model, four different types of variables are used (see Table 2). The first type describes the participants' sociodemographic characteristics (person and household context). The second type are variables on everyday travel, such as *Daily leisure activities*, *High share of car* and *public transport use*. Another type is the urban form, as we want to consider how the urbanity of the place of residence has an influence. Therefore, variables on *High PT quality* and *High population density* are included. As the last type, we include psychology to determine how the components (see Table 3) affects long-distance travel activities. We included the component "Pro-PT" in the model. However, it had no influence, which is why it was excluded for model improvement. The component "Norm" was recoded in a dummy variable *High norm regarding modes* and applies for the highest 25% cores in the sample. For the regression model estimate, we use the grouping of the participants as our dependent variable and apply the R- package *apollo* provided by the Choice Modelling Centre (*27*).

## RESULTS

The logistic regression model illustrates how various characteristics influence the probability of a person belonging to one of the three groups of travelers. Table 4 shows estimates and significance levels for the parameters included in the model. All variables have been defined as binary variables. Our reference category was local and non-traveler (group 1).

Results show that young people are more likely to be in group 2, whereby persons over 65 being less likely. Not surprisingly, full-time workers are more likely to be in groups 2 and 3. The probability is highest in group 3. This of course is related with available income. Interestingly, people from Berlin are more likely to travel long distances. This might be due to the higher internationality of the city and the better airport facilities. Regarding household types, it becomes clear that people with children in the household (type 3) tend not to travel for very long distances. They are more likely to be found in groups 1 and 2. When children are taken along, it is often cheaper and easier to travel to destinations that can be reached by car. In the context of this study, we also examine the contrast between everyday travel and long-distance travel. The study shows that people who perform many leisure activities in everyday life are less likely to be in group 3 (long-haul traveler). In addition, we also analyzed the use of modes in everyday travel. People who use a lot of public transit or the car are rather not in group 2. People with high public transit use

have a lower probability to be in the groups 2 and 3. In addition, we examine whether people who live in highly urban areas are more likely to travel long distances. The results confirm this assumption. Especially population density is a good proxy for urbanity. In other words, people living in highly urban areas are most likely to be a long-haul traveler, which may be for compensation reasons. This group also has the highest share of air travel. This effect is reinforced by High PT quality, which can be regarded as another indication of urbanity. However, these effects of urban structure are weakened if people have a high norm and it is important to them that their choice of transport mode is sustainable in everyday travel. People with high norms are less likely to be long-haul travelers. In summary, the tendencies from the descriptive analysis were confirmed and it is possible to see the level of influence of the various properties through the logistic regression.

**Table 4. Results - Logistic regression**

| | | Parameter estimates | |
|---|---|---|---|
| **No.** | **Variable** | **Mid-distance traveler (group 2)** | **Long-haul traveler (group 3)** |
| 0 | Intercept | -1.1031*** | -1.9160*** |
| 1 | Younger than 30 years | 0.3771*** | -0.2122 |
| 2 | Older than 65 years | -0.4268** | |
| 3 | Full-time worker | 0.3470* | 0.6261*** |
| 4 | Nonworker | -0.2887 | |
| 5 | From Berlin | 0.8356*** | 1.1345*** |
| 6 | Car in household | 0.2757** | |
| 7 | Household type 2 | | -0.6315** |
| 8 | Household type 3 | 0.2370* | -0.7338** |
| 9 | Daily leisure activities | | -0.5564** |
| 10 | High share of car use | -0.3217* | |
| 11 | High share of PT use | -0.3827** | -0.6371** |
| 12 | High PT quality | 0.4351** | 0.4603* |
| 13 | High population density | 0.5463** | 0.7494*** |
| 14 | High norm regarding modes | -0.1885 | -0.5292** |

***,**,* = significance at 1%,5%,10%-level
LL (0) = -1,106; LL (full model) = -921.66
McFadden pseudo $R^2$ = 0.17
N = 1,007

## CONCLUSIONS

Our study emphasizes the relevance to analyze touristic travel in comparison to everyday travel behavior. The inclusion of sociodemographic, spatial and psychological characteristics, that influences everyday travel, allows also the identification of effects on touristic travel behavior. Through the classification into the three groups of *local and non-travelers*, *mid-distance travelers* and *long-haul travelers*, which was adapted from Böhler et al. (*8*), we were able to identify relations between the individual characteristics and the long-distance travel of the participants. Our study reflects findings from literature, such as the influence of sociodemographic characteristics on long-distance travel. We determined the influences of urbanity: A high population density has a relevant influence on being a *mid-distance traveler* and even more on being a *long-haul traveler*. Due to the data, the information on income could not be included. However, the occupation status and urbanity (high rent and house prices) serves as proxies. Full-time workers are likely to be in the group of *long-haul traveler*. With increasing income, people have the chance to travel to more distant destinations. Regarding the ecological norm, the people in our sample behave consistently in everyday travel and long-distance travel. The norms towards the use of eco-friendly modes of transport play obviously an important role also for touristic travel. The higher the norm, the less likely people undertake vacations more than 3,000 km away. An interesting outcome of this study is that the effects of urban characteristics to be a *long-haul traveler* exceed the effects of the norm to travel not so far distances. People living in Berlin and in areas with a high population density with high PT quality are likely to be in this *long-haul traveler* group, even if the norm towards the use of eco-friendly modes in everyday travel is high. Furthermore, people, that undertake leisure activities on a daily basis, are less likely to travel far away in their holiday trips. In other words, the distant trips of people who do fewer leisure activities in everyday life can be interpreted as a kind of compensation.

We identify differences between the cities of Berlin in Hamburg. This is rather surprising since we assume quite similar urban characteristics. The differences may result from different conditions regarding long-distance accessibilities. Hamburg has a more peripheral location in Germany and the airport has a lower hub function in comparison to the airports in Berlin. We also consider Berlin more international. The high proportion of *long-haul travelers* could be explained for older people by a possible socialization living isolated in former West Berlin to travel further distances for a holiday trip. However, this is only an assumption and research should continue in this direction.

Since the environmental awareness has increased and the discussion in society on climate impacts of traveling became more relevant recently, further research should focus on the interrelation between attitudes and long-distance travel. It would be of interest, if the recent processes lead to a change in attitudes and if this has effects on the long-distance behavior. In our study we could only identify, that even if such pro-environmental attitudes exist, other characteristics still have more influence on the long-distance travel behavior. When developing measures and policies to limit long-distance travel, a possible change in values and attitudes should be considered.

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## AUTHOR CONTRIBUTIONS

The authors confirm contribution to the paper as follows: literature review: Magdolen; data preparation: Magdolen; data analysis: von Behren, Magdolen; interpretation of results: Magdolen, von Behren, Chlond, Vortisch; draft manuscript preparation: Magdolen. All authors reviewed the results and approved the final version of the manuscript.

## REFERENCES


1. Aamaas, B., J. Borken-Kleefeld, and G. P. Peters. *The climate impact of travel behavior: A German case study with illustrative mitigation options. Environmental Science & Policy*, Vol. 33, 2013, pp. 273–282, http://dx.doi.org/10.1016/j.envsci.2013.06.009.
2. Lenzen, M., Y.-Y. Sun, F. Faturay, Y.-P. Ting, A. Geschke, and A. Malik. *The carbon footprint of global tourism. Nature Climate Change*, Vol. 8, No. 6, 2018, pp. 522–528, http://dx.doi.org/10.1038/s41558-018-0141-x.
3. Henly, J. *#stayontheground: Swedes turn to trains amid climate 'flight shame'. The Guardian*, 04.06.2019.
4. Frick, R., and B. Grimm. *Langstreckenmobilität - Aktuelle Trends und Zukunftsperspektiven*, 2014.
5. Zumkeller, D., B. Chlond, J. Last, and W. Manz. *Long-Distance Travel in a Longitudinal Perspective: The INVERMO Approach in Germany. TRB 85th Annual Meeting Compendium of Papers*, Washington, D.C., 2006.
6. Reichert, A., and C. Holz-Rau. *Mode use in long-distance travel. Journal of Transport and Land Use*, Vol. 8, No. 2, 2015, http://dx.doi.org/10.5198/jtlu.2015.576.
7. Holz-Rau, C., and K. Sicks. *Stadt der kurzen Wege und der weiten Reisen. Raumforschung und Raumordnung*, Vol. 71, 2013, pp. 15–31, http://dx.doi.org/10.1007/s13147-012-0205-8.
8. Böhler, S., S. Grischkat, S. Haustein, and M. Hunecke. *Encouraging environmentally sustainable holiday travel. Transportation Research Part A: Policy and Practice*, Vol. 40, No. 8, 2006, pp. 652–670, http://dx.doi.org/10.1016/j.tra.2005.12.006.
9. Axhausen, K. W., J.-L. Madre, J. Polak, and P. L. Toint, eds. *Capturing long-distance travel.* Research Studies Press, Baldock, Hertfordshire, 2003.
10. World Tourism Organiation (UNWTO). *Understanding Tourism: Basic Glossary*, 2007. http://cf.cdn.unwto.org/sites/all/files/docpdf/glossaryenrev.pdf.
11. EUROSTAT. *Methodological manual for tourism statistics*, 2013.
12. Barr, S., and J. Prillwitz. *Green travellers? Exploring the spatial context of sustainable mobility styles. Applied Geography*, Vol. 32, No. 2, 2012, pp. 798–809, http://dx.doi.org/10.1016/j.apgeog.2011.08.002.
13. Forschungsgemeinschaft Urlaub und Reisen e.V. (FUR). *ReiseAnalyse 2019 - Erste ausgewählte Ergebnisse der 49. Reiseanalyse zur ITB 2019*, 2019.

14. Limtanakool, N., M. Dijst, and T. Schwanen. *The influence of socioeconomic characteristics, land use and travel time considerations on mode choice for medium- and longer-distance trips. Journal of Transport Geography*, Vol. 14, No. 5, 2006, pp. 327–341, http://dx.doi.org/10.1016/j.jtrangeo.2005.06.004.
15. LaMondia, J. J., L. Aultman-Hall, and E. Greene. *Long-Distance Work and Leisure Travel Frequencies: Ordered Probit Analysis Across Non–Distance-Based Definitions. Transportation Research Record: Journal of the Transportation Research Board, No. 2413*, 2014, pp. 1–12.
16. Czepkiewicz, M., J. Heinonen, and J. Ottelin. *Why do urbanites travel more than do others? A review of associations between urban form and long-distance leisure travel. Environmental Research Letters*, Vol. 13, No. 7, 2018, http://dx.doi.org/10.1088/1748-9326/aac9d2.
17. Holden, E., and I. T. Norland. *Three Challenges for the Compact City as a Sustainable Urban Form: Household Consumption of Energy and Transport in Eight Residential Areas in the Greater Oslo Region. Urban Studies*, Vol. 42, No. 12, 2005, pp. 2145–2166, http://dx.doi.org/10.1080/00420980500332064.
18. Holden, E., and K. Linnerud. *Troublesome Leisure Travel: The Contradictions of Three Sustainable Transport Policies. Urban Studies*, Vol. 48, No. 14, 2011, pp. 3087–3106, http://dx.doi.org/10.1177/0042098010396234.
19. Ory, D. T., and P. L. Mokhtarian. *When is getting there half the fun? Modeling the liking for travel. Transportation Research Part A: Policy and Practice*, Vol. 39, 2-3, 2005, pp. 97–123, http://dx.doi.org/10.1016/j.tra.2004.09.006.
20. Ajzen, I. *The theory of planned behavior. Organizational Behavior and Human Decision Processes*, Vol. 50, No. 2, 1991, pp. 179–211, http://dx.doi.org/10.1016/0749-5978(91)90020-T.
21. Hunecke, M., S. Haustein, S. Böhler, and S. Grischkat. *Attitude-Based Target Groups to Reduce the Ecological Impact of Daily Mobility Behavior. Environment and Behavior*, Vol. 42, No. 1, 2010, pp. 3–43, http://dx.doi.org/10.1177/0013916508319587.
22. Hunecke, M., S. Haustein, S. Grischkat, and S. Böhler. *Psychological, sociodemographic, and infrastructural factors as determinants of ecological impact caused by mobility behavior. Journal of Environmental Psychology*, Vol. 27, 2007, pp. 277–292, http://dx.doi.org/10.1016/j.jenvp.2007.08.001.
23. Becken, S. *Tourists' Perception of International Air Travel's Impact on the Global Climate and Potential Climate Change Policies. Journal of Sustainable Tourism*, Vol. 15, No. 4, 2007, pp. 351–368, http://dx.doi.org/10.2167/jost710.0.
24. von Behren, S., C. Minster, M. Magdolen, B. Chlond, M. Hunecke, and P. Vortisch. *Bringing travel behavior and attitudes together: An integrated survey approach for clustering urban mobility types. TRB 97th Annual Meeting Compendium of Papers*, Washington, D.C., 2018.

25. Magdolen, M., S. von Behren, B. Chlond, M. Hunecke, and P. Vortisch. *Combining attitudes and travel behavior - A comparison of urban mobility types identified in Shanghai, Berlin and San Francisco. TRB 98th Annual Meeting Compendium of Papers,* Washington, D.C., 2019.
26. von Behren, S., C. Minster, J. Esch, M. Hunecke, P. Vortisch, and B. Chlond. *Assessing car dependence: Development of a comprehensive survey approach based on the concept of a travel skeleton. Transportation Research Procedia*, Vol. 32, 2018, pp. 607–616, http://dx.doi.org/10.1016/j.trpro.2018.10.015.
27. Hess, S., and D. Palma. *Apollo: a flexible, powerful and customisable freeware package for choice model estimation and application. Journal of Choice Modelling*, 2019.