Green mobility and well-being*

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ABSTRACT

In recent years, efforts to promote alternative and greener modes of transport have been aimed at boosting sustainable economic growth. The question of mode choice calls for an analysis of how different modes of transport relate to the well-being of users. We use the UK Time Use Survey (UKTUS) from 2014-2015, and examine data on self-reported enjoyment during travel, as a measure of experienced well-being. We estimate Random Effects regressions for each travel category, finding that, in comparison to driving by car, active transport is related to higher levels of well-being during travel, while using public transport is associated with lower levels of well-being in certain trips. The results show that active transport is related to higher levels of well-being on a daily basis and across different travel purposes. Our evidence suggests a need to develop strategies to effectively promote mobility by active modes of transport, improving the daily experience of public transport users.

Keywords: subjective well-being; walking/cycling; public transport

JEL codes: R4 - J22

* This paper has benefitted from funding from the Government of Aragón (Grant S32_20R, funded by Program FSE Aragón 2014–2020) and the Spanish Ministry of Science and Innovation (Project PID2019-108348RA-I00, funded by MCIN/AEI/10.13039/501100011033).

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1. Introduction

Transport policies and travel behaviors are related to how economic activity affects the environment. For instance, transport currently accounts for a quarter of the European Union's (European Commission, 2019) greenhouse gas emissions (GHG), and almost one quarter of all energy-related GHG emissions in the world (UN, 2019). In 2016 in the United States, the transportation sector overtook the power sector as the primary source of GHG emissions (Bleviss, 2020). In the UK, households contribute substantially to the UK's total emissions - around 74% according to an estimate by Baiocchi, Minx and Hubacek (2010) - and transport activity is important in total emissions (Büchs and Schnepf, 2013).

In this context, reducing GHG emissions is important, since GHG emissions and air pollution have negative externalities on health, increasing respiratory and cardiovascular disease and the frequency of respiratory symptoms and use of medication by those with asthma and reduced lung function (WHO, 2006). In this regard, active transport is important not only because of its environmental benefits of reducing GHG emissions, but also because of the direct health benefits. Active transport practices are related to less pollution and thus better health outcomes (Mukhopadhyay and Forssell, 2005; Hall, Brajer and Lurmann, 2010; Powdthavee and Clark, 2019), and prior evidence has linked increased physical activity to improved cardiovascular outcomes (Hamer and Chida, 2008), decreasing overweight/obesity rates (Wen et al., 2006), and lower risk of hypertension (Hayashi et al., 1999). Thus, public policies aimed at tackling emissions derived from transport, with the objective of reducing environmental pollution and health problems, are necessary.

Within this framework, the European Union has set an objective of 90% emissions reduction by 2050, and the UK government has announced, as part of a national climate strategy, a plan to decarbonize transport, aiming to begin a "green transport revolution" based on alternative modes of transport and placing special emphasis on active transport, i.e., walking and cycling (Department for Transport, 2020). There are other, less-polluting modes of transport that may contribute to alleviate the environmental burdens of mobility, and an analysis of how green modes of transport interact with urban mobility is needed. Green modes of mobility include a variety of eco-friendly alternatives, including active (walking or cycling) and public transport, as well as car-sharing, carpooling, and electric scooters, among

others. In particular, the use of public transport reduces GHG emissions, although active modes of mobility (walking and cycling) are the most environmentally friendly solution for personal mobility, since they involve 'zero carbon' (Stanley and Watkiss, 2003, Chapman, 2007). In this context, urban planning strategies, improving transportation services, selecting appropriate investments, and promoting walking/cycling behavior are all important in reducing GHG emissions.

The analysis of the relationship between mode of transport and well-being may be helpful in understanding the ways of improving existing transportation services and prioritizing investments (Morris and Guerra, 2015). Furthermore, the connection between mode choice and well-being is still to be understood, given its complexity, and the empirical analysis of this relationship may help to advance our knowledge. Some prior research is in this line, such as Ettema et al. (2011), Erikson et al., (2013) and De Vos et al. (2016), who all find that public transport is associated with lower levels of well-being, while active travel brings greater benefits. These works rely on data from ad-hoc surveys and experiments and are based on the Satisfaction with Travel Scale (Ettema et al., 2011), which includes both cognitive and affective dimensions of well-being. More recent studies shift the focus to 'happiness' as the measure of emotional well-being, using data from the American Time Use Survey (Morris and Guerra, 2015; Zhu and Fan, 2018), finding that cyclists enjoy the most positive results, next happiest are car passengers, and then car drivers, while bus and train riders experience the most negative emotions.

Individual well-being consists of two dimensions: emotional well-being and cognitive well-being (Diener, 1984; 2009). Emotional (or affective) well-being refers to how individuals feel during an activity, and can be measured by specific positive and negative emotional experiences, such as enjoyment, happiness, joy, anxiety, sadness, stress, and anger (Kahneman and Deaton, 2010). Cognitive well-being refers to how individuals think, and consists of the cognitive judgment of satisfaction, or evaluations of one's life as a whole or of specific life domains, such as travel. Subjective well-being is generally measured by self-reported responses. Closely related to the concept of subjective well-being, developed in the economic discipline, is the notion of experienced utility, which refers to the experience of feelings and emotions resulting from the outcome of a choice. When experienced utility is measured in real time it is known as instant utility (Kahneman et al., 1997). Our work aims

to explore whether public transport and active transport are associated with higher levels of emotional well-being, in comparison to private driving, while traveling for paid work, unpaid work, personal care, childcare, and leisure.

We use the UK Time Use Survey (UKTUS) from 2014-2015, in which emotional well-being is measured by the level of enjoyment experienced during each travel activity.[1] We estimate Random Effects panel-data regressions to study differences in the levels of enjoyment when travelling via public transport or active transport, in comparison to private driving and public transport. In doing so, we further control for the scaling effect of individuals, allowing for an individual-specific interpretation of the enjoyment question. Our results indicate that walking/cycling is related to greater well-being in comparison to private transport, with the exception of travel for childcare. Public transport is related to lower levels of well-being during travel related to market work activities, in comparison to the use of private transport.

We contribute to the existing research by analyzing how the well-being of individuals during travel is related to the mode of transport (Ettema et al., 2011; Erikson et al., 2013; Morris and Guerra, 2015; De Vos et al., 2016), focusing on the individual enjoyment of each trip. The time-use nature of the data set allows for an in-depth analysis of the behavior of individuals, including the analysis of the use of green modes of transport and its relationship to individual enjoyment during each trip. The analysis of feelings during travel compliments prior analyses, using retrospective questions about travel satisfaction. The fact that we focus on the well-being of individuals while using public transport or walking/cycling, in the context of environmentally friendly or "green" modes of transport, helps to identify factors that encourage or discourage the use of alternative modes of urban mobility, along with identifying those groups who may, comparatively, encounter more problems when using alternative modes.

[1] As highlighted by Seligman and Csikszentmihalyi (2000, p.12), "*enjoyment is what leads to personal growth and long term happiness*". Thus, the analysis of enjoyment during travel activities is important for understanding the well-being of individuals.

The remainder of the paper is as follows. Section 2 presents a review of the literature. Section 3 presents the data and variables, Section 4 describes the empirical strategy, and Section 5 describes the results. Section 6 sets out our main conclusions.

2. Literature Review

Individuals who engage in pro-environmental behaviors are likely to have higher levels of life satisfaction (Schmitt et al., 2018; Welsch et al., 2021). However, no strong link has been established between individual green behavior and particular life domains, such as work-life balance (Melo et al., 2018), nor between individual carbon footprints and subjective well-being (Andersson et al., 2014; Verhofstadt et al., 2016).

The choice of the mode of transport is strongly linked with individual pro-environmental behavior. By relying on less-polluting modes of transport, in comparison to car driving, individuals can contribute to alleviate the environmental burdens of mobility. For example, public transport helps to reduce greenhouse gas emissions, while the use of active modes of mobility is the most environmentally friendly solution for personal mobility, since it involves 'zero carbon' (Chapman, 2007).

One strand of the literature has focused on examining the relationship between mode of transport and subjective well-being. The evidence indicates that car driving is related to higher levels of travel satisfaction compared to public transport use (Ettema et al., 2011; Eriksson et al., 2013; Páez and Whalen, 2010; Olsson et al., 2013). However, when analyzing negative emotions, car users present significantly higher levels of reported stress and negative moods, compared to public transport users (Werner and Evans, 2011). Among car users, the passenger is associated with a higher level of happiness than the driver (Morris and Guerra, 2015).

Regarding public transport, there is a negative association between travelling by bus and the emotional well-being of train users (De Vos et al., 2016; Ettema et al., 2011; Morris and Guerra, 2015; Wener and Evans, 2011). In turn, active modes of travel, which include walking and cycling, are related to higher levels of travel satisfaction (Olsson et al., 2013;

De Vos et al., 2016) and to higher levels of emotional well-being, compared to driving a car (Morris and Guerra, 2015; Zhu and Fan, 2018).

Studies analyzing subjective well-being and mode of travel have focused on travel as a whole, without differentiation by purpose (Ettema et al., 2011; Morris and Guerra, 2015; Zhu and Fan, 2018), or on one specific kind of travel, particularly commuting (Páez and Whalen, 2010; Wener and Evans, 2011; Erikson et al. 2013; Olsson et al., 2013) or on leisure trips (De Vos et al., 2016). To our knowledge, no prior work has examined and compared the relationship between alternative modes of transport and subjective well-being, for paid work, unpaid work, personal care, childcare and leisure travel.

The rationale for analyzing different types of travel separately relies on a separate but related line of research that documents differences in subjective well-being, depending on the purpose of the trip. Travelling for recreational purposes is associated with higher levels of emotional well-being compared to other purposes, such as work (Ettema et al., 2013; Mokhtarian et al., 2015). Trips with discretionary purposes (e.g., eating or drinking, leisure, exercise, and spiritual- or volunteering-related travel) are more enjoyable and more meaningful than commuting, educational, or household maintenance trips (Zhu and Fan, 2018). In turn, commuting is negatively related to the emotional well-being of individuals (Morris and Guerra, 2015; Giménez-Nadal and Molina, 2019). Given the differences in well-being across travel purposes, the positive relationship between travel satisfaction and active modes of travel could also be concentrated on specific travel purposes, or could be spread over all modes of transport, and the existing literature is not clear on this.

3. Data and Variables

We use the UK Time Use Survey (UKTUS) carried out between April 2014 and December 2015. The UKTUS is the official time use survey of the United Kingdom, conducted on behalf of the University of Oxford's Centre for Time Use Research (CTUR) by NatCen and the Northern Ireland Statistics and Research Agency (NISRA). The survey sample comprises 4,741 households in England, Scotland, Wales, and Northern Ireland, and follows the Harmonized European Time Use Survey (HETUS) guidelines, with certain adaptations

intended to tailor the survey to UK users and to ensure compatibility with the 2000-01 UK Time Use study.

The main instrument of this survey is the time use questionnaire. In the UKTUS, diaries are completed by respondents on selected days, with each diary divided into time intervals where the respondent records a main activity, and other features, such as the secondary activity carried out simultaneously with the primary activity, whether the activity was performed in the company of another person, where the activity took place, and the mode of transport. An extensive literature confirms the reliability and validity of diary data and its superiority over other time-use surveys based on stylized questions, asking respondents to estimate time in commuting on a 'typical day' (Robinson and Godbey 1985; Juster and Stafford 1985).

Time use data allow for an accurate measure of travel time in comparison with other datasets, since the main purpose of the activity is reported by the respondent. For instance, we can distinguish between pure commuting episodes and others that are ancillary activities, such as picking up children from school. Time use surveys provide information on duration, departure and arrival times, location, and mode of transport, and while they are inferior in comparison to other datasets, such as National Travel Surveys, they are complementary (Kitamura et al., 1997). The use of time-use surveys in transportation research has become common (Gimenez-Nadal and Molina, 2014; 2016; Jara-Díaz and Rosales-Salas, 2015; Gimenez-Nadal, Molina and Velilla, 2018a, 2018b), although one limitation of such surveys is that commuting distance is not recorded, so issues related to distance cannot be analyzed and used to explain travelling time.

We want to analyze the relationship between mode of transport and the feelings experienced during travel, and so we restrict the sample to travel episodes. We eliminate observations of respondents with missing information on feelings and/or socio-demographic characteristics, leaving a sample of 29,930 travel episodes from 4,586 individuals. We classify travel activities according to their purpose: travel related to paid work (to/from work), unpaid work (household care, shopping, organizational work and informal help of others, voluntary, civic and religious travel, etc.), personal care (personal business and physical exercise), childcare (escorting to/from school, escorting a child) and leisure

(walking, hiking, biking, skiing and skating, visiting friends/relatives, social activity, entertainment and cultural activities, gambling, day trip/just walking, etc.).[2] Table A.1 in the Appendix provides a detailed list of all travel activities included in each category. Table 1 reports the average time devoted to each travel category. We observe that the average duration of travel episodes is 21.61 minutes per day when travelling to work, 18.23 minutes per day in unpaid work travel, 18.34 minutes per day in personal care travel, 18.37 minutes per day in childcare travel, and 24.83 minutes per day in leisure-related travel.[3]

We analyze the relationship between mode of transport and the feelings experienced during travel. To that end, we classify survey information on mode of transport, following Gimenez-Nadal and Molina (2019). We focus on private transport (car, truck, or motorbike, both as driver or passenger), public transport (bus, subway, tram, boat, ferry, taxi, or airplane) and active transport (walking and cycling). Table 1 shows the average share of travel by each mode of transport. The most frequent mode is private car, ranging from 79% for personal care to 55% for leisure. After private car use, the active mode of transport is the most used by individuals in the UK. When we focus on the differences between modes of transport, the smallest differences between the proportion of private and public or active modes of transport are observed in leisure travel.

Our main variable of interest refers to the enjoyment reported by individuals during their travel. The UKTUS offers information on the level of enjoyment for the different activities in the diary, using the Day Reconstruction Method (Kahneman et al., 2004; Kahneman and Krueger, 2006). In the survey, respondents record their daily activities for the selected day, and in addition, information on emotional well-being (enjoyment) in real time during all daily episodes. In particular, respondents are asked "how much did you enjoy this time?", with answers ranging from 1, "not at all", to 7, "very much". With this information, we compute the level of enjoyment for each travel episode. Table 1 reports the average level of enjoyment experienced during different travel activities. On a scale from 1 to 7, the average level of

[2] For the activities, we follow Aguiar and Hurst (2007) and Gimenez-Nadal and Sevilla (2012) and consider the following five categories: paid work, unpaid work, personal care, childcare, and leisure.

[3] Regarding the proportion of travel time that each travel category represents, we observe that 19% of all travelling episodes are travels related to paid work, 32% to unpaid work, 5% to personal care, 10% to childcare and 34% to leisure. Percentages are computed at the diary level, and are calculated as a proportion of the total travel time in the diary.

enjoyment associated with travel episodes is between 4 and 5, with variability depending on the category. We observe that higher levels of enjoyment correspond to leisure (5.35) and personal care (5.18) travel, while lower levels are observed for commuting (4.61).

Table 2 shows the average enjoyment levels of travel activities, by mode of transport. The highest levels of enjoyment correspond to an active mode of transport in all the activities, while the lowest levels of enjoyment correspond to public transport. The average enjoyment of respondents during active modes is 4.82 in paid work travel, 5.16 in unpaid work travel, 5.49 in personal care travel, 5.03 in childcare travel, and 5.69 in leisure travel. Respondents using public transport report an average enjoyment level of 4.21 in paid work travel, 4.71 in unpaid work travel, 4.70 in personal care travel, 4.28 in childcare travel, and 4.95 in leisure travel. The level of enjoyment experienced during private driving is higher than when using public transport for all types of travel and, in turn, lower than when engaging in active transport (with the exception of childcare travel). All these differences in the well-being of travelers are statistically significant at the 1% level. In sum, active modes of transport are the most enjoyable, while public transport is the least enjoyable, which is consistent with prior evidence (Ettema et al., 2011; Erikson et al., 2013; De Vos et al. 2016).

4. Empirical Strategy

We analyze the relationship between the experienced well-being of individuals during different types of travel and the use of public and active modes of transport, compared to car driving. We estimate the following linear equation using Random Effects (RE) models.[4] Estimations are performed at the episode-level and separately for each travel category (travel related to paid work, unpaid work, personal care, childcare, and leisure). We estimate the following baseline specification:

[4] Ferrer-i-Carbonell and Frijters (2004) show that estimating ordered latent models (which assume ordinality of the well-being measure) or OLS models (which assume cardinality) makes little difference to the estimates. What matters the most is to control for unobserved heterogeneity in order to account for individual traits (as in RE models). Against this background, we have estimated OLS linear models (results shown in Table A4 of the Appendix), and results are consistent with those obtained using RE models. We have also estimated alternative models to test the robustness of our results. In particular, we estimate a linear ordered logit and RE ordered logit models (Crouchley, 1995). Results are shown in Tables A.5 and A.6 and are robust and consistent with our main results.

$$WB_{ij} = \alpha + \beta G_{ij} + \gamma X_i + \delta E_{ij} + \eta Z_i + \varepsilon_{ij} (1)$$

where WB_{ij} is the experienced well-being of individual i in travel episode j. Respondent's well-being is captured by the level of enjoyment experienced in each episode. We standardize WB_{ij} to obtain an average value of zero and standard deviation of 1 (i.e., z-score) so that each estimated coefficient can be interpreted as the change in terms of one standard deviation of enjoyment, where standardization is done using all episodes of the same travel activity (e.g., travel related to market work, related to housework).

G_{ij} is a vector of dummy variables to control for the use of public and active transport, which are compared to car driving (reference category). X_i is a vector of the socio-demographic characteristics including age (and its square), gender, education level (completed secondary or less, and university), native status, employment status (employed and unemployed), living in couple, household size, and number of children in the household. Descriptive statistics are reported in Table A.2 of the Appendix.[5] E_{ij} is a vector of variables used to control for cross-episode heterogeneity, and includes the duration of the episode (defined in log of minutes) and its square, to account for saturation affects, variables indicating the presence of others during each travel episode (travelling alone, with parents, with spouse, with child, with other family member, or with non-family) and an indicator variable if the travel took place on a weekday or at the weekend. Z_i controls for region of residence[6], month (January to December), and year (2014 or 2015) of the interview. Standard errors are robust, and the error term is clustered at the individual level in the OLS estimation. Observations are weighted at the individual level using survey weights.

The use of a scale to measure self-reported well-being is subject to different interpretations across individuals of what the scale of measurement really refers to, leading to a lack of independence across measures within a respondent (Kahneman and Krueger, 2006). To further consider the scaling effect of individuals, we augment the baseline specification of Eq. (1) to allow for an individual-specific interpretation of the enjoyment question. To that

[5] Table A.2. also shows that our sample closely mimics the mean socio-demographic characteristics of individuals in the 2011 England and Wales Census.

[6] North East, North West and Merseyside, Yorkshire and Humberside, East midlands, West midlands, East of England, London, South East, South West, Wales, Scotland, and Northern Ireland

end, we estimate three alternative specifications. First, we include as a control variable the average level of enjoyment of each individual in all non-travel episodes (paid work, unpaid work, personal care, childcare, and leisure). Second, we interact this variable with total time (minutes per day) spent in all non-travel episodes. Third, we include as a control variable the weighted average level of enjoyment of each individual in all non-travel episodes. For the weighted average of the level of enjoyment in non-travel episodes, we compute for each individual the sum of the average level of enjoyment in each non-travel activity weighted by the proportion of time spent on it, out of total non-travel time in the diary.[7] Table A.2 of the Appendix shows the average values of enjoyment during non-travel episodes, and we observe that, in comparison to travel activities, the average levels of well-being experienced in non-travel activities are slightly higher.

5. Results

Table 3 shows the results of estimating Equation (1) for each travel category. We are interested in the parameters of public and active modes of transport, which compare the average level of enjoyment when travelling for different purposes via public or active transport, to private driving. All regressions control for additional episode-level and socio-demographics characteristics.[8] Panel (A) in Table 3 shows the estimates of our baseline specification (Eq. (1)); walking and cycling are, on average, significantly and positively related to travel well-being, for different purposes, at standard statistical levels, with the exception of childcare. On the other hand, public transport is, on average, significantly and negatively related to well-being at standard statistical levels only in the case of paid work travel. Specifically, active transport is, in comparison to the use of private cars, related to higher levels of enjoyment of 0.087, 0.172, 0.209, and 0.330 of a standard deviation of

[7] The inclusion of the average enjoyment of non-travel activities may be subject to a composition effect, as those who travel less hours during the day may report higher levels of enjoyment simply because they have more leisure, for instance, and thus the variable to measure inter-personal differences in scale interpretations may be capturing only compositional effects. For this reason, we are including both the average enjoyment in non-travel activities, interacted with the time in non-travel activities, and the weighted average level of enjoyment of each individual in all non-travel episodes. That way, we are weighting the enjoyment of non-travel episodes by the duration of the episodes

[8] The full set of estimates is reported in Table A.3 in the Appendix.

enjoyment during paid work travel, unpaid work travel, personal care travel, and leisure travel, respectively. The use of public transport is, in comparison to the use of private cars, related to a comparatively lower level of enjoyment of 0.150 of a standard deviation of enjoyment during paid work travel. Results for public transport are consistent with prior evidence (Ettema et al., 2011; Erikson et al., 2013; De Vos et al. 2016), although here we show that this difference is restricted to paid work-related travel.[9]

Panels B to D of Table 3 control for individual unobserved heterogeneity, to consider the scaling effect of individuals. It could be that those individuals reporting greater enjoyment while using active transport also report higher levels of enjoyment during their non-travel activities, and thus the positive relationship between the use of active modes of transport and enjoyment is due to personal unobserved characteristics (i.e., differences in scale) and not to the mode of transport. To that end, Panel B shows the results of including the individual average level of enjoyment in all non-travel episodes (paid work, unpaid work, personal care, childcare, and leisure activities) as a control variable in the estimations. Panel C includes the interaction between the individual average level of enjoyment in all non-travel episodes with total time (minutes per day) spent in all non-travel episodes. Panel D shows the results of including the individual weighted average level of enjoyment in each non-travel activity.

These results, where individual unobserved heterogeneity is controlled for, are similar to those in Panel A of Table 3. Walking and cycling are significantly and positively related to well-being while travelling for different purposes, with the exception of childcare, while public transport is significantly and negatively related to well-being in the case of paid work travel, in comparison to the use of private transport. Furthermore, we observe that the average level of enjoyment in all non-travel episodes is positively related to the level of enjoyment experienced during different kinds of travel (Panel B), indicating the existence of a heterogeneity of individuals in scales, since individuals who report higher levels of well-

[9] A comparison of OLS and RE results shows that with the RE estimation public transport is less frequently related to lower well-being than with the OLS estimation. This may indicate that the relation between public transport and well-being in the UK may not be as negative as found in previous research. However, given that we cannot talk about causality, interms of mode of transport and well-being, we do not know whether this difference is caused by the unobserved heterogeneity of individuals, or there are time-varying unobserved factors affecting this relationship.

being in non-travel activities also report higher levels of well-being when travelling.[10] The same effect is found for the weighted average level of enjoyment (Panel D).

6. Conclusions

This paper analyses the well-being of individuals in the UK during their travel activities. We estimate Random Effects panel regressions for each travel category to study differences in the level of emotional well-being (captured by individual enjoyment) when travelling via public transport or active transport, in comparison to private driving. Our results indicate that, in general, walking/cycling is related to higher levels of well-being, in comparison to private transport, while the use of public transport is related to lower well-being levels during travel related to market work activities, in comparison to the use of private transport. These results are in line with the literature indicating that public transport is associated with lower levels of satisfaction, although existing evidence focuses only on commuting to work. Possible explanations include uncomfortable and crowded service, indirect routes, costs, and lack of safety, reliability, and punctuality (Mann and Abraham, 2006). On the other hand, higher levels of well-being during walking and cycling may be related to improvements in health conditions as well as the physiological benefits derived from feelings of freedom, control, and autonomy (Vella-Broderick and Delbosc, 2011), or the sense of doing something to help the environment (Schmitt et al., 2018). Further research should disentangle what corresponds to the former and what corresponds to the latter.

Understanding the many and varied factors that influence the decision to adopt more environmentally friendly modes of transport by green-oriented citizens is fundamental to the transition towards a new era of sustainable development (Brundtland Report, 1987). Our results show that walking and cycling may have benefits beyond the typical health and environmental ones, and that improving riders and pedestrians' emotional experience may

[10] This relationship could also be interpreted as a "cheering" effect of active modes of transport on non-travel activities (Gimenez-Nadal and Molina, 2015). That is, those individuals who use active modes of transport could enjoy other non-travel activities more, because the positive effects of active modes of transport (and also the health benefits of physical activity) on enjoyment are extended to other non-travel activity. In the same vein, the relationship between lower enjoyment of travel by public transport and lower enjoyment in non-travel activities could be due to a "saddening" effect (Knabe et al., 2010). We cannot analyze causality issues with the data at hand, and thus we cannot test these hypotheses.

be as important as improving traditional service features. Furthermore, developing strategies to promote alternative modes of mobility via physical activity may reduce gas emissions while significantly enhancing traveler experiences. Thus, appropriate investments in infrastructure related to walking and cycling are crucial to aid in the "greening" of individual behaviors in travel activities, which would complement strategies to produce behavioral changes in favor of pro-environmental behaviors, such as shifting consumption patterns to relatively low-impact alternatives, or decreasing overall consumption (Stern et al., 1997; Shwom and Lorenzen, 2012; Schmitt et al, 2018). But if sustainability is to be achieved by increasing the use of public transport, more effort should be made to improve the experiences of users, in light of their significantly lower levels of well-being. Strategies in this line may involve better safety and comfort measures, more direct routes, reliability, punctuality, and less-crowded services (Mann and Abraham, 2006).

Furthermore, in the planning and development of "environment-friendly" infrastructures, it is important to note that, even though the choice of the mode of transport is related to the well-being experienced during car driving and public transport, on the one hand, and active transport, on the other, are not always substitutes for each other when travelling long distances. In cases where the use of public transport is the only alternative to car driving, policies should be aimed at reducing the functional, psychological, and cultural values of private cars (Steg, 2003), as well as increasing the performance of public transport. Alternatively, policies may be focused on promoting the combination of modes of transport (e.g., walking/cycling + public transport), together with a combination of infrastructures that allow for these combinations (e.g., intermodal stations). The analysis of these combinations of modes of transport in comparison to driving cars could be useful in assessing travellers' well-being.

The present work puts into perspective the importance of Time Use Surveys (TUS) in the analysis of travel behaviors, especially those datasets with information on the feelings/enjoyment reported during the activities (e.g., American Time Use Survey Well Being Module, UK Time Use Survey 2014-15). TUS allows for an in-depth analysis of the travel behaviors of individuals, since it contains a detailed description of all the activities of individuals in the reference day, including travel episodes. This information allows for an analysis of the proportion of travel time using different modes of transport, including walking

and cycling, which explains why the use of TUS in transportation research has become common. Furthermore, TUS with information on feelings, like the UK TUS 2014-15, allows for a direct analysis of each travel episode and the associated feeling, which contrasts with prior analyses of travel based on retrospective questions or experiments. If it is possible to link mode of transport and the reported feeling at the episode level, the causal link between mode choice and well-being may be closer to being disentangled.

One limitation of our analysis is that our data is formed by a cross-section of individuals, and thus we cannot talk directly about causality. There could be time-variant, personal, unobserved factors related to both the level of well-being during travel activities and the choice of the mode of transport. Furthermore, the well-being of individuals is measured with one variable only, that refers to the enjoyment of the activity. The emotional well-being of invididuals is composed of positive and negative emotional experiences, such as enjoyment, happiness, joy, anxiety, sadness, stress, and anger, and we are focusing on one emotional experience only. Future research should analyze, with the appropriate data, whether the higher level of well-being while walking/cycling, in comparison with car driving, is also present when other emotional experiences are examined (e.g., tirednesss). For instance, individuals can enjoy more walking/cycling than driving, but they can also report higher levels of tiredness.

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Table 1. Descriptive Statistics by Travel Category

	Paid work		**Unpaid work**		**Personal care**		**Childcare**		**Leisure**	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
time in travel category (in minutes)	21.61	18.46	18.23	15.93	18.34	14.17	18.37	14.39	24.83	26.55
share of travels by private mode of transport	0.64	0.48	0.76	0.43	0.79	0.41	0.58	0.49	0.55	0.50
share of travels by public mode of transport	0.17	0.37	0.07	0.26	0.05	0.21	0.11	0.31	0.15	0.35
share of travels by active mode of transport	0.19	0.40	0.17	0.38	0.17	0.37	0.31	0.46	0.30	0.46
enjoyment in travel activities	4.61	1.50	5.00	1.40	5.18	1.35	4.99	1.45	5.35	1.41
Number of episodes	5,734		9,499		1,510		2,915		10,272	

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. The level of enjoyment experienced by individuals in each episode is scaled from 1 ("not at all") to 7 ("very much").

Table 2. Average Enjoyment Levels by Mode of Transport

	(i) private		**(ii) public**		**(iii) active**		**(iv) = (i) - (ii)**		**(v) = (i) - (iii)**	
	Mean	S.D	Mean	S.D	Mean	S.D.	mean diff.	p-value	mean diff.	p-value
paid work	4.65	0.02	4.21	0.05	4.82	0.04	0.44	0.0000	-0.16	0.0000
unpaid work	4.99	0.02	4.71	0.06	5.16	0.03	0.28	0.0000	-0.17	0.0000
personal care	5.15	0.04	4.70	0.15	5.49	0.08	0.45	0.0000	-0.34	0.0000
childcare	5.10	0.03	4.28	0.09	5.03	0.05	0.81	0.0000	0.07	0.0000
leisure	5.28	0.02	4.95	0.04	5.69	0.02	0.33	0.0000	-0.41	0.0000

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. The level of enjoyment experienced by individuals in each episode is scaled from 1 ("not at all") to 7 ("very much"). Columns (iv) and (v) report the difference in the average level of enjoyment across modes of transport for each type of travel, together with using t-type tests on the equality of means.

Table 3. RE Regression of the Level of Enjoyment by Travel Category

	Paid work		Unpaid work		Personal care		Childcare		Leisure	
Panel (A)										
public mode of transport	-0.150***	(0.046)	-0.058	(0.054)	-0.047	(0.141)	-0.093	(0.080)	-0.036	(0.043)
active mode of transport	0.087**	(0.039)	0.172***	(0.040)	0.209**	(0.082)	0.077	(0.051)	0.330***	(0.029)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.049		0.056		0.092		0.118		0.099	
Panel (B)										
public mode of transport	-0.139***	(0.042)	-0.070	(0.046)	-0.058	(0.129)	-0.144*	(0.076)	-0.070*	(0.039)
active mode of transport	0.116***	(0.034)	0.173***	(0.036)	0.244***	(0.070)	0.071	(0.046)	0.327***	(0.026)
average enjoyment non-travel ep.	0.601***	(0.018)	0.641***	(0.016)	0.681***	(0.036)	0.616***	(0.028)	0.595***	(0.016)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.305		0.363		0.374		0.354		0.337	
Panel (C)										
public mode of transport	-0.139***	(0.042)	-0.065	(0.046)	-0.052	(0.129)	-0.150**	(0.076)	-0.069*	(0.039)
active mode of transport	0.115***	(0.034)	0.174***	(0.036)	0.245***	(0.070)	0.068	(0.046)	0.327***	(0.026)
average enjoyment non-travel ep.	0.593**	(0.302)	0.466*	(0.250)	0.427	(0.594)	0.195	(0.388)	0.334	(0.251)
total time in non-travel episodes (in log)	0.031	(0.226)	-0.072	(0.202)	-0.288	(0.487)	-0.373	(0.302)	-0.184	(0.204)
average enjoyment * total time non-travelling	0.001	(0.043)	0.025	(0.035)	0.036	(0.084)	0.061	(0.055)	0.037	(0.036)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.305		0.363		0.375		0.355		0.337	
Panel (D)										
public mode of transport	-0.145***	(0.042)	-0.062	(0.047)	-0.067	(0.131)	-0.132*	(0.077)	-0.066*	(0.039)
active mode of transport	0.114***	(0.033)	0.177***	(0.036)	0.246***	(0.070)	0.081*	(0.046)	0.330***	(0.026)
weighted average enjoyment non-travel ep.	0.598***	(0.018)	0.594***	(0.018)	0.648***	(0.038)	0.577***	(0.028)	0.573***	(0.016)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.311		0.332		0.351		0.334		0.324	
Number of episodes	5,734		9,499		1,510		2,915		10,272	

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Regressions at the episode level and by travel category. Dependent variable is standardized (z-score rescaled). Regressions include additional episode controls: time duration (in log of minutes) and its square, presence of others during the activity, and an indicator for travel during a weekday. Demographic controls at the individual-level: age (and its square), employment status, education level (if secondary or university), gender, native, living in couple, household size, and number of children in the household of the respondent. Full set of estimates is reported in Table A.4 of Appendix. Regressions include region, month and year indicators. Robust standard errors in parentheses.

* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.

Appendix

Table A.1. Classification of Travel Activities

travel category	activities
paid work	to/from work
	to work from home
	to work from a place other than home
unpaid work	household care
	shopping
	services
	organizational work
	informal help of others
	voluntary, civic, and religious travel
	escorting an adult
	changing locality
personal care	personal business
	physical exercise
childcare	travel related to education
	escorting to/from education
	escorting a child other than education
leisure	walking and hiking
	biking, skiing, skating
	visiting friends/relatives
	other social activity
	entertainment and cultural activities
	hunting and fishing
	productive exercise
	gambling
	travel to holiday base
	day trip/just walk

Note: Travel activities from the UKTUS 2014-2015.

Table A.2. Descriptive Statistics of Socio-Demographics Characteristics

	Sample		2011 UK Census
	Mean	**Std. Dev.**	
age	43.90	17.56	39.5
male	0.47	0.50	0.49
secondary education	0.37	0.48	0.40
native	0.86	0.34	0.87
employed	0.67	0.47	0.72
living in couple	0.64	0.48	0.65
household size	2.94	1.38	2.3
number of children < 18	0.65	0.97	0.56
enjoyment in non-travel activities	5.47	0.81	-
weighted enjoyment in non-travel activities	5.50	0.81	-
Number of individuals	4,586		

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. UK Census data is taken from the Office for National Statistics; National Records of Scotland; Northern Ireland Statistics and Research Agency (2017).

Table A.3. RE Full Set of Estimates of Table 4, Panel (A)

	Paid Work	Unpaid work	Personal care	Childcare	Leisure
public mode of transport	-0.150***	-0.058	-0.047	-0.093	-0.036
	(0.046)	(0.054)	(0.141)	(0.080)	(0.043)
active mode of transport	0.087**	0.172***	0.209**	0.077	0.330***
	(0.039)	(0.040)	(0.082)	(0.051)	(0.029)
episode time (in log)	0.269	0.248*	-0.312	-0.272	-0.019
	(0.205)	(0.139)	(0.409)	(0.257)	(0.108)
episode time squared (in log)	-0.045	-0.038*	0.039	0.044	0.003
	(0.034)	(0.023)	(0.066)	(0.042)	(0.017)
alone	-0.071	-0.156***	-0.040	-0.167***	-0.171***
	(0.110)	(0.045)	(0.116)	(0.063)	(0.042)
with spouse	0.117	0.042	0.149	0.127*	0.065*
	(0.105)	(0.043)	(0.112)	(0.069)	(0.036)
with parents	-0.070	0.120	-0.232	0.182	0.028
	(0.160)	(0.093)	(0.146)	(0.129)	(0.064)
with child	-0.071	0.007	0.045	-0.027	0.009
	(0.109)	(0.049)	(0.124)	(0.059)	(0.044)
with other family member	-0.071	0.076	0.131	0.018	0.080**
	(0.100)	(0.046)	(0.121)	(0.046)	(0.038)
with non-family	0.067	0.204***	0.191*	0.166***	0.251***
	(0.108)	(0.044)	(0.111)	(0.055)	(0.033)
if travelling during weekday	-0.011	-0.009	-0.114	-0.052	-0.033
	(0.037)	(0.032)	(0.072)	(0.052)	(0.030)
age	-0.025***	-0.000	0.001	0.003	-0.001
	(0.010)	(0.006)	(0.015)	(0.013)	(0.006)
age squared	0.000***	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
if male	-0.127***	-0.107***	-0.064	-0.065	-0.085***
	(0.037)	(0.032)	(0.070)	(0.055)	(0.031)
if secondary	0.104**	0.128***	0.256***	0.085	0.131***
	(0.040)	(0.034)	(0.076)	(0.058)	(0.033)
if native	-0.239***	-0.269***	-0.234**	-0.290***	-0.226***
	(0.058)	(0.053)	(0.103)	(0.075)	(0.048)
if employed	-0.005	0.006	0.141	0.112*	0.106***
	(0.112)	(0.041)	(0.106)	(0.063)	(0.040)
if living in couple	-0.029	-0.043	0.005	0.146*	-0.007
	(0.047)	(0.042)	(0.093)	(0.082)	(0.042)
household size	0.022	-0.042**	-0.073**	-0.121***	-0.003
	(0.021)	(0.021)	(0.033)	(0.028)	(0.017)
number of children	0.038	0.039	0.102**	0.085**	0.016
	(0.028)	(0.026)	(0.052)	(0.035)	(0.025)
Constant	0.207	-0.248	0.682	0.974*	0.092
	(0.407)	(0.294)	(0.744)	(0.501)	(0.249)
Observations	5,734	9,499	1,510	2,915	10,272
R-squared	0.049	0.056	0.092	0.118	0.099

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Dependent variable is standardized (z-score rescaled). Regressions at the episode level and by travel category. Regressions include region, month, and year indicators. Robust standard errors in parentheses.

* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.

Table A.3 (Cont.). RE Full Set of Estimates of Table 4, Panel (B)

	Paid work	Unpaid work	Personal care	Childcare	Leisure
public mode of transport	-0.139***	-0.070	-0.058	-0.144*	-0.070*
	(0.042)	(0.046)	(0.129)	(0.076)	(0.039)
active mode of transport	0.116***	0.173***	0.244***	0.071	0.327***
	(0.034)	(0.036)	(0.070)	(0.046)	(0.026)
average enjoyment non-travel	0.601***	0.641***	0.681***	0.616***	0.595***
	(0.018)	(0.016)	(0.036)	(0.028)	(0.016)
episode time (in log)	0.331*	0.209	-0.448	-0.282	-0.050
	(0.187)	(0.133)	(0.391)	(0.265)	(0.101)
episode time squared (in log)	-0.057*	-0.034	0.059	0.043	0.006
	(0.031)	(0.022)	(0.064)	(0.044)	(0.016)
alone	-0.049	-0.158***	-0.038	-0.190***	-0.151***
	(0.096)	(0.039)	(0.106)	(0.060)	(0.038)
with spouse	0.128	-0.028	0.133	0.053	0.013
	(0.092)	(0.038)	(0.099)	(0.057)	(0.031)
with parents	-0.023	0.088	-0.190	0.178	0.011
	(0.128)	(0.077)	(0.158)	(0.123)	(0.055)
with child	-0.060	-0.022	-0.058	-0.023	0.001
	(0.097)	(0.044)	(0.113)	(0.053)	(0.037)
with other family member	-0.027	0.055	0.111	-0.044	0.045
	(0.086)	(0.041)	(0.114)	(0.043)	(0.033)
with non-family	0.066	0.162***	0.183*	0.115**	0.207***
	(0.094)	(0.038)	(0.105)	(0.051)	(0.030)
if travelling during weekday	0.010	-0.006	-0.037	-0.067	0.009
	(0.029)	(0.024)	(0.057)	(0.041)	(0.024)
age	-0.009	0.010**	0.014	0.022**	0.007
	(0.008)	(0.004)	(0.012)	(0.010)	(0.005)
age squared	0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
if male	-0.062**	-0.080***	-0.058	-0.080*	-0.064***
	(0.029)	(0.024)	(0.054)	(0.045)	(0.024)
if secondary	-0.034	0.019	0.164***	0.006	0.064**
	(0.032)	(0.026)	(0.062)	(0.045)	(0.025)
if native	-0.016	-0.054	-0.049	-0.028	-0.069*
	(0.045)	(0.041)	(0.081)	(0.058)	(0.038)
if employed	0.040	0.016	0.108	0.049	0.055*
	(0.094)	(0.031)	(0.080)	(0.049)	(0.032)
if living in couple	-0.001	-0.055*	-0.124	0.108*	-0.024
	(0.039)	(0.032)	(0.076)	(0.063)	(0.034)
household size	0.002	-0.029*	-0.059**	-0.056**	-0.008
	(0.017)	(0.016)	(0.029)	(0.023)	(0.014)
number of children	0.035	0.041**	0.104**	0.070**	0.018
	(0.022)	(0.020)	(0.043)	(0.027)	(0.020)
Constant	-3.606***	-4.079***	-3.197***	-2.944***	-3.359***
	(0.372)	(0.264)	(0.736)	(0.520)	(0.248)
Observations	5,734	9,499	1,510	2,915	10,272
R-squared	0.305	0.363	0.374	0.354	0.337

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Dependent variable is standardized (z-score rescaled). Regressions at the episode level and by travel category. Regressions include region, month, and year indicators. Robust standard errors in parentheses.

* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.

Table A.3 (Cont.). RE Full Set of Estimates of Table 4, Panel (C)

	Paid work	Unpaid work	Personal care	Childcare	Leisure
public mode of transport	-0.139***	-0.065	-0.052	-0.150**	-0.069*
	(0.042)	(0.046)	(0.129)	(0.076)	(0.039)
active mode of transport	0.115***	0.174***	0.245***	0.068	0.327***
	(0.034)	(0.036)	(0.070)	(0.046)	(0.026)
average enjoyment non-travel	0.593**	0.466*	0.427	0.195	0.334
	(0.302)	(0.250)	(0.594)	(0.388)	(0.251)
total time in non-travel (in log)	0.031	-0.072	-0.288	-0.373	-0.184
	(0.226)	(0.202)	(0.487)	(0.302)	(0.204)
average enjoyment * total time	0.001	0.025	0.036	0.061	0.037
	(0.043)	(0.035)	(0.084)	(0.055)	(0.036)
episode time (in log)	0.315*	0.191	-0.414	-0.268	-0.057
	(0.187)	(0.133)	(0.392)	(0.266)	(0.101)
episode time squared (in log)	-0.055*	-0.032	0.054	0.041	0.007
	(0.031)	(0.022)	(0.064)	(0.044)	(0.016)
alone	-0.050	-0.159***	-0.028	-0.191***	-0.153***
	(0.096)	(0.039)	(0.106)	(0.060)	(0.038)
with spouse	0.124	-0.028	0.133	0.052	0.012
	(0.092)	(0.038)	(0.099)	(0.057)	(0.031)
with parents	-0.024	0.090	-0.190	0.173	0.011
	(0.128)	(0.077)	(0.157)	(0.124)	(0.055)
with child	-0.060	-0.024	-0.065	-0.023	-0.002
	(0.097)	(0.044)	(0.113)	(0.053)	(0.037)
with other family member	-0.027	0.056	0.118	-0.044	0.045
	(0.086)	(0.041)	(0.114)	(0.043)	(0.033)
with non-family	0.064	0.162***	0.188*	0.115**	0.206***
	(0.094)	(0.038)	(0.106)	(0.051)	(0.030)
if travelling during weekday	0.011	-0.005	-0.039	-0.071*	0.010
	(0.029)	(0.024)	(0.057)	(0.041)	(0.024)
age	-0.009	0.010**	0.014	0.023**	0.007
	(0.008)	(0.004)	(0.012)	(0.010)	(0.005)
age squared	0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
if male	-0.062**	-0.080***	-0.060	-0.081*	-0.063**
	(0.029)	(0.024)	(0.054)	(0.045)	(0.024)
if secondary	-0.035	0.019	0.160***	0.006	0.065**
	(0.032)	(0.026)	(0.062)	(0.045)	(0.025)
if native	-0.016	-0.058	-0.052	-0.026	-0.070*
	(0.046)	(0.041)	(0.082)	(0.058)	(0.038)
if employed	0.035	0.015	0.108	0.052	0.055*
	(0.095)	(0.031)	(0.080)	(0.049)	(0.032)
if living in couple	-0.002	-0.056*	-0.112	0.115*	-0.025
	(0.039)	(0.032)	(0.077)	(0.063)	(0.034)
household size	0.003	-0.029*	-0.061**	-0.056**	-0.008
	(0.017)	(0.016)	(0.029)	(0.023)	(0.014)
number of children	0.035	0.041**	0.106**	0.072***	0.019
	(0.022)	(0.020)	(0.043)	(0.027)	(0.020)
Constant	-3.788**	-3.538**	-1.262	-0.399	-2.070
	(1.630)	(1.434)	(3.471)	(2.154)	(1.453)
Observations	5,734	9,499	1,510	2,915	10,272
R-squared	0.305	0.363	0.375	0.355	0.337

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Dependent variable is standardized (z-score rescaled). Regressions include region, month, and year indicators. Robust standard errors in parentheses.

* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.

Table A.3 (Cont.). RE Full Set of Estimates of Table 4, Panel (D)

	Paid work	Unpaid work	Personal care	Childcare	Leisure
public mode of transport	-0.145***	-0.062	-0.067	-0.132*	-0.066*
	(0.042)	(0.047)	(0.131)	(0.077)	(0.039)
active mode of transport	0.114***	0.177***	0.246***	0.081*	0.330***
	(0.033)	(0.036)	(0.070)	(0.046)	(0.026)
weighted average enjoyment non-travel	0.598***	0.594***	0.648***	0.577***	0.573***
	(0.018)	(0.018)	(0.038)	(0.028)	(0.016)
episode time (in log)	0.324*	0.223*	-0.470	-0.283	-0.028
	(0.181)	(0.133)	(0.392)	(0.266)	(0.101)
episode time squared (in log)	-0.055*	-0.036*	0.062	0.042	0.003
	(0.030)	(0.022)	(0.064)	(0.044)	(0.016)
alone	-0.047	-0.161***	-0.025	-0.180***	-0.145***
	(0.097)	(0.040)	(0.108)	(0.061)	(0.038)
with spouse	0.139	-0.027	0.134	0.079	0.012
	(0.093)	(0.039)	(0.102)	(0.058)	(0.032)
with parents	-0.021	0.091	-0.200	0.190	0.011
	(0.129)	(0.081)	(0.164)	(0.127)	(0.056)
with child	-0.061	-0.036	-0.051	-0.018	-0.007
	(0.098)	(0.045)	(0.115)	(0.055)	(0.038)
with other family member	-0.048	0.048	0.117	-0.047	0.046
	(0.087)	(0.042)	(0.115)	(0.043)	(0.033)
with non-family	0.067	0.159***	0.207*	0.130**	0.210***
	(0.094)	(0.039)	(0.107)	(0.052)	(0.030)
if travelling during weekday	0.019	-0.009	-0.037	-0.070	0.002
	(0.029)	(0.025)	(0.058)	(0.043)	(0.024)
age	-0.008	0.008*	0.010	0.017	0.005
	(0.008)	(0.005)	(0.012)	(0.010)	(0.005)
age squared	0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
if male	-0.043	-0.076***	-0.047	-0.071	-0.050**
	(0.029)	(0.025)	(0.056)	(0.046)	(0.025)
if secondary	-0.019	0.033	0.168***	0.023	0.074***
	(0.031)	(0.027)	(0.062)	(0.047)	(0.026)
if native	-0.036	-0.080*	-0.056	-0.069	-0.085**
	(0.046)	(0.043)	(0.083)	(0.060)	(0.039)
if employed	0.077	0.035	0.138*	0.096*	0.072**
	(0.096)	(0.032)	(0.081)	(0.049)	(0.032)
if living in couple	0.011	-0.060*	-0.120	0.114*	-0.030
	(0.039)	(0.033)	(0.078)	(0.064)	(0.034)
household size	0.007	-0.028*	-0.061**	-0.071***	-0.006
	(0.017)	(0.017)	(0.029)	(0.024)	(0.014)
number of children	0.030	0.038*	0.101**	0.071**	0.013
	(0.022)	(0.021)	(0.044)	(0.028)	(0.021)
Constant	-3.578***	-3.792***	-3.021***	-2.638***	-3.239***
	(0.365)	(0.278)	(0.745)	(0.524)	(0.250)
Observations	5,734	9,499	1,510	2,915	10,272
R-squared	0.311	0.332	0.351	0.334	0.324

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Dependent variable is standardized (z-score rescaled). Regressions at the episode level and by travel category. Regressions include region, month, and year indicators. Robust standard errors in parentheses.

* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.

Table A4. OLS Regression of the Level of Enjoyment by Travel Category

	Paid work		Unpaid work		Personal care		Childcare		Leisure	
Panel (A)										
public mode of transport	-0.252***	(0.059)	-0.220***	(0.069)	-0.198	(0.183)	-0.262*	(0.138)	-0.152***	(0.053)
active mode of transport	0.128**	(0.051)	0.151***	(0.043)	0.277***	(0.092)	0.183***	(0.065)	0.315***	(0.033)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.064		0.065		0.116		0.131		0.103	
Panel (B)										
public mode of transport	-0.187***	(0.049)	-0.173***	(0.052)	-0.132	(0.134)	-0.249**	(0.126)	-0.174***	(0.043)
active mode of transport	0.160***	(0.040)	0.165***	(0.034)	0.304***	(0.072)	0.121**	(0.052)	0.315***	(0.027)
average enjoyment non-travel ep.	0.604***	(0.020)	0.676***	(0.015)	0.692***	(0.035)	0.633***	(0.028)	0.609***	(0.017)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.305		0.366		0.378		0.357		0.334	
Panel (C)										
public mode of transport	-0.186***	(0.049)	-0.166***	(0.052)	-0.121	(0.135)	-0.258**	(0.126)	-0.172***	(0.043)
active mode of transport	0.159***	(0.040)	0.165***	(0.034)	0.304***	(0.072)	0.116**	(0.052)	0.314***	(0.027)
average enjoyment non-travel ep.	0.503	(0.398)	0.124	(0.302)	0.110	(0.662)	0.431	(0.410)	0.339	(0.316)
total time in non-travel episodes (in log)	-0.043	(0.287)	-0.363	(0.236)	-0.525	(0.540)	-0.216	(0.319)	-0.191	(0.257)
average enjoyment * total time non-travel	0.014	(0.056)	0.078*	(0.043)	0.083	(0.094)	0.030	(0.059)	0.039	(0.045)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.305		0.367		0.379		0.358		0.334	
Panel (D)										
public mode of transport	-0.201***	(0.049)	-0.170***	(0.054)	-0.146	(0.140)	-0.240**	(0.122)	-0.172***	(0.043)
active mode of transport	0.144***	(0.039)	0.165***	(0.035)	0.314***	(0.074)	0.129**	(0.053)	0.319***	(0.027)
weighted average enjoyment non-travel ep.	0.603***	(0.019)	0.640***	(0.016)	0.661***	(0.035)	0.602***	(0.029)	0.597***	(0.017)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
R-squared	0.312		0.335		0.357		0.341		0.323	
Number of episodes	5,734		9,499		1,510		2,915		10,272	

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Dependent variable is standardized (z-score rescaled). Regressions at the episode level and by travel category. Regressions include additional episode controls: time duration (in log of minutes) and its square, presence of others during the activity, and an indicator for travel during a weekday. Demographic controls at the individual-level: age (and its square), employment status, education level (if secondary or university), gender, native, living in couple, household size, and number of children in the household of the respondent. Full set of estimates is reported in Table A.3 of Appendix. Regressions include region, month, and year indicators. Robust standard errors clustered at the individual level in parentheses.

* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.

Table A.5. Robustness Check: Ordered Logit Regression of the Level of Enjoyment by Travel Category

	Paid work		Unpaid work		Personal care		Childcare		Leisure	
Panel (A)										
public mode of transport	-0.453***	(0.111)	-0.387***	(0.129)	-0.318	(0.355)	-0.497*	(0.275)	-0.250**	(0.102)
active mode of transport	0.220**	(0.096)	0.307***	(0.080)	0.541***	(0.189)	0.356***	(0.128)	0.638***	(0.067)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Panel (B)										
public mode of transport	-0.395***	(0.107)	-0.359***	(0.122)	-0.219	(0.301)	-0.562**	(0.286)	-0.306***	(0.095)
active mode of transport	0.341***	(0.086)	0.458***	(0.077)	0.720***	(0.183)	0.325***	(0.118)	0.789***	(0.064)
average enjoyment non-travel ep.	1.386***	(0.057)	1.621***	(0.044)	1.660***	(0.104)	1.554***	(0.081)	1.456***	(0.048)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Panel (C)										
public mode of transport	-0.395***	(0.108)	-0.349***	(0.122)	-0.194	(0.307)	-0.577**	(0.286)	-0.301***	(0.095)
active mode of transport	0.340***	(0.086)	0.459***	(0.077)	0.719***	(0.182)	0.317***	(0.118)	0.788***	(0.064)
average enjoyment non-travel ep.	1.282	(0.896)	0.165	(0.680)	0.196	(1.744)	1.199	(0.908)	1.053	(0.720)
total time in non-travel episodes (in log)	-0.008	(0.642)	-0.977*	(0.530)	-1.307	(1.433)	-0.377	(0.693)	-0.242	(0.574)
average enjoyment * total time non-travel	0.015	(0.126)	0.207**	(0.096)	0.208	(0.248)	0.052	(0.130)	0.058	(0.103)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Panel (D)										
public mode of transport	-0.417***	(0.106)	-0.328***	(0.123)	-0.240	(0.306)	-0.518*	(0.275)	-0.310***	(0.094)
active mode of transport	0.305***	(0.083)	0.448***	(0.077)	0.710***	(0.182)	0.340***	(0.119)	0.791***	(0.064)
weighted average enjoyment non-travelling ep.	1.392***	(0.055)	1.503***	(0.045)	1.566***	(0.103)	1.440***	(0.079)	1.406***	(0.047)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Number of episodes	5,734		9,499		1,510		2,915		10,272	

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Dependent variable is standardized (z-score rescaled). Regressions at the episode level and by travel category. Regressions include additional episode controls: time duration (in log of minutes) and its square, presence of others during the activity, and an indicator for travel during a weekday. Demographic controls at the individual-level: age (and its square), employment status, education level (if secondary or university), gender, native, living in couple, household size, and number of children in the household of the respondent. Full set of estimates available upon request. Regressions include region, month, and year indicators. Robust standard errors clustered at the individual level in parentheses.

* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.

Table A.6. Robustness Check: RE Ordered Logit Regression of the Level of Enjoyment by Travel Category

	Paid work		Unpaid work		Personal care		Childcare		Leisure	
Panel (A)										
public mode of transport	-0.393***	(0.127)	-0.102	(0.159)	0.022	(0.497)	-0.213	(0.236)	-0.393***	(0.127)
active mode of transport	0.218**	(0.111)	0.578***	(0.116)	0.786***	(0.302)	0.257*	(0.155)	0.218**	(0.111)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Panel (B)										
public mode of transport	-0.360***	(0.113)	-0.147	(0.140)	-0.009	(0.451)	-0.346	(0.223)	-0.119	(0.115)
active mode of transport	0.302***	(0.094)	0.588***	(0.104)	0.907***	(0.262)	0.263*	(0.140)	1.077***	(0.082)
average enjoyment non-travel ep.	1.745***	(0.070)	2.051***	(0.064)	2.429***	(0.182)	1.953***	(0.109)	1.917***	(0.061)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Panel (C)										
public mode of transport	-0.358***	(0.113)	-0.131	(0.140)	0.011	(0.452)	-0.361	(0.224)	-0.116	(0.115)
active mode of transport	0.299***	(0.094)	0.588***	(0.104)	0.909***	(0.261)	0.256*	(0.141)	1.077***	(0.082)
average enjoyment non-travel ep.	1.769*	(0.911)	1.312*	(0.789)	1.106	(2.097)	0.693	(1.245)	0.974	(0.806)
total time in non-travel episodes (in log)	0.141	(0.672)	-0.359	(0.627)	-1.320	(1.701)	-1.097	(0.955)	-0.673	(0.636)
average enjoyment * total time non-travel	-0.003	(0.129)	0.105	(0.112)	0.189	(0.299)	0.182	(0.178)	0.135	(0.115)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Panel (D)										
public mode of transport	-0.375***	(0.114)	-0.125	(0.141)	-0.042	(0.455)	-0.302	(0.226)	-0.108	(0.116)
active mode of transport	0.299***	(0.093)	0.598***	(0.105)	0.890***	(0.259)	0.296**	(0.143)	1.084***	(0.082)
weighted average enjoyment non-travel ep.	1.750***	(0.070)	1.893***	(0.066)	2.314***	(0.185)	1.817***	(0.109)	1.822***	(0.061)
episode-level and demographic controls	Yes		Yes		Yes		Yes		Yes	
Number of episodes	5,734		9,499		1,510		2,915		10,272	

Note: Sample consists of travel episodes of all individuals from the UKTUS 2014-2015. Dependent variable is the level of enjoyment experienced by individuals in each episode scaled from 1 ("not at all") to 7 ("very much"). Dependent variable is standardized (z-score rescaled). Regressions at the episode level and by travel category. Regressions include additional episode controls: time duration (in log of minutes) and its square, presence of others during the activity, and an indicator for travel during a weekday. Demographic controls at the individual-level: age (and its square), employment status, education level (if secondary or university), gender, native, living in couple, household size, and number of children in the household of the respondent. Full set of estimates available upon request. Regressions include region, month and year indicators. Robust standard errors in parentheses.
* Significant at the 90% level. ** Significant at the 95% level. *** Significant at the 99% level.