

# Feeling unpleasant in daily activities – Exploring the effects of travel and non-travel time use in Germany

## Submission for the 10th Symposium of the European Association for Research in Transportation

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### SHORT SUMMARY

In this study, we examine the association between unpleasant feeling of daily activities (travel, paid and unpaid work) and various diverse factors: i) personal socio-economic status; ii) travel time use behavior (travel behavior and travel multitasking) iii) non-travel time use behavior (primary and secondary activities). We used the German National Time Use Survey 2012/13 and adopted multilevel logistic analysis. The results revealed that travel behaviour (travel by train, commute distance) and travel time use (passive activities, ICT use, socialising, paid and unpaid work during travel) significantly explain the unpleasant feeling of travel activity. For paid work, factors such as socio economic (being labourer/civil servant, work in shift), primary time spent on paid work and multitasking during paid work had significant positive effect on unpleasant feeling of paid work. For unpaid work, factors such as female gender, travel behavior (travel by public bus, cycling, walking, maintenance trips), primary time spent on unpaid work and multitasking during unpaid work positively determine the unpleasant feeling. The interaction between gender and travel /non-travel time use has a significantly larger effect on men's unpleasant feeling on time use activities than women.

**Keywords:** Activity based modeling, Gender interaction, Non-travel time use, Satisfaction  
Travel behavior, Travel time use, Work-family life

### 1. INTRODUCTION

The general demands and strain arising from work and family could heighten individuals' level of satisfaction with time spent on daily activities. Given its repetitive character, satisfaction with the daily time use activities may have a significant influence on life satisfaction. Several studies have documented the significance of work-, individual-, and family related factors in predicting individuals' satisfaction with job, family and life (Jamian et al., 2020; Jung and O'Brien, 2019; Gibb et al., 2013; Fahr, 2011). Still, the potential effects of travel behavior and travel time use have received limited attention in work and family research.

In transport research, concerns about individuals' travel satisfaction are not recent. Apparently, studies focus more on the relationship between travel behavior and travel satisfaction (De Vos et al., 2019; Handy and Thigpen, 2019; Ettema et al., 2011). The effect of travel time use on travel satisfaction is hardly addressed by the literature. The time use during travel (also known as travel-based multitasking) is still a complicating factor. While the travel time provides the opportunity to use the time effectively, the quality of transport services can be a barrier

(Gripsrud and Hjorthol 2012). Depending on the context of travel (travel mode, travel time, trip use, travel multitasking) individuals can perceive either pleasant or unpleasant travel.

The job satisfaction has been extensively researched and it appears to be related to job characteristics such as socioeconomic status, job performance, productivity and commuting (Fahr, 2011). Regarding the effect of multitasking on job satisfaction, there are basically two strands of arguments emerged in the literature: on one hand, multitasking could enable to achieve the work-related goals and job efficiency, and further improve job satisfaction (Jamian et al., 2020), while on the other, multitasking at workplace (e.g., socializing with colleague, checking emails, telephone calls) may cause frequent interruptions and distraction, which affects the job satisfaction (Mark et al. 2005).

Contrary to the travel and job satisfaction, time use studies have neglected to focus on the dissatisfaction with unpaid work (i.e. maintenance and care works). Mattingly and Sayer (2006) found that increase in time spent on unpaid work have direct positive effect on feeling rushed due to juggling of various activities with in available time and this leave less time for relaxation. Also, Jung and O'Brien (2019) found that housework stress was associated with time pressure, perceived fairness of division of housework and multitasking.

Overall, it can be observed that time use studies on subjective feeling of travel, paid and unpaid work are scarce and partial due to the lack of knowledge on individuals' preference for their participation in activities. There is no sufficient evidence on the association between travel/ non-travel time use behaviour and the subjective feeling of time use. The gender dimension in time use activities has only recently become a focus of research on activity participation, with little attention to subjective feeling of satisfaction. To understand the relationship between work-family life and travel characteristics, there is a need to explore the effect of gendered travel (or non-travel) time use behaviour on feeling of dissatisfaction with time use activities. In this study, we address critical questions left unanswered in the literature: Do travel time use influence the unpleasant travel? How do gender travel and non-travel time use behaviour affects unpleasant paid and unpaid work? Do multitasking determine dissatisfaction with paid and unpaid work?

For our analysis, we expect that the increase in age negatively determines unpleasant feeling of travel and paid work, and female gender positively impact unpleasant feeling of unpaid work (H1). Regarding socioeconomic attributes, we expect the positive effect of job factors such as monthly income, being self-employed and working on men's unpleasant feeling with paid work and travel (H2). For travel characteristics, we hypothesize that increase in travel (travelling by public modes) positively affects the unpleasant feeling of travel, paid and unpaid work (H3). We expect travel time use (hearing music/ reading) negatively affects men's paid work or travel dissatisfaction, while socialising during travel negatively related to women's unpleasant travel (H4). Regarding the daily time use behavior, we expect that increase in time spent on primary paid/primary unpaid work and time pressure have a positive relationship, but the number of leisure episodes may be negatively associated with men's unpleasant feeling of time use (travel/paid/unpaid work (H5). Finally, we expect the increase in time spent on multitasking during paid work may positively affect the men's unpleasant feeling of paid work, whereas the increase in time spent on multitasking during unpaid work may positively affect women's unpleasant feeling of unpaid work (H6).

## **2. METHODOLOGY**

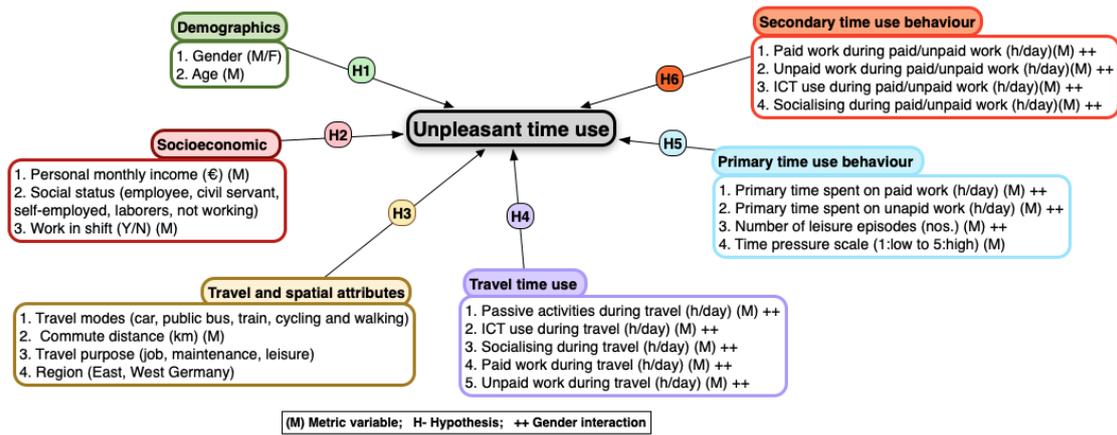
### ***Data***

For our study, we use the German Time Use Survey (GTUS) 2012/13 data (FDZ 2013). It comprises socioeconomic, demographic, and three-day activity, travel and mode-use patterns. In travel time diary, respondents from 4775 households self-reported their daily activities (primary and secondary) in time plan sheets for a continuous 24 hours (i.e. from 4:00 AM to 4:00 AM next day) over three random days (two weekdays and one weekend day), with ten-minute intervals.

**Sample and Variable sets**

Our sample comprises 5547 days (M:2287; W:3260) reported by 2130 respondents (M:885; W:1245). The outcome variable for the analysis is the individuals’ unpleasant feeling of time use (travel, paid work and unpaid work). For the sake of brevity, we have excluded the unpleasant feeling of leisure activity.

The explanatory variables are classified in five groups of variables (see **Figure 1**): (a) individual demographics, (b) socioeconomic, (c) travel and spatial attributes, (d) travel time use, and (e) non-travel time use behavior (primary and secondary). For travel and non-travel time use, we have included gender interactions to examine the gender effects on unpleasant feeling.



**Figure 1: Factors affecting the unpleasant feeling of time use activities**

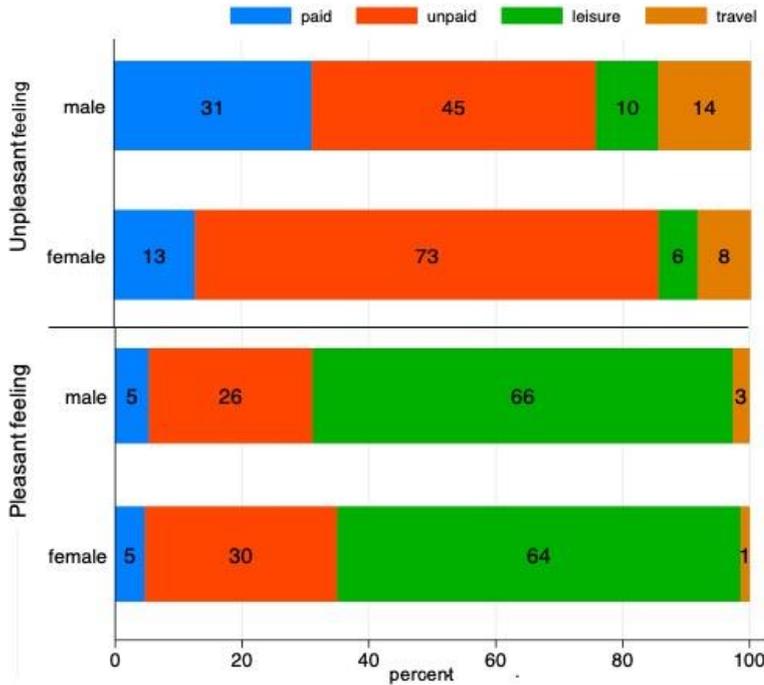
**Method**

We performed descriptive analysis to examine whether there are gender differences in the subjective feeling of time use activities using independent sample t-tests, paired sample t-tests and chi-square independence tests. For our analysis, we include three models: unpleasant travel (m1), unpleasant paid work (m2) and unpleasant unpaid work (m3) for the same sample.

Our sample structure allows for multilevel mixed logistic regression as days are nested within respondents (clusters). In our model, the fixed effects were measured by the coefficients, while the random part of the model was estimated by variance. The intra-cluster correlation coefficient (ICC) denotes the percentage of the variance that lies between level-2 units, i.e., within days per person in our study. The likelihood-ratio test comparing the mixed logistic regression model with ordinary logistic regression suggests that there is enough variability between respondents to favor a mixed effect. We checked for multicollinearity among independent variables using the variance inflation factor (VIF). We calculated the following statistics to assess the better fit model: statistics for all models (Akaike information criterion/ AIC and Bayesian information criterion /BIC).

### 3. RESULTS AND DISCUSSION

The stacked bar diagrams (**Figure 2**) compare men’s and women’s subjective feeling (pleasant and unpleasant) of daily time use across various activities (paid work, unpaid work, leisure and maintenance). Within the activities, men are more likely than women to feel unpleasant with paid work, leisure and travel activities, while women are more likely than men to feel unpleasant with unpaid work (e.g. errands, child/family care and shopping). Regarding pleasant feeling, men are more likely than women to feel pleasant with leisure activities. The share of pleasant feeling for travel and paid work remains negligible for both men and women. For this reason, we limit our analysis to unpleasant (and not the pleasant) feeling of time use activities.



**Figure 2: Respondent’s self reporting on subjective feeling of time use activities (N=5547)**

The regression results of three models (travel -m1, paid work-m2, unpaid work- m3) are provided in the coefplots (i.e., the graphs of point estimates) (see **Figure 3**, **Figure 4**, **Figure 5** respectively) to compare the coefficients from one model and across the models.

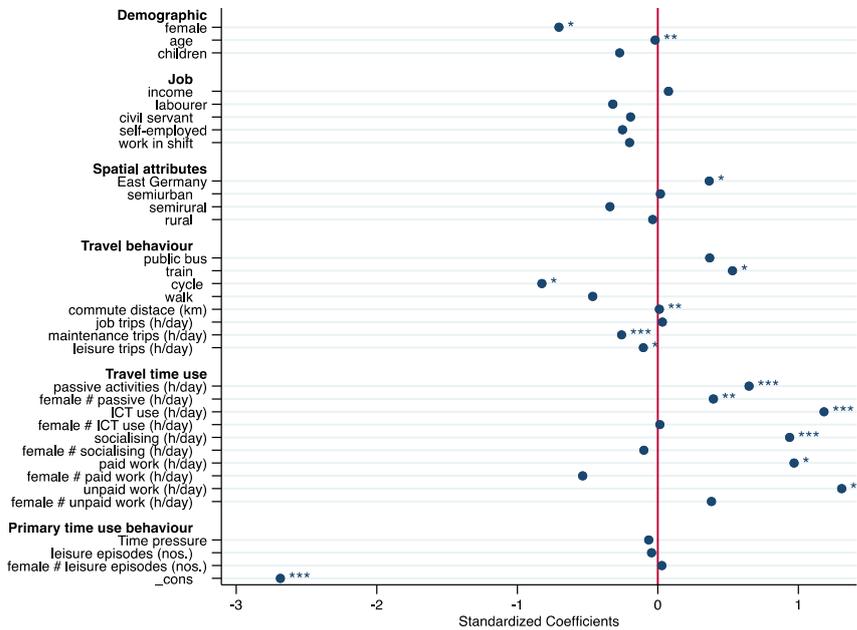
The model confirms the negative effect of female gender and age on unpleasant travel and paid work and the positive effect of female gender on the unpleasant feeling of unpaid work (in line with H1).

Social status (being labourer/ civil servant vs. salaried employee) and working in shift positively determines the unpleasant feeling of paid work (in line with H1), while working in shift is negatively associated with unpleasant feeling of unpaid work.

Compared to West Germany, living in East Germany has a positive (or negative) effect on the unpleasant feeling of travel (or paid work).

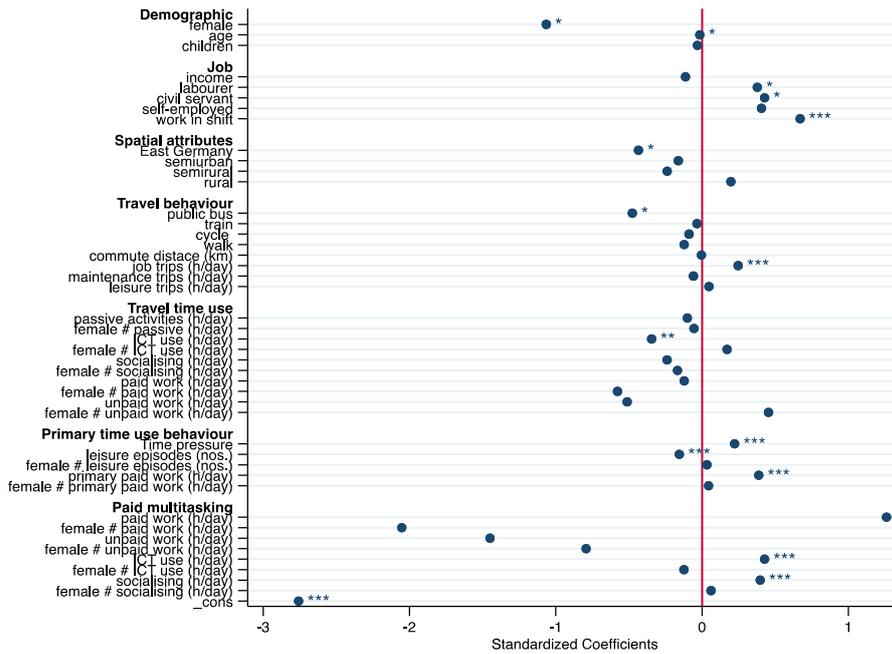
The travel attributes (traveling by train, commute distance, paid trips) have a positive relationship, but other travel factors (cycling, maintenance/ leisure trips) have a negative effect on unpleasant feeling of travel. Job trips have a positive effect, while travel by public bus negatively determines the unpleasant feeling of paid work. For unpaid work, travel modes

(public bus, cycling and walking) and maintenance trips have a significant positive association with unpleasant feeling.



**Figure 3: Model m1 - Regression results on unpleasant feeling of travel activity (N=5547)**

The travel time use significantly determines men’s unpleasant feeling of time use activities. The positive effect of men’s activities during travel (passive activities, ICT use, socializing, paid and unpaid work) on the unpleasant feeling of travel. For paid work, ICT use is negatively related to men’s unpleasant feeling travel dissatisfaction. For unpaid work, almost all activities during travel (passive, ICT use and socializing) are negatively related to men’s unpleasant feeling. For women, the effects of travel time use (except passive activities) remain insignificant for all three models.

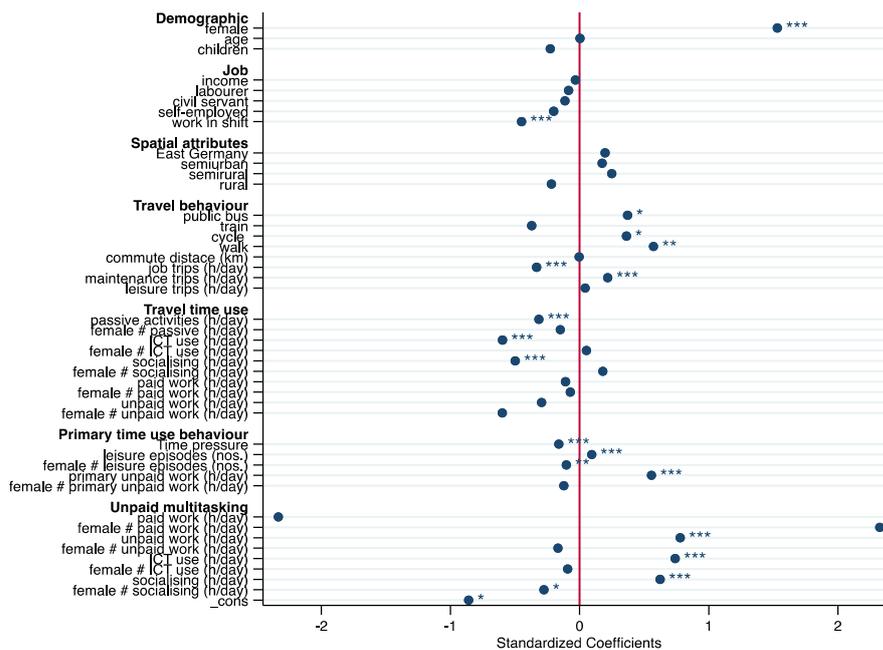


**Figure 4: Model m2 - Regression results on unpleasant feeling of paid work (N= 5547)**

For paid work, the primary time use behavior (time pressure, primary paid work) and secondary time use behavior (multitasking during paid work) positively determine men’s unpleasant feeling. The number of leisure episodes is negatively associated with men’s unpleasant feeling of paid work.

For unpaid work, the primary unpaid work and secondary time use behavior (multitasking during unpaid work) is positively associated, but the time pressure is negatively associated with men’s unpleasant feeling.

The gender effects reveal that number of leisure episodes and socializing during unpaid work has a negative effect on women’s unpleasant feeling of unpaid work.



**Figure 5: Model m3 - Regression results on unpleasant feeling of unpaid work (N=5547)**

#### 4. CONCLUSIONS

Using the cross-sectional time use diaries, GTUS, we explored the unpleasant feeling of time use activities such as travel, paid and unpaid work. The study contributes to the existing transport research by examining the association between travel time use and travel dissatisfaction. Also, we broaden the existing knowledge on job and family satisfaction by exploring the effects of travel behaviour, travel time use and multitasking on the unpleasant feeling of paid work and unpaid work. Based on the summary of findings, we draw five main conclusions.

First, the demographic measures suggest that young age and female gender are the important determinants of the unpleasant feeling of time use activities. The positive effect of job characteristics on unpleasant feeling with paid work suggests that working nonstandard hours, overtime work load, job stress (e.g. frontline health care workers), poor working conditions and low education level (e.g. nonacademic staff, blue-collar workers) could possibly influence the unpleasant feeling of paid work.

Second, the effect of regional difference on unpleasant travel suggests that longer travel duration and higher share of public transport in East Germany (compared to West), as pointed out by Kley (2016).

Third, the effect of travel behavior on unpleasant travel suggests that travel attributes (e.g. cycling, public bus, leisure trips) could possibly enhance the travel and job satisfaction, as pointed out by De Vos et al. (2019). Also, the positive effect of the job trips (or maintenance trips) on paid work (or unpaid work) dissatisfaction suggests that daily travel could be stressful, as pointed out by Clark et al., (2020). This could hint the transport planning authorities to develop sustainable travel patterns to juggle among homework, childcare and workplace.

Fourth, the positive association between travel time use activities (passive, ICT and socializing) and men's unpleasant feeling of time use activities (travel and unpaid work) suggest that travel

provides the opportunity for individuals to perform activities to cope up the time pressure that arises due to work, family or long travel duration. However, these findings must be interpreted with caution as the travel time use could possibly be the outcome of the unpleasant feeling of time use activities.

Finally, the handful evidence on the effect of gendered (non travel) time use behaviour on the unpleasant feeling of time use suggests men's dissatisfaction with paid work is mainly influenced by work hour and paid multitasking and their dissatisfaction with unpaid work is positively determined by the time spent on unpaid work and unpaid multitasking. Compared to men, women's feeling of dissatisfaction towards unpaid work decreases with the increase in socializing during unpaid work.

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