



Changes in residential satisfaction after relocation: The effects of commuting. A case study of luxembourg cross-border workers

Samuel Carpentier-Postel, Philippe Gerber, Emma Guyon, Olivier Klein

► To cite this version:

Samuel Carpentier-Postel, Philippe Gerber, Emma Guyon, Olivier Klein. Changes in residential satisfaction after relocation: The effects of commuting. A case study of luxembourg cross-border workers. Case Studies on Transport Policy, 2022, 10 (3), pp.1754-1766. 10.1016/j.cstp.2022.07.006 . hal-03741539

HAL Id: hal-03741539

<https://hal.science/hal-03741539>

Submitted on 20 Jan 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

CHANGES IN RESIDENTIAL SATISFACTION AFTER RELOCATION: THE EFFECTS OF COMMUTING. A CASE STUDY OF LUXEMBOURG CROSS-BORDER WORKERS

Samuel Carpentier-Postel¹, Philippe Gerber², Emma Guyon³ et Olivier Klein²

¹ ThéMA - Théoriser et modéliser pour aménager (UMR 6049), Université Bourgogne Franche-Comté

² LISER - Luxembourg Institute of Socio-Economic Research, Luxembourg

³ Université de Franche-Comté

This is a postprint version, the definitive version of this paper is :

Carpentier-Postel, S., Gerber, P., Guyon, E., & Klein, O. (2022). Changes in residential satisfaction after relocation : The effects of commuting. A case study of luxembourg cross-border workers. *Case Studies on Transport Policy*, 10(3), 1754-1766. <https://doi.org/10.1016/j.cstp.2022.07.006>

Changes in residential satisfaction after relocation: the effects of commuting. A case study of Luxembourg cross-border workers

Abstract: This article aims to unravel the determinants of changes in residential satisfaction after a relocation, and in particular the role of commuting conditions in such changes, for cross-border employees working in Luxembourg, a population characterised by a large proportion of long commutes and high car use. Based on a mobility survey (n=1,960) which provides information on socio-demographic status, travel behaviours, changes of residence, and perceived residential satisfaction, a multiple linear regression model of changes in residential satisfaction following a residential move is developed. The main results highlight that the worsening commuting conditions experienced by most respondents do not seem to reduce residential satisfaction. Indeed, even as commuting conditions deteriorate in the average case, residential satisfaction rises, especially for households that have moved from a flat to a house and from an urban to a rural area. In the context of the cross-border metropolitan area of Luxembourg, the difficulties in (long) commuting to work do not seem to be a limitation to this suburban model.

Keywords: residential satisfaction; daily mobility; cross-border; residential mobility; Luxembourg, France, Belgium, Germany

1. Introduction

Long commutes, which often favour the use of cars (Ewing & Cervero, 2001; Newman & Kenworthy, 1999), generate negative externalities from both an environmental perspective (e.g. pollution, noise) and a social perspective (e.g. segregation, road safety). For this reason, they are the subject of numerous studies that focus on mode choice and aim to identify drivers in view of a modal shift towards public transportation (Cairns et al., 2008). In the more specific case of cross-border regions like that of Luxembourg, the urban sprawl which leads to such long commutes may be fostered by differences in real estate prices between countries (Diop, 2012). This leads to a kind of cross-border spatial mismatch in which the country hosting the jobs has high real estate prices, while the bordering countries attract the labour force with more affordable prices and higher land availability. However, moving away from central work areas to cheaper accommodation in the suburbs often has negative consequences in terms of the resulting travel conditions: higher transport costs, longer travel times, etc. Besides the questions of housing costs, travel costs and travel times, the motivations that lead a relatively high number of households to adopt such cross-border suburban lifestyles, often resulting in car dependency, are complex and require a deepening of current knowledge. Against this background, this article aims to examine which factors could increase or decrease the residential satisfaction of cross-border households that have moved to cross-border areas outside of Luxembourg within the ten years prior to the survey, in order to measure the effect of commuting to work compared to the more standard factors identified in the scientific literature linked to socio-demographics and reasons for moving.

1.1. State of the art

The issue of the links between place of residence and mobility behaviours has been received broad and long-standing attention from researchers (Boarnet & Crane, 2001; De Vos, 2015; Handy, 1996;

Newman & Kenworthy, 1996). Several major results relevant for our own research should be noted here. The first is the revealing of a correlation between the type of place of residence, characterised in particular by density and functional mixing, and the mode of transport used. Low-density suburban and rural areas often disfavour the development of public transport modes, mainly because they are not sufficiently profitable, and thus encourage car dependency (Aguilera, 2005). Conversely, a second result from the literature shows that dense urban areas characterised by a functional mix will generate short travel distances that favour active modes and more efficient public transportation (Ewing & Cervero, 2010; Zhu et al., 2019). While this relationship is easily identifiable in aggregate data that group modal shares by location type, at the individual level the correlation between place of residence and modal choice is less clear. For instance, the question of residential self-selection (Ettema & Nieuwenhuis, 2017) arises at this level, insofar as individuals may choose to live in a particular type of location according to a travel preference (e.g. living in the city centre to be able to walk more than in the suburbs). In addition to the effects of transport networks and accessibility, there are thus individual factors that contribute to the alignment of daily mobility and residential choices. However, when confronted with an expensive housing market, as in the case of Luxembourg, residential choice remains limited and the importance given to mobility conditions is only one factor among others in the decision process.

From this point of view, it is therefore interesting to study the interactions of travel behaviours and residential moves more specifically. Recent research has explored different aspects of this complex relationship. From a geographic perspective, empirical investigations in the case of the state of Virginia in the United States (Shuai, 2012) have shown that the volume of home-work flows between two locations is positively correlated with residential migrations between these same locations. Under certain circumstances linked to the respective costs of transportation and housing, there may therefore be a kind of substitution of one type of mobility by another (Huber & Nowotny, 2013). Regarding the more specific question of mode choice and related attitudes, an analysis by De Vos et al. (De Vos et al., 2018), based on a survey on 1,539 individuals relocated in the city of Ghent in Belgium, confirmed that travel behaviours influence the choice of place of residence. This study also showed that mode choice and related attitudes may change after relocation, and that new habits can be established. This result is also supported by studies conducted in the German city of Stuttgart and in the cross-border urban area of Luxembourg (respectively Bamberg, 2016; Gerber et al., 2017). With regard to the issue of trade-offs and choices within households, a study about the travel behaviour and residential moves of two-earner households in Denmark has shown that their residential mobility tendencies are positively correlated with the cumulated commuting distances of both spouses, but negatively correlated with the distance between their respective workplaces (Deding et al., 2009). In a related finding, a survey conducted in the U.S. city of Seattle showed that two-worker households are more likely to reduce women's travel time rather than men's travel time in their relocation choices (Clark et al., 2003).

Finally, concerning the more specific question of residential satisfaction, which is at the core of our work, a study conducted in the Chinese city of Shanghai, comparing households that moved by choice and those that moved under constraint (Day & Cervero, 2010), showed that the level of perceived difficulties in terms of daily commuting is affected by the motivations for residential choice. It also highlighted the importance of income level on the stated level of satisfaction. Other determinants may also influence residential satisfaction. In addition to relatively expected

considerations such as housing quality or tenure status (Ren & Folmer, 2017), the residential move itself can also have a positive impact on residential satisfaction (Diaz-Serrano & Stoyanova, 2010). Regarding the role of daily mobility and commuting, which is addressed in this article, results from the British Household Panel Survey show that certain gender effects exist and that women are more sensitive to commuting time (Roberts et al., 2011). Studying the relation between commuting and subjective well-being more broadly based on data from the German Socio-Economic Panel, a recent study by Lorenz (2018) shows that commuting distance is not associated with lower life satisfaction.¹

These empirical results show the complexity of the relationships between daily and residential mobility. From this state of the art, we may note that numerous factors are in play when linking residential and daily mobility. When moving, people have to balance their residential expectations with geographic factors (e.g. type of municipality and related accessibility issues), household-related factors (e.g. spouse, income), as well as daily mobility constraints. To establish a robust approach which allows us to overcome (to a certain extent) the contingencies linked to specific case studies, our research is based on recent theoretical developments that are developed below.

1.2. Conceptual framework and research question

The theoretical framework of this research related to residential mobility and satisfaction (Figure 1) is based on a recent approach to the study of mobility known as mobility biographies (Lanzendorf, 2003; Scheiner, 2007). This theory is based on the observation of the routine dimension of a significant part of daily mobility behaviours (Gärling et al., 1998), involving strong behavioural inertia. As routines are made necessary by the need to reduce cognitive burden, changes in mobility behaviour then become difficult to achieve. The various changes in individuals' life cycles are then seen as events that are favourable to creating the conditions for behavioural change (Scheiner, 2014), insofar as they result in changes in lifestyle or context. The interest of the biographical approach is linked to the growing complexity of individual trajectories in the context of recent societal transformations: individualisation of lifestyles, evolution of family structures, increased work flexibility, etc. (Sheller & Urry, 2006).

The result is an increase in events that may lead to residential mobility and thus affect travel behaviours and related place attachment (Bailey et al., 2021). Analysis of the determinants of mobility behaviours thus need to consider life events related to the composition of the household (couple, childbirth, separation, death...), career paths (job search and change of employment, training) and to residential paths (parental de-cohabitation, home ownership, etc.) (Coulter et al., 2016; Scheiner & Holz-Rau, 2013). These different events have been identified in previous work as significant determinants of both residential and daily mobility behaviours (Carpentier, 2010). For example, a 2015 household survey in Britain indicated that the reasons for residential mobility are linked to job opportunities, housing area characteristics, and stage of life (Coulter & Scott, 2015).

In this context, the question of residential mobility and related residential satisfaction can be considered as an important indicator of quality of life and well-being (Dinç et al., 2014; Hamersma et al., 2014; Kroesen et al., 2010; Lu, 1999; Oishi & Tsang, 2022). Residential satisfaction has been defined as a process of alignment between household needs or aspirations and current place of

¹ For the case of Germany, however, older results (Stutzer & Frey, 2008) show a negative correlation between life satisfaction and commuting distance.

residence (Jansen, 2012). Two analytical approaches can be taken to tackle this theoretical issue. On the one hand, the pursuit of residential satisfaction may be considered as a primary reason for a residential move. This is particularly the case when residential mobility is viewed as a social elevator and an adjustment process, especially for workers reacting to changes in the job market (Clark & Maas, 2015). On the other hand, residential satisfaction may be viewed as a result of the difference in housing situation before and after a move (Barcus, 2004). Our research, which is grounded in the notions of life events and related residential mobilities, relies more particularly on this second approach, which also takes changes in commuting conditions into account. More precisely, while the impacts of residential relocation on travel conditions are studied relatively often, especially in the mobility biographies framework (Gerber et al., 2017; Wang et al., 2020), the same has not been true for the reverse effect (Wang & Wang, 2020).

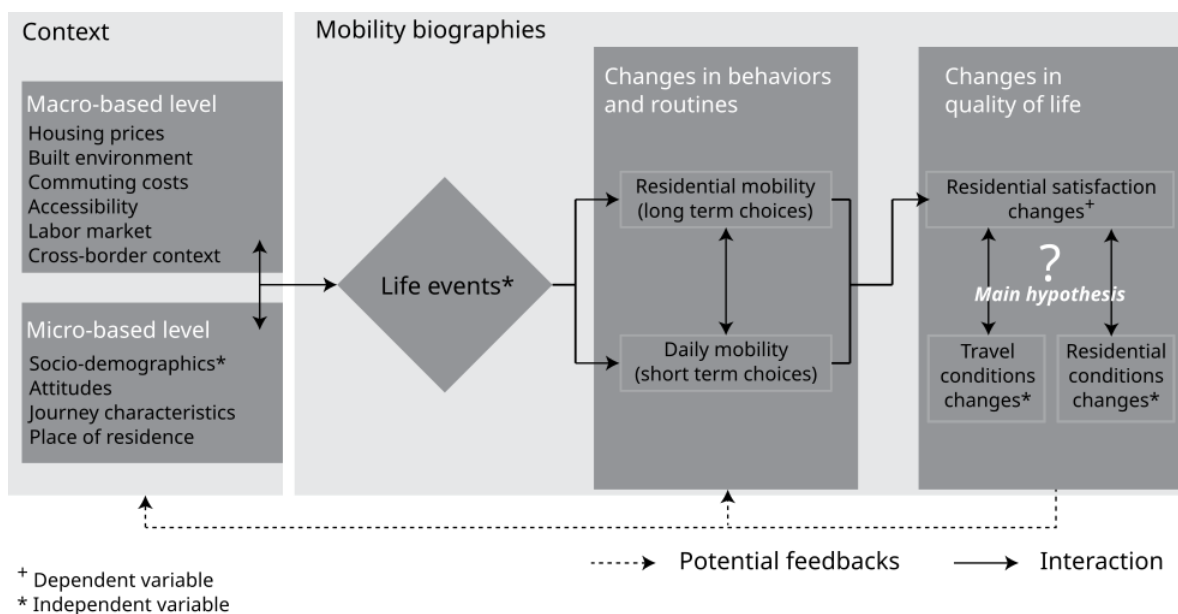


Fig. 1. Conceptual framework

Within this conceptual framework, this article studies changes in residential satisfaction after a move, which most often leads to a deterioration of commuting conditions, in the specific case of a cross-border metropolitan area. For the vast majority of cross-border workers living in a neighbouring country and working in Luxembourg, the residential move implies longer commuting distances and increased commuting dissatisfaction (Figure 4). In this context, does commuting affect changes in cross-border workers' residential satisfaction? Does the type of residential change (e.g. from apartment to house, from urban to rural municipality) have an impact on the overall changes in residential satisfaction whilst also accounting for commuting constraints? These questions lead to one main hypothesis: Changes in residential satisfaction after a move depend more on the new housing conditions than on the new commuting constraints. This hypothesis is in line with recent results observed in Luxembourg (Gerber et al., 2017), the Canadian city of Montreal (Zarabi et al., 2019), and Germany (Lorenz, 2018).

2. Materials and Methods

To answer these research questions, our empirical part is based on survey data that allow us to take account of the individual and contextual factors of our conceptual framework (e.g. socio-

demographics, life events, changes in travel conditions, changes in residential condition; see Figure 1) in order to model the determinants of changes in residential satisfaction.

2.1. Survey

Our analysis draws on a mobility survey conducted among cross-border workers employed in Luxembourg in 2010 and 2011 and living in France, Belgium or Germany. This dataset is based on a two-phase self-completed questionnaire sent to cross-border workers, with Phase 1 looking at the usual topics of a National Transport Survey, and Phase 2 focusing on respondents' perception of commuting, residential mobility, and their impact on daily mobility.

The scope of the survey covers 90% of the entire population of 146,600 cross-border workers (December 2009) within a commuting area allowing one round-trip journey to and from work per day (Drevon et al., 2018; Enaux & Gerber, 2014). Based on a spatially stratified random sampling process (Figure 2), 40,000 workers received the self-administered Phase 1 questionnaire. 7,235 respondents completed this first phase (18.1% of the target population). A second phase was conducted beginning in 2011. This second questionnaire had a response rate of 52% (9% of the initial target population of Phase 1), leading to a dataset of 3,727 individuals who responded to both phases of the survey.

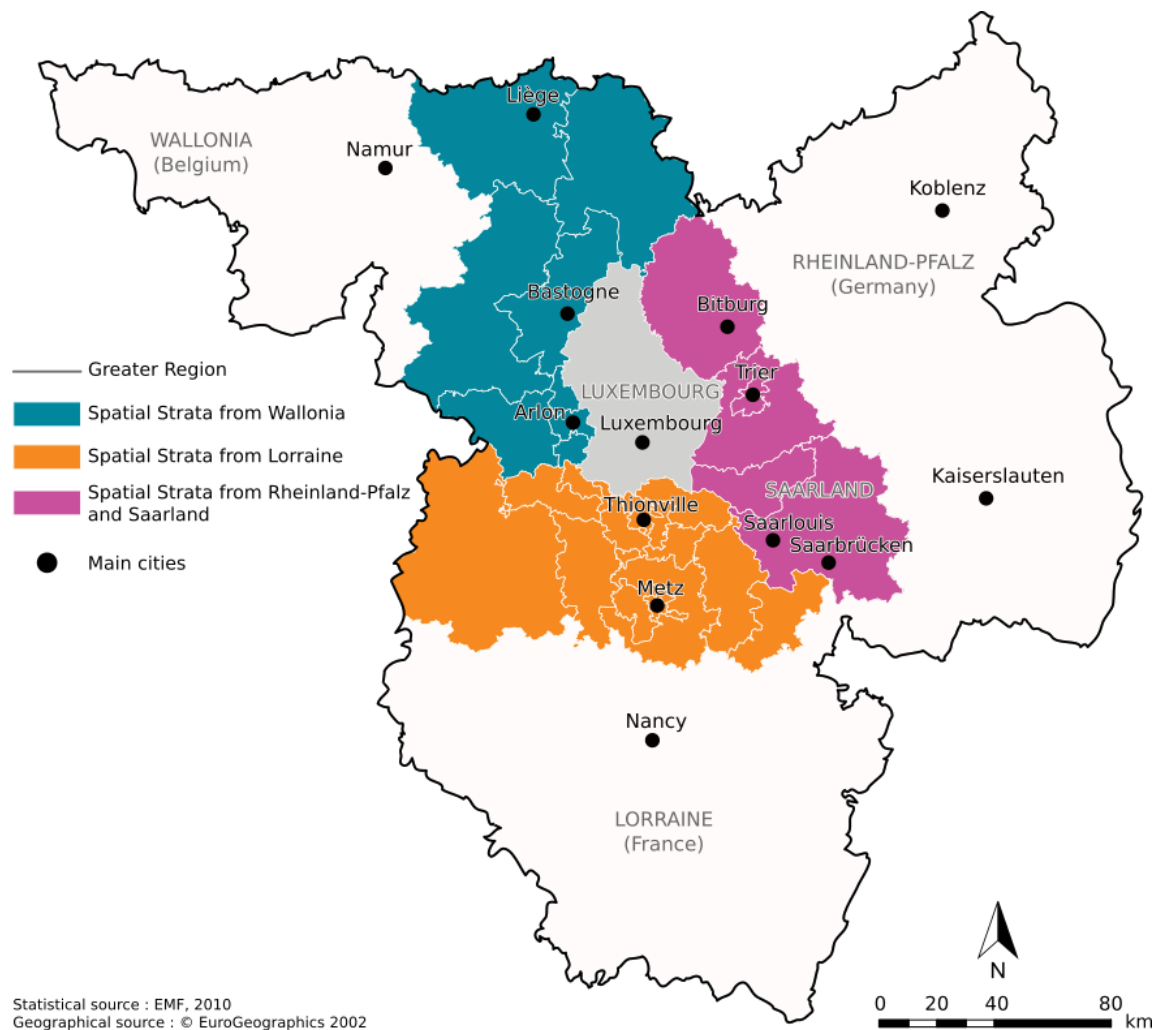


Fig. 2. Map of the study area and spatial strata of survey sampling

More specifically, the issue of changes in residential satisfaction has been addressed by gathering subjective indicators with several attitudinal scales related to residential transition, such as housing satisfaction before and after residential relocation (Figure 3). In this survey, only the difference in satisfaction before and after the move was collected, so we do not know the perceived levels of satisfaction for each situation.

D13 Compared to your previous place of residence, would you say that your current home, neighbourhood and environment are:

	Much worse than before	Worse than before	Identical	Better than before	Much better than before
Housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neighborhood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 3. Satisfaction scales for Housing, Neighbourhood and Environment

Assuming that residential satisfaction can be related to subjective and/or objective indicators (Haslauer et al., 2015), it is important to supplement the attitudinal scales with objective indicators. These supplementary indicators refer to environmental aspects at the macro-level, such as type of municipality or commuting distance (Vega & Reynolds-Feighan, 2009), and are also based on the mobility survey.

A final important aspect regarding data collection is the use of a cross-sectional survey to study changes in mobility and residential satisfaction after a move. This choice is motivated by the absence of a representative longitudinal panel survey of this cross-border population, but we must keep in mind that the data collected relies on respondents' memories (Müggenburg, 2021; Rau & Manton, 2016) and may be subject to imprecisions. That said, events as memorable as moving or as routinised as commuting are likely to still be well known by respondents.

2.2. Descriptive statistics of the sample

In this paper, the population studied is limited to cross-border workers employed in Luxembourg who have experienced a move in a period of 10 years prior to the survey, which restricts our sample to 1,960 individuals out of 3,727 (53%). After the relocation situation, this subsample is younger and less wealthy on average, and is more likely to live in flats and in urban municipalities (Figure A1) than the cross-border population as a whole.

For our sample, the main reasons to move in this cross-border context are related to the life cycle and housing conditions: Becoming a homeowner is the most commonly mentioned reason (over 51% of respondents), with other reasons relating to the living environment or type of housing. More than four-fifths of respondents report that they now have higher-quality accommodations (Figure A2), suggesting higher residential satisfaction: Over 80% of cross-border workers are satisfied, but this satisfaction is lower for households that have moved across a border (e.g. from Luxembourg to France).

With regard to their commutes, our sample experienced a clear deterioration in their travel conditions (Figure 4). On average, the distance for the trip to work increased by 5.4 kilometres (from 42.4 km to 47.8 km), and the travel time increased by 12 minutes (from 43 min. to 55 min.).

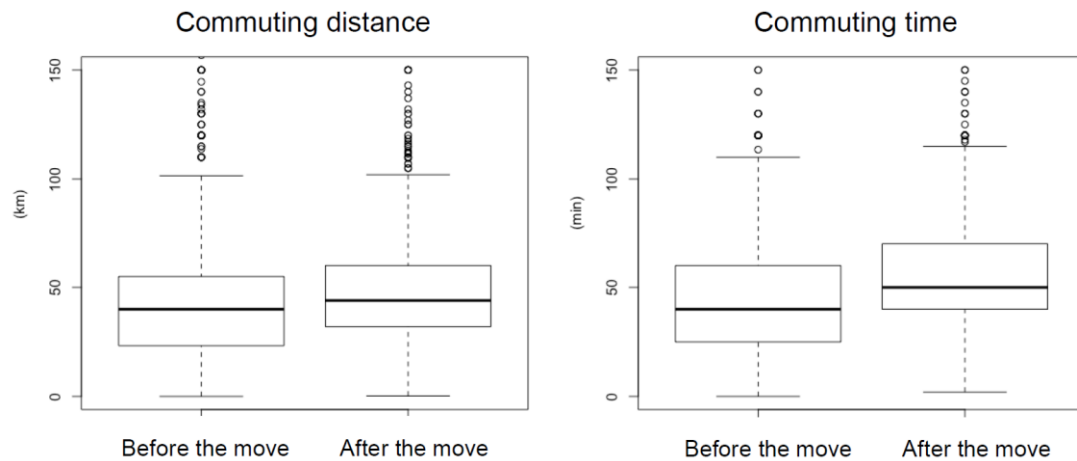


Fig. 4. Changes in commute distance and travel time before and after residential move

In addition, while 43% of respondents indicated that their commuting situation remained the same after the move, more than a quarter of respondents nevertheless reported that their situation had deteriorated significantly (Figure A3). This was especially true for people moving from Luxembourg to a neighbouring country (Table A3). We argue that even though a cross-border residential move is a specific type of relocation, it should be considered first and foremost as part of a suburbanisation process, supporting Alonso's (Alonso, 1964) theory. Cross-border workers, when able to choose, tend to seek out more space (for their house but also for their yard or garden) as well as more greenery and natural landscapes, while probably underestimating transportation constraints (Baudelle et al., 2004).

The next step in our methodology is to build a model based on our conceptual framework (Figure 1) and survey techniques that will allow us to determine the statistical relations between changes in residential satisfaction and commuting routines while taking account of the reasons for moving (life events) and the type of residential changes.

2.3. Methods

To analyse the determinants of changes in residential satisfaction among cross-border workers in Luxembourg who have moved in the ten years prior to the survey, the methodology we used consists of two main steps (Figure 5). Using the questionnaire data, the first step consists of an exploratory analysis of reported residential satisfaction, based on three attitudinal scales relating to housing, environment, and neighbourhood. A correlation analysis, complemented by a multiple correspondence analysis, is then performed to identify the appropriate method for calculating a synthetic indicator of changes in residential satisfaction that summarises the information from the different scales. The second step consists of using this synthetic indicator as the dependent variable in a regression model that considers the different categories of individual, transition and contextual determinants of our theoretical model (Figure 1). These include socio-demographic variables describing households that have recently moved, as well as variables describing changes in housing conditions, travel conditions, and life events motivating these changes.

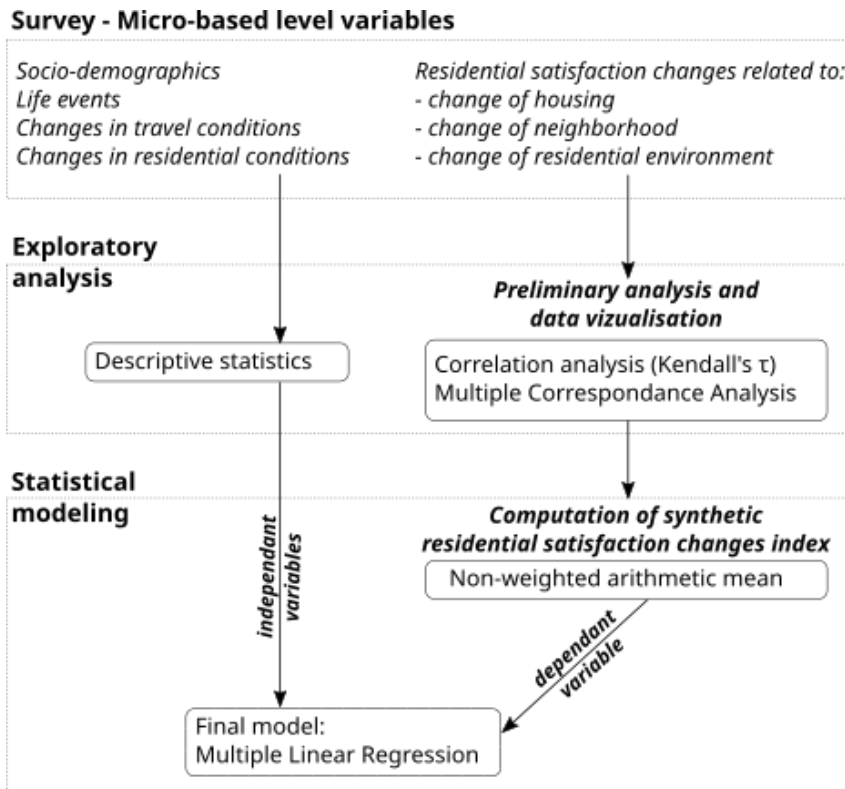


Fig. 5. Methodological framework

3. Results

As stated in the methodological framework, our analyses are divided into two complementary steps: First, we calculate and analyse a synthetic index of changes in residential satisfaction that will then be used as a dependent variable in a regression model aiming at explaining the level of satisfaction (all statistical analyses were performed using R).

3.1. Describing the residential satisfaction change index

The conceptual framework used in this article requires a global view of the notion of residential satisfaction. To achieve this perspective, we use the three attitude scales collected during the survey, which provide information on the satisfaction reported by individuals who have moved with regard to changes in their housing, environment, and neighbourhood (Figure 3). The first step of the analysis then consists of exploring the statistical relationships between these three dimensions of residential satisfaction in order to identify the appropriate procedure by which to combine them into a synthetic indicator.

Since the satisfaction scales used are ordinal qualitative variables, we calculated their correlations using Kendall's τ (Table 1). The correlation matrix shows that the three satisfaction scales are well correlated ($> 0.3^2$).

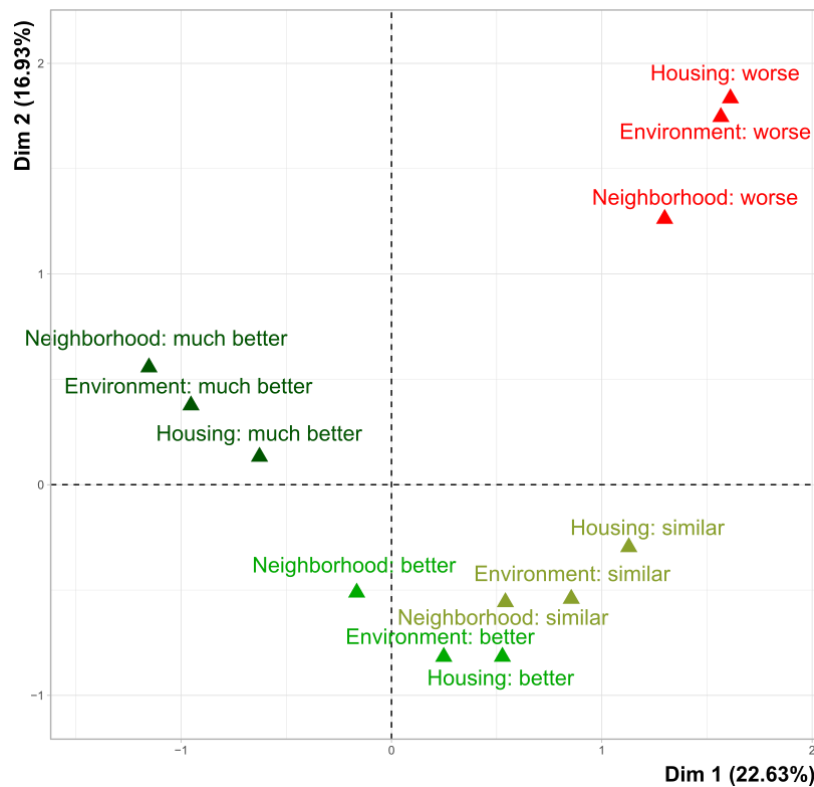
² <https://www.spss-tutorials.com/kendalls-tau/>

Table 1.Correlation matrix of satisfaction related to dimensions of quality of life (Kendall's τ)

	Housing	Neighbourhood	Environment
Housing	1	0.37	0.49
Neighbourhood	0.37	1	0.52
Environment	0.49	0.52	1

Source: LISER 2011, Cross-border mobility survey

A multiple correspondence analysis was performed to further analyse the relationships between the three scales. The factor map of the first two dimensions (Figure 6), accounting for about 40% of variance, shows a strong correspondence between the scores on the three scales. The positive evaluations are thus positioned in the same area of the factor map, as are the negative and average evaluations. In other words, there is a tendency for individuals to assess their satisfaction with housing, the environment and the neighbourhood at the same level. People will thus tend to accumulate elements of satisfaction or dissatisfaction according to their situation.

**Fig. 6.** Factor map of the Multiple Correspondence Analysis (MCA) of residential satisfaction

Based on the correlation analysis (Table 1) and the factor map of the three satisfaction scales relating to housing, environment and neighbourhood (Figure 6), we then opted to construct a synthetic non-weighted Residential Satisfaction Change Index corresponding to the arithmetic mean of the three scales (see Equation (1)).

$$RSCI = \frac{HSCS + ESCS + NSCS}{3} \quad (1)$$

where:

RSCI: Residential Satisfaction Change Index

HSCS: Housing Satisfaction Change Scale

ESCS: Environment Satisfaction Change Scale

NSCS: Neighbourhood Satisfaction Change Scale

This index is a pseudo-continuous variable and can thus be used as a continuous dependent variable of a multiple linear regression.

3.2. Modelling residential satisfaction

The statistical model of changes in residential satisfaction (Table 3) is constructed around the theoretical principles of mobility biographies described in the first section (Figure 1). On the one hand, the independent variable relies on the inclusion of different aspects of satisfaction, combined in the Residential Satisfaction Change Index. On the other hand, the independent variables belong to the four categories mentioned above: socio-demographic characteristics, changes in commuting conditions, changes in residential conditions, and life events (Table 2). The collinearity between variables was tested by computing the Variance Inflation Factor (presented in Table 3).

Table 2.

Descriptive statistics of the variables introduced in the model

DEPENDENT VARIABLE								
	Min	Q1	Median	Mean	Q3	Max	NA's	
RSCI	2.0	3.3	4.0	4.0	4.7	5.0	18	
INDEPENDENT VARIABLES								
Age group	(16,25]	(25,35]	(35,45]	(45,55]	(55,66]	NA's		
n (%)	76 (3.6%)	861 (41.2%)	850 (40.7%)	257 (12.3%)	45 (2.2%)	5		
Type of Household	Couple with children	Single without children		Couple without children		Single with children	NA's	
n (%)	1004 (47.9%)	446 (21.3%)		549 (26.2%)		95 (4.5%)		
Reported household income ³	less than €2,000	€2,001 to 2,500	€2,501 to 3,500	more than €3,500		NA's		
n (%)	543 (27.3%)	559 (28.1%)	606 (30.5%)	280 (14.1%)		106		
Reported changes in journey to work ⁴	No changes	Worse	Better	Much better		NA's		
n (%)	918 (44.2%)	627 (30.2%)	317 (15.3%)	216 (10.4%)		16		
Change in country of residence	Stay in France	Stay in Germany	Stay in Belgium	Move to another country in the Greater Region		NA's		
n (%)	995 (48.1%)	496 (24.0%)	386 (18.7%)	190 (9.2%)		27		
Changes in housing type	Flat to house	Flat to flat	House to flat	House to house	Other		NA's	
n (%)	770 (38.4%)	397 (19.8%)	174 (8.7%)	624 (31.1%)	39 (1.9%)		90	
Changes in type of municipality	Urban to rural	Urban to urban	Rural to rural (same type)	Rural to rural (different type)		Rural to urban	NA's	
n (%)	535 (26.8%)	594 (29.7%)	542 (27.1%)	168 (8.4%)		161 (8.1%)	94	
Reasons for moving	Home ownership	Housing type and size	Environmental neighbourhood	Move closer to familiar places	Family or financial problems	Household changes (childbirth...)	Professional and other reasons	NA's
n (%)	676 (33.3%)	337 (16.6%)	75 (3.7%)	79 (3.9%)	132 (6.5%)	250 (12.3%)	348 (17.1%)	63

Source: LISER 2011, Cross-border mobility survey

Socio-demographics are related to individual characteristics, such as age, household characteristics that capture social position (income) as well as characteristics related to spouses and children (type of household). For this category of variable, education level was found to be non-significant.

To measure the effects of changes in commuting conditions, the variables for distance and time changes (Figure 4) as well as mode choice before and after the move and reported satisfaction (Figure A3) were tested. When all four variables are introduced simultaneously in the model, only the last one is significant, and it was therefore the only one selected in the final version.

³ In the survey, the respondents were asked to sum up the net professional income of each person in the household, but also other monthly income such as family/unemployment allowances, pensions, bonuses, income from property, commercial benefits, etc.

⁴ This variable is based on the answers to the following question: "Compared to your previous place of residence, would you say that your current journey to work is: Much worse than before, Worse than before, Identical, Better than before, Much better than before"

284 To capture the effect of changes in residential conditions, three complementary variables were
285 introduced into the model: (i) change in housing type (Table A1), (ii) change in type of municipality
286 (Table A2), and (iii) change in country of residence (Table A3), allowing the model to take account
287 of the cross-border context.

288 The last category of dependent variables are dummies that correspond to the life events
289 conceptualised in the mobility biographies and reflect the primary motivations leading to the
290 residential move.

Table 3.

Multiple linear regression of the Residential Satisfaction Change Index (RSCI)

	Variable	Estimate		Std. Error	T value	Pr(> t)
	(Intercept)	4.356	***	0.063	68.345	< 2e-16
Socio-demographics	(a) Age group (VIF: 1.4)					
	Age group 26-35 (ref.)					
	Age group 16-25	0.159	*	0.094	1.685	0.092092
	Age group 36-45	0.026		0.039	0.656	0.511605
	Age group 46-55	-0.013		0.058	-0.234	0.814789
	Age group 56-66	-0.082		0.118	-0.699	0.484763
	(b) Type of household (VIF: 1.7)					
	Couple with children (ref.)					
	Single without children	-0.034		0.052	-0.663	0.507408
	Couple without children	-0.093	**	0.045	-2.062	0.039330
	Single with children	-0.157	*	0.085	-1.834	0.066784
	(c) Reported household income (in €) (VIF: 1.3)					
	Income group less than 2,000 (ref.)					
	Income group 2,001 to 2,500	0.106	**	0.049	2.164	0.030624
	Income group 2,501 to 3,500	0.092	*	0.048	1.922	0.054719
	Income group more than 3,500	0.226	***	0.059	3.812	0.000143
Changes in travel conditions	(d) Reported changes in the journey to work (VIF: 1.3)					
	No changes (ref.)					
	Worse	0.020		0.042	0.474	0.635886
	Better	0.067		0.052	1.287	0.198426
	Much better	0.231	***	0.062	3.731	0.000197
Changes in residential conditions	(e) Change in country of residence (VIF: 1.5)					
	Stay in France (ref.)					
	Stay in Germany	-0.132	***	0.045	-2.900	0.003780
	Stay in Belgium	0.060		0.048	1.255	0.209737
	Move to another country in the Greater Region	0.021		0.064	0.326	0.744700
	(f) Change in housing type (VIF: 2.0)					
	Flat to house (ref.)					
	Flat to flat	-0.233	***	0.053	-4.345	1.48e-05
	House to flat	-0.846	***	0.074	-11.385	< 2e-16
	House to house	-0.215	***	0.044	-4.803	1.71e-06
	Other	-0.319	**	0.129	-2.460	0.013981
	(g) Changes in type of municipality (VIF: 1;6)					
	Urban to rural (ref.)					
	Urban to urban	-0.160	***	0.049	-3.240	0.001219
	Rural to rural (same type)	-0.128	***	0.049	-2.625	0.008753
	Rural to rural (different type)	-0.015		0.068	-0.227	0.820297
	Rural to urban	-0.322	***	0.072	-4.473	8.26e-06
Life events	(h) Reasons for moving (VIF: 1.6)					
	Home ownership (ref.)					
	Type and size of housing	0.012		0.050	0.258	0.796170
	Environment and neighbourhood	0.242	***	0.090	2.663	0.007828
	Move closer to familiar places	-0.170	*	0.089	-1.902	0.057390
	Family or financial problems	-0.548	***	0.077	-7.119	1.63e-12
	Household changes (childbirth...)	-0.470	***	0.056	-8.295	2.26e-16
	Professional and other reasons	-0.337	***	0.052	-6.407	1.94e-10
	Adjusted R ² : 0.27, Signif. codes: 0.01 '***', 0.05 '**', 0.1 '*', Residual standard error: 0.689					

Source: LISER 2011, Cross-border mobility survey

The model provides insights into the determinants of changes in residential satisfaction among cross-border commuters who have changed their place of residence in the ten years prior to the survey. Regarding the first category of explanatory variable, i.e. socio-demographics, the most significant determinant is household composition (b). Couples without children and single-parent families are, on average, less satisfied with their move than families with children. From a socio-economic point of view, quite logically, we observe a satisfaction gradient that increases with income (c). This reflects the greater ease with which wealthy households find housing that meets their expectations. Age groups (a) do not significantly influence the changes in residential satisfaction, except for the youngest group (from 16 to 25) who tend to be a little more satisfied than those between 26 and 35 years old.

Besides these individual determinants, the large group of variables describing the changes in residential conditions is particularly significant. Households moving from a flat to a house (f) are the most satisfied, while those experiencing the opposite transition, from a house to a flat, are the least satisfied. However, moving from a house to another house is a less satisfying transition than moving from a flat to a house. Similarly, individuals who have moved from an urban to a rural municipality (g) are more satisfied than others, particularly those who have made the opposite transition, moving from a rural area to a city. The variation in satisfaction according to the country of residence (e) is quite weak, with only a slight decrease for households that stay in Germany.

Regarding the impact of changes in travel conditions, while we have previously observed that commuting (d) is not a major determinant of cross-border residential choice (since a small share of our sample chose to get closer to their workplace), from a satisfaction point of view, a clear improvement in travel conditions tends to improve residential satisfaction. This result only concerns a small proportion of the sample who reported better conditions for their commute after the move. For the vast majority of the others, this aspect is not significant and thus indicates the priority given to housing and environmental characteristics over transportation in their residential choice. We must point out here that the other variables describing changes in the commute (distance, time, modes) were also not significant (and therefore not included in the final model). This seems to demonstrate a decoupling of the changes in residential satisfaction and commuting conditions, despite a tendency to move further away which leads to worsening travel conditions

Finally, considering the dimension of life events, the reasons leading to a move (h) are a group of variables that are highly significant in the model. Those who moved to improve their housing and residential environment are, as expected, the most satisfied. Conversely, those who had to change their residence because of exogenous factors (financial difficulties, professional reasons, change in household composition) are less satisfied.

4. Discussion

The residential mobility of cross-border workers in Luxembourg highlights the strong attractiveness of single-family houses and low-density areas, despite the longer commuting distances. Moreover, the fact that the variables (tested but not retained in the model) of distance and travel time do not statistically affect changes in residential satisfaction is a result in itself. Specifically, we see that whether a move takes the household closer to or further away from the workplace does not affect the quality of the change in satisfaction, all else being equal.

These residential choices are notably in line with the home ownership trajectories of young households with children. Overall, there is a strong correspondence in this specific case study between motivations for a move and residential satisfaction. Households which moved to improve their housing conditions are, as expected, the most satisfied, while those who moved for other reasons, personal or professional, are less satisfied, as also observed by Day and Cervero (2010).

However, there is some variation when it comes to the observed transitions in housing types. First, the role played by the daily commute in such residential choice is particularly interesting. Indeed, while the average long commuting distance could be seen as a consequence of relatively modest income which requires households to move away to find cheaper housing, the analysis of satisfaction reveals that it is mostly the consequence of a preference for low-density areas. Hence, this research has shown how a higher residential satisfaction can be achieved despite difficult travel conditions which are recognised as such by individuals (Gerber et al., 2017). The notions of arbitration, or even balance, which underpin many static or dynamic economic models may then be reconsidered in the light of these results, especially in Land Use Transport Interaction (LUTI) models (Gerber et al., 2018; Simmonds et al., 2013).

For some people, there may be a hierarchy of different life choices within which housing seems to be a high priority, which might have an influence on satisfaction with different life domains (Nowok et al., 2018; Oh, 2020; Zarabi et al., 2019). From this perspective, it appears that the commute to work and the associated modal choice are not, in this case, choices in themselves. However, any such result will have to be confirmed by further analysis. The choice of housing, as well as neighbourhood, is then considered a priority choice in the hierarchy of lifestyle choices for cross-border workers. This hierarchy is perhaps dictated by a hierarchy of activity times, where commuting time, even if long, remains less important than the time spent at home enjoying one's garden in the sun with one's children playing on the swing. This is especially true since the time spent commuting can also be spent on other activities, such as resting, listening to music or working (Gerber et al., 2020). This fact may be reinforced following the Covid pandemic, during which remote work arrangements have strongly increased both for Luxembourg residents and for cross-border commuters (Martin et al., 2022). It gives residences (and more particularly, those located in suburban areas benefiting from large outdoor spaces) an undeniable comparative advantage.

In light of the above, land use and housing policies should be more closely linked to transportation policies in order to facilitate sustainable mobility, especially in the context of cross-border areas. Concretely, certain INTERREG projects have been set up to promote the emergence of cross-border regions, with certain degrees of functional integration (Drevon et al., 2018). For example, some regions try to ensure greater fluidity of cross-border flows through the use of shared cross-border spatial planning tools, for instance with the SDTGR project, a Territorial Development Plan for the Greater Region shared by all the actors in the Greater Region. Even though this project brings together institutional actors from several countries, competition still exists between the regions. The actors embedded in these INTERREG projects behave paradoxically, each giving priority to their own national area despite the cross-border cooperation (Decoville & Durand, 2021). The stakeholders still need to improve the balance between economic pressure, transport and housing markets (Causa & Pichelmann, 2020).

Finally, regarding the sociocultural dimension of such cross-border areas, the variation of changes in residential satisfaction according to country of residence appear to be quite weak. There is only a

slight decrease in reported satisfaction for households moving to Germany that may reflect the relatively high proportion of Luxembourgers in this group, who can thus be assumed to have decided to leave their home country to find a larger dwelling across the border, due to the cross-border real estate price differential (Carpentier, 2010). This leads us to confirm Luxembourg as an integrated cross-border metropolis (Sohn et al., 2009) from which cross-border workers can benefit as a catchment area (Gerber, 2012).

5. Conclusion

Previous studies (Gerber et al., 2017; Gerber & Carpentier, 2013) show that mobility behaviours are the result of choices relating to other spheres of daily life – including, but not limited to, the place of residence. This suggests a need for a cross-sectional analysis of the different dimensions of daily life, as suggested by the mobility biographies framework. In addition, through the use of a travel survey drawing on the concept of mobility biographies, we are able to show that the quality of travel conditions does not necessarily lead to changes in residential satisfaction, *ceteris paribus*. This also constitutes an argument for longitudinal surveys allowing researchers to link life events to mobility behaviours and possible changes in those behaviours (Müggenburg et al., 2015; Schoenduwe et al., 2015). Given that the evolution of contemporary lifestyles and related behavioural changes are at the core of discussions on sustainable development, particularly in terms of mobility, such a dynamic and systemic approach seems necessary at this point. This raises several methodological challenges, as the implementation of biographical and panel surveys remains long and costly. For example, the use of a cross-sectional survey directly addressing changes in satisfaction is probably less accurate than calculating changes in satisfaction based on knowledge of two successive residential locations, which also allows for control of satisfaction levels before and after the move.

Moreover, the results show the need to more carefully consider the question of residential choices and mobility biographies in integrated planning policies that coordinate housing and transport, in order to limit residential trajectories that move away from employment centres (Scheiner & Rau, 2020). More specifically, we should also emphasise the difficulties associated with cross-border governance. The stakeholders involved in these issues still need to improve on this dimension with regard to housing markets and public transport. Indeed, in order to avoid the development of long-distance commuting, fiscal, legal and economic measures must be taken in order to (i) facilitate the integration of newcomers, such as migrants or cross-border workers (here becoming residents in Luxembourg), and (ii) improve the efficiency of public transport accessibility (i.e. through a better integration of cross-border development policies), among other objectives.

Appendix A – Survey descriptive statistics

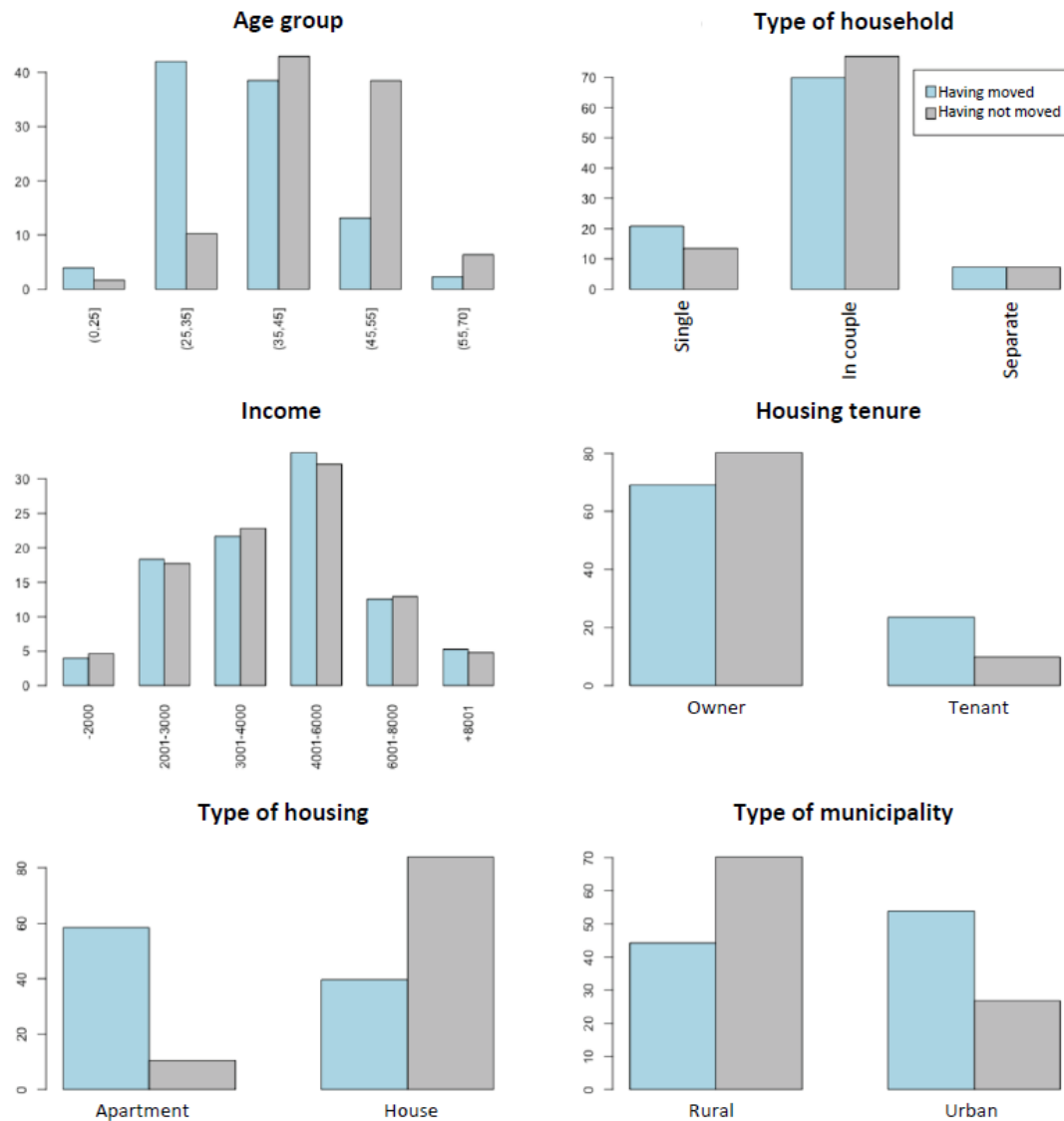


Fig. A1. Comparison of cross-border workers who did vs. did not move

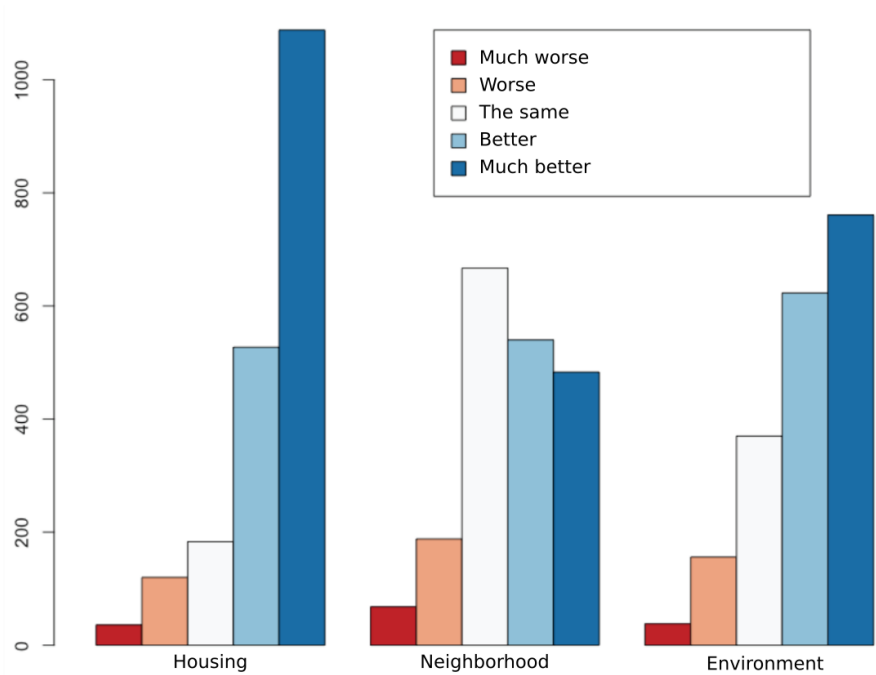


Fig. A2. Changes in residential satisfaction after moving

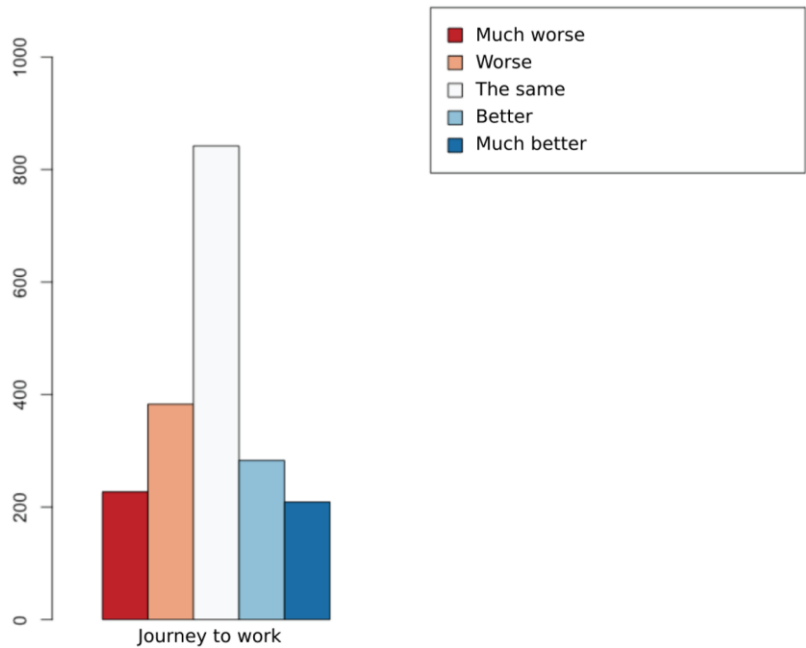


Fig. A3. Commuting satisfaction after moving

Table A1

Origin/destination matrix of changes in housing type

O/D	Detached house	Semi-detached house	Flat	Other	Total
Detached house	271	60	111	7	449
Semi-detached house	150	102	49	0	301
Flat	474	238	383	10	1105
Other	6	7	5	4	22
Total	901	407	548	21	1877

Source: LISER 2011, Cross-border mobility survey

Table A2.

Origin/destination matrix of changes in municipality type

O/D	Hamlet	Village	Market village	City	Big city	Total
Hamlet	3	18	1	9	1	32
Village	63	496	42	118	17	736
Market village	4	40	12	12	4	72
City	35	340	58	363	51	847
Big city	6	48	7	52	66	179
Total	111	942	120	554	139	1866

Source: LISER 2011, Cross-border mobility survey

Table A3.

Origin/destination matrix of changes in country of residence

O/D	France	Germany	Belgium	Total
France	861	6	13	880
Germany	2	496	1	499
Belgium	11	0	386	397
Luxembourg	57	52	48	157
Total	931	554	448	1933

Source: LISER 2011, Cross-border mobility survey

Table A4.

Descriptive statistics of the variables introduced in the model

Dependent variable	Min	Q1	Median	Mean	Q3	Max	NA's	
RSCI		2.0	3.3	4.0	4.0	4.7	5.0	18
Independent variables								
Age	(16,25]	(25,35]	(35,45]	(45,55]	(55,66]			
n	76	861	850	257	45	5		
%	3.6	41.2	40.7	12.3	2.2			
Type of Household	Couple with children	Single without children	Couple without children	Single with children				
n	1004	446	549	95				
%	47.9	21.3	26.2	4.5				
Income	less than €2,000	€2,001 to 2,500	€2,501 to 3,500	more than €3,500				
n	543	559	606	280	106			
%	27.3	28.1	30.5	14.1				
Changes in the journey to work	No changes	Worse	Better	Much better				
n	918	627	317	216	16			
%	44.2	30.2	15.3	10.4				
Change in country of residence	Stay in France	Stay in Germany	Stay in Belgium	Move to another country in the Greater Region				
n	995	496	386	190	27			
%	48.1	24.0	18.7	9.2				
Changes in housing type	Flat to house	Flat to flat	House to flat	House to house	Other			
n	770	397	174	624	39	90		
%	38.4	19.8	8.7	31.1	1.9			
Changes in type of municipality	Urban to rural	Urban to urban	Rural to rural (same type)	Rural to rural (different type)	Rural to urban			
n	535	594	542	168	161	94		
%	26.8	29.7	27.1	8.4	8.1			
Reasons for moving	Home ownership	Type and size of housing	Environment and neighbourhood	Move closer to familiar places	Family or financial problems	Household changes (childbirth...)	Professional and other reasons	
n	676	337	75	79	132	250	348	63
%	33.3	16.6	3.7	3.9	6.5	12.3	17.1	

Source: LISER 2011, Cross-border mobility survey

References

- Aguilera, A. (2005). Growth in Commuting Distances in French Polycentric Metropolitan Areas: Paris, Lyon and Marseille. *Urban Studies*, 42(9), 1537–1547. JSTOR.
- Alonso, W. (1964). *Location and Land Use. Toward a Genral Theory of Land Rent*. Harvard University Press.
- Bailey, E., Devine-Wright, P., & Batel, S. (2021). Emplacing linked lives: A qualitative approach to understanding the co-evolution of residential mobility and place attachment formation over time. *Journal of Community & Applied Social Psychology*, 31(5), 515–529. <https://doi.org/10.1002/casp.2533>
- Bamberg, S. (2016). Is a Residential Relocation a Good Opportunity to Change People's Travel Behavior? Results From a Theory-Driven Intervention Study: *Environment and Behavior*. <https://doi.org/10.1177/0013916505285091>
- Barcus, H. (2004). Urban-Rural Migration in the USA: An Analysis of Residential Satisfaction. *Regional Studies*, 38(6), 643–657. <https://doi.org/10.1080/003434042000240950>
- Baudelle, G., Darris, G., Ollivro, J., & Pihan, J. (2004). Les conséquences d'un choix résidentiel périurbain sur la mobilité: Pratiques et représentations des ménages. *Cybergeo : European Journal of Geography*. <https://doi.org/10.4000/cybergeo.3430>
- Boarnet, M., & Crane, R. (2001). The influence of land use on travel behavior: Specification and estimation strategies. *Transportation Research Part A: Policy and Practice*, 35(9), 823–845. [https://doi.org/10.1016/S0965-8564\(00\)00019-7](https://doi.org/10.1016/S0965-8564(00)00019-7)
- Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A., & Goodwin, P. (2008). Smarter Choices: Assessing the Potential to Achieve Traffic Reduction Using 'Soft Measures'. *Transport Reviews*, 28(5), 593–618. <https://doi.org/10.1080/01441640801892504>
- Carpentier, S. (Ed.). (2010). *La mobilité résidentielle transfrontalière entre le Luxembourg et ses régions voisines*. Éd. Saint Paul.
- Causa, O., & Pichelmann, J. (2020). *Should I stay or should I go? Housing and residential mobility across OECD countries*. OCDE. <https://doi.org/10.1787/d91329c2-en>
- Clark, W. A. V., Huang, Y., & Withers, S. (2003). Does commuting distance matter?: Commuting tolerance and residential change. *Regional Science and Urban Economics*, 33(2), 199–221. [https://doi.org/10.1016/S0166-0462\(02\)00012-1](https://doi.org/10.1016/S0166-0462(02)00012-1)
- Clark, W. A. V., & Maas, R. (2015). Interpreting Migration Through the Prism of Reasons for Moves: Migration Through the Prism of Reasons for Moves. *Population, Space and Place*, 21(1), 54–67. <https://doi.org/10.1002/psp.1844>
- Coulter, R., Ham, M. van, & Findlay, A. M. (2016). Re-thinking residential mobility: Linking lives through time and space. *Progress in Human Geography*, 40(3), 352–374. <https://doi.org/10.1177/0309132515575417>
- Coulter, R., & Scott, J. (2015). What Motivates Residential Mobility? Re-examining Self-Reported Reasons for Desiring and Making Residential Moves. *Population, Space and Place*, 21(4), 354–371. <https://doi.org/10.1002/psp.1863>
- Day, J., & Cervero, R. (2010). Effects of Residential Relocation on Household and Commuting Expenditures in Shanghai, China. *International Journal of Urban and Regional Research*, 34(4), 762–788. <https://doi.org/10.1111/j.1468-2427.2010.00916.x>

- De Vos, J. (2015). The influence of land use and mobility policy on travel behavior: A comparative case study of Flanders and the Netherlands. *Journal of Transport and Land Use*, 8(1), 171–190. <https://doi.org/10.5198/jtlu.2015.709>
- De Vos, J., Ettema, D., & Witlox, F. (2018). Changing travel behaviour and attitudes following a residential relocation. *Journal of Transport Geography*, 73, 131–147. <https://doi.org/10.1016/j.jtrangeo.2018.10.013>
- Decoville, A., & Durand, F. (2021). An empirical approach to cross-border spatial planning initiatives in Europe. *Regional Studies*, 55(8), 1417–1428. <https://doi.org/10.1080/00343404.2021.1902492>
- Deding, M., Filges, T., & Ommeren, J. V. (2009). Spatial Mobility and Commuting: The Case of Two-Earner Households*. *Journal of Regional Science*, 49(1), 113–147. <https://doi.org/10.1111/j.1467-9787.2008.00595.x>
- Diaz-Serrano, L., & Stoyanova, A. P. (2010). Mobility and housing satisfaction: An empirical analysis for 12 EU countries. *Journal of Economic Geography*, 10(5), 661–683. JSTOR.
- Dinç, P., Özbilen, E., & Bilir, M. B. (2014). A multi-dimensional scale for measuring residential satisfaction (rs) in mass housing projects. *Indoor and Built Environment*, 23(6), 864–880. <https://doi.org/10.1177/1420326X13484619>
- Diop, L. (2012). Par delà les frontières, les marchés de la métropole luxembourgeoise. *Etudes foncières*, 159, 35–41.
- Drevon, G., Gerber, P., Klein, O., & Enaux, C. (2018). Measuring Functional Integration by Identifying the Trip Chains and the Profiles of Cross-Border Workers: Empirical Evidences from Luxembourg. *Journal of Borderlands Studies*, 33(4), 549–568. <https://doi.org/10.1080/08865655.2016.1257362>
- Enaux, C., & Gerber, P. (2014). Beliefs about energy, a factor in daily ecological mobility? *Journal of Transport Geography*, 41, 154–162. <https://doi.org/10.1016/j.jtrangeo.2014.09.002>
- Ettema, D., & Nieuwenhuis, R. (2017). Residential self-selection and travel behaviour: What are the effects of attitudes, reasons for location choice and the built environment? *Journal of Transport Geography*, 59, 146–155. <https://doi.org/10.1016/j.jtrangeo.2017.01.009>
- Ewing, R., & Cervero, R. (2001). Travel and the Built Environment: A Synthesis. *Transportation Research Record: Journal of the Transportation Research Board*, 1780(1), 87–114.
- Ewing, R., & Cervero, R. (2010). Travel and the Built Environment. *Journal of the American Planning Association*, 76(3), 265–294. <https://doi.org/10.1080/01944361003766766>
- Gärling, T., Gillholm, R., & Gärling, A. (1998). Reintroducing attitude theory in travel behavior research: The validity of an interactive interview procedure to predict car use. *Transportation*, 25(2), 129–146.
- Gerber, P. (2012). Advancement in conceptualizing cross-border daily mobility: The Benelux context in the European Union. *European Journal of Transport and Infrastructure Research*, 12(2), 178–197.
- Gerber, P., & Carpentier, S. (2013). Mobilités et modes de vie: Vers une recomposition de l'habiter. In *Mobilités et modes de vie: Vers une recomposition de l'habiter*. Presses universitaires de Rennes. <http://doi.org/10.4000/books.pur.34471>

- Gerber, P., Caruso, G., Cornelis, E., & Chardon, C. M. de. (2018). A multi-scale fine-grained LUTI model to simulate land use scenarios in Luxembourg. *Journal of Transport and Land Use*, 11(1), Article 1. <https://doi.org/10.5198/jtlu.2018.1187>
- Gerber, P., Ma, T.-Y., Klein, O., Schiebel, J., & Carpentier-Postel, S. (2017). Cross-border residential mobility, quality of life and modal shift: A Luxembourg case study. *Transportation Research Part A: Policy and Practice*, 104, 238–254. <https://doi.org/10.1016/j.tra.2017.06.015>
- Gerber, P., Thériault, M., Enaux, C., & Carpentier-Postel, S. (2020). Links between Attitudes, Mode Choice, and Travel Satisfaction: A Cross-Border Long-Commute Case Study. *Sustainability*, 12(21), 9203. <https://doi.org/10.3390/su12219203>
- Hamersma, M., Tillema, T., Sussman, J., & Arts, J. (2014). Residential satisfaction close to highways: The impact of accessibility, nuisances and highway adjustment projects. *Transportation Research Part A: Policy and Practice*, 59, 106–121. <https://doi.org/10.1016/j.tra.2013.11.004>
- Handy, S. (1996). Methodologies for exploring the link between urban form and travel behavior. *Transportation Research Part D: Transport and Environment*, 1(2), 151–165. [https://doi.org/10.1016/S1361-9209\(96\)00010-7](https://doi.org/10.1016/S1361-9209(96)00010-7)
- Haslauer, E., Delmelle, E. C., Keul, A., Blaschke, T., & Prinz, T. (2015). Comparing Subjective and Objective Quality of Life Criteria: A Case Study of Green Space and Public Transport in Vienna, Austria. *Social Indicators Research*, 124(3), 911–927. <https://doi.org/10.1007/s11205-014-0810-8>
- Huber, P., & Nowotny, K. (2013). Moving across Borders: Who is Willing to Migrate or to Commute? *Regional Studies*, 47(9), 1462–1481.
- Jansen, S. J. T. (2012). What is the worth of values in guiding residential preferences and choices? *Journal of Housing and the Built Environment*, 27(3), 273–300. JSTOR.
- Kroesen, M., Molin, E. J. E., Miedema, H. M. E., Vos, H., Janssen, S. A., & van Wee, B. (2010). Estimation of the effects of aircraft noise on residential satisfaction. *Transportation Research Part D: Transport and Environment*, 15(3), 144–153. <https://doi.org/10.1016/j.trd.2009.12.005>
- Lanzendorf, M. (2003). Mobility biographies. A new perspective for understanding travel behaviour. *Moving through Nets: The Physical and Social Dimensions of Travel.*, 20. http://webarchiv.ethz.ch/ivt/news/archive/20030810_IATBR/lanzendorf.pdf
- Lorenz, O. (2018). Does commuting matter to subjective well-being? *Journal of Transport Geography*, 66, 180–199. <https://doi.org/10.1016/j.jtrangeo.2017.11.019>
- Lu, M. (1999). Determinants of residential satisfaction: Ordered logit vs. regression models. *Growth and Change : A Journal of Urban and Regional Policy*, 30(2).
- Martin, L., Hauret, L., & Fuhrer, C. (2022). Digitally transformed home office impacts on job satisfaction, job stress and job productivity. COVID-19 findings. *PLOS ONE*, 17(3), e0265131. <https://doi.org/10.1371/journal.pone.0265131>
- Müggenburg, H. (2021). Beyond the limits of memory? The reliability of retrospective data in travel research. *Transportation Research Part A: Policy and Practice*, 145, 302–318. <https://doi.org/10.1016/j.tra.2021.01.010>
- Müggenburg, H., Busch-Geertsema, A., & Lanzendorf, M. (2015). Mobility biographies: A review of achievements and challenges of the mobility biographies approach and a framework for

- 561 further research. *Journal of Transport Geography*, 46, 151–163.
562 <https://doi.org/10.1016/j.jtrangeo.2015.06.004>
- 563 Newman, P., & Kenworthy, J. (1996). The land use—transport connection: An overview. *Land Use*
564 *Policy*, 13(1), 1–22. [https://doi.org/10.1016/0264-8377\(95\)00027-5](https://doi.org/10.1016/0264-8377(95)00027-5)
- 565 Newman, P., & Kenworthy, J. (1999). *Sustainability and Cities: Overcoming Automobile*
566 *Dependence*. Island Press.
- 567 Nowok, B., Findlay, A., & McCollum, D. (2018). Linking residential relocation desires and behaviour
568 with life domain satisfaction. *Urban Studies*, 55(4), 870–890.
569 <https://doi.org/10.1177/0042098016665972>
- 570 Oh, J. (2020). Residential Mobility and Quality of Life between Metropolitan Areas: The Case of
571 South Korea. *Sustainability*, 12(20), 8611. <https://doi.org/10.3390/su12208611>
- 572 Oishi, S., & Tsang, S. (2022). The Socio-ecological Psychology of Residential Mobility. *Journal of*
573 *Consumer Psychology*, n/a(n/a). <https://doi.org/10.1002/jcpy.1310>
- 574 Rau, H., & Manton, R. (2016). Life events and mobility milestones: Advances in mobility biography
575 theory and research. *Journal of Transport Geography*, 52, 51–60.
576 <https://doi.org/10.1016/j.jtrangeo.2016.02.010>
- 577 Ren, H., & Folmer, H. (2017). Determinants of residential satisfaction in urban China: A multi-group
578 structural equation analysis. *Urban Studies*, 54(6), 1407–1425.
579 <https://doi.org/10.1177/0042098015627112>
- 580 Roberts, J., Hodgson, R., & Dolan, P. (2011). “It’s driving her mad”: Gender differences in the effects
581 of commuting on psychological health. *Journal of Health Economics*, 30(5), 1064–1076.
582 <https://doi.org/10.1016/j.jhealeco.2011.07.006>
- 583 Scheiner, J. (2007). Mobility Biographies: Elements of a Biographical Theory of Travel Demand
584 (Mobilitätsbiographien: Bausteine zu einer biographischen Theorie der Verkehrsnachfrage).
585 *Erdkunde*, 61(2), 161–173.
- 586 Scheiner, J. (2014). Residential self-selection in travel behavior: Towards an integration into mobility
587 biographies. *Journal of Transport and Land Use*, 7(3), 15.
588 <https://doi.org/10.5198/jtlu.v7i3.439>
- 589 Scheiner, J., & Holz-Rau, C. (2013). Changes in travel mode use after residential relocation: A
590 contribution to mobility biographies. *Transportation*, 40(2), 431–458.
591 <https://doi.org/10.1007/s11116-012-9417-6>
- 592 Scheiner, J., & Rau, H. (2020). *Mobility and Travel Behaviour Across the Life Course: Qualitative*
593 *and Quantitative Approaches*. Edward Elgar Publishing.
- 594 Schoenduwe, R., Mueller, M. G., Peters, A., & Lanzendorf, M. (2015). Analysing mobility
595 biographies with the life course calendar: A retrospective survey methodology for
596 longitudinal data collection. *Journal of Transport Geography*, 42, 98–109.
597 <https://doi.org/10.1016/j.jtrangeo.2014.12.001>
- 598 Sheller, M., & Urry, J. (2006). The New Mobilities Paradigm. *Environment and Planning A*, 38(2),
599 207–226. <https://doi.org/10.1068/a37268>
- 600 Shuai, X. (2012). Does Commuting Lead to Migration? *The Journal of Regional Analysis & Policy*,
601 42(3), 237–250.

- Simmonds, D., Waddell, P., & Wegener, M. (2013). Equilibrium versus Dynamics in Urban Modelling: *Environment and Planning B: Planning and Design*. <https://doi.org/10.1068/b38208>
- Sohn, C., Reitel, B., & Walther, O. (2009). Cross-Border Metropolitan Integration in Europe: The Case of Luxembourg, Basel, and Geneva: *Environment and Planning C: Government and Policy*. <https://doi.org/10.1068/c0893r>
- Stutzer, A., & Frey, B. S. (2008). Stress that Doesn't Pay: The Commuting Paradox. *Scandinavian Journal of Economics*, 110(2), 339–366. <https://doi.org/10.1111/j.1467-9442.2008.00542.x>
- Vega, A., & Reynolds-Feighan, A. (2009). A methodological framework for the study of residential location and travel-to-work mode choice under central and suburban employment destination patterns. *Transportation Research Part A: Policy and Practice*, 43(4), 401–419. <https://doi.org/10.1016/j.tra.2008.11.011>
- Wang, F., Mao, Z., & Wang, D. (2020). Residential relocation and travel satisfaction change: An empirical study in Beijing, China. *Transportation Research Part A: Policy and Practice*, 135, 341–353. <https://doi.org/10.1016/j.tra.2020.03.016>
- Wang, F., & Wang, D. (2020). Changes in residential satisfaction after home relocation: A longitudinal study in Beijing, China. *Urban Studies*, 57(3), 583–601. <https://doi.org/10.1177/0042098019866378>
- Zarabi, Z., Gerber, P., & Lord, S. (2019). Travel Satisfaction vs. Life Satisfaction: A Weighted Decision-Making Approach. *Sustainability*, 11(19), 5309. <https://doi.org/10.3390/su11195309>
- Zhu, Z., Li, Z., Chen, H., Liu, Y., & Zeng, J. (2019). Subjective well-being in China: How much does commuting matter? *Transportation*, 46(4), 1505–1524. <https://doi.org/10.1007/s11116-017-9848-1>