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Assessing residential location and commuting preferences

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Abstract

Understanding the interplay between residential location choices and commuting behavior is crucial for addressing urban mobility and housing policies. This paper introduces a comprehensive survey conducted in Germany, integrating three discrete choice experiments to simultaneously measure preferences for residential locations, commuting distances, and transportation modes. The sample comprises 1,169 employed respondents, recruited through a professional service provider with quotas based on age, gender, and residential location. Experiment 1 focused on residential location preferences without considering commuting characteristics, utilizing a Multiple Discrete-Continuous Extreme Value (MDCEV) model to assess budget allocations for various dwelling attributes. Results indicate that the quality of the residential area holds greater significance than the specific place of residence. Experiments 2 and 3 explored the trade-offs between dwelling characteristics and commuting time, alongside mode choice preferences. These experiments revealed that while dwelling attributes are prioritized over commuting duration, commuting time remains a significant factor in residential decisions. Notably, teleworking scenarios were associated with a reduction in the Value of Travel Time Savings (VTTS) for commuting, highlighting the diminishing burden of travel time for remote workers. The three experiments build progressively from housing preferences to commuting trade-offs and mode choices. Together, they reveal how residential and mobility decisions interact. The findings contribute valuable insights for integrating residential location and travel demand models, emphasizing the impact of teleworking on future commuting patterns. Future work will focus on joint model estimations and further integration into predictive models to inform integrated land-use and transport planning policies.

Keywords: residential location choices; stated choice experiment; commuting preferences; preference measurement

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Introduction

Daily, millions of individuals commute between their homes and workplaces. Since commuting is directly influenced by decisions regarding residential and workplace locations, an integrated perspective on mobility, housing, and employment is essential for researching commuting behavior. Previous studies corroborate the common experience that travel time, commuting patterns, and employment changes are significant determinants of residential location choices (Schirmer et al., 2014). However, understanding the relationship between long-term decisions, such as residential location choices, and short-term travel decisions within commuting contexts remains a research challenge, particularly as this relationship is continually evolving, as demonstrated by the COVID-19 pandemic.

Several empirical challenges arise when addressing both time horizons, including the dynamic interplay between residential choices and daily commuting, differing valuations of travel time for short- vs. long-term decisions, and framing effects in choice experiments. This results in a lack of political implications and data for future projections (for example see the discussion in Beck et al., 2017; Dubernet, Dubernet, Axhausen , 2020; Schmid et al., 2022). Additionally, these challenges increase given the high uncertainty about how ongoing trends might change future conditions. In particular, this includes potential changes in residential preferences due to the increasing share of people able to work from home (e.g. Mouratidis and Papagiannakis, 2021; Böhnen and Kuhnimhof, 2024) resulting potentially in lower value of travel time savings. Additionally, vehicle automation may contribute to a lower value of travel time, i.e., potential willingness to cover longer commuting distances (e.g. Kim, Mokhtarian, and Circella, 2020; Moore et al., 2020). Discrete choice experiments (DCEs) have been applied to study residential location and commuting trade-offs, for example in relocation-focused designs (Velvart et al., 2022), residential location enriched with commuting attributes (van Cranenburgh and Garrido-Valenzuela, 2023), and teleworking-related commuting choices (Lara-Pulido et al., 2021, 2023). Some efforts have combined multiple domains in a single DCE, most notably (Guo et al., 2020), who investigated residential, job, and transport choices jointly. Beyond DCEs, a large body of work has examined teleworking and its impacts on commuting behavior (Mokhtarian, 1991; Zhu, 2012; Stiles and Smart, 2021; Hernández-Tamurejo et al., 2024). However, these studies typically focus on either residential or commuting behavior, or integrate them only at the modeling stage. To our knowledge, no study has yet fully combined residential location and commuting choices—including teleworking—in a single integrated survey capturing both long- and short-term decisions, leaving a methodological gap that this study seeks to address.

This paper investigates current and future preferences for residential location and commuting, focusing on the interplay between long-term (residential location choices) and short-term (mode choices) decisions. While both domains have been studied separately, standard methods for addressing them jointly are lacking. *Methodologically*, this study integrates residential and commuting preferences within a single survey using multiple discrete choice experiments. The first experiment applies a novel priority evaluation approach for dwelling and location attributes; the second incorporates commuting duration and teleworking, deepening insights into daily mobility trade-offs. Together, these experiments generate an integrated dataset valuable for residential choice, travel demand, and joint modeling. We also discuss the challenges of designing such linked experiments and their potential for further methodological development. We view this contribution as a step toward an integrated methodology that links hierarchical travel-behavior decisions - long-term and short-term - by jointly analyzing residential location and commuting choices, while accounting for emerging trends such as teleworking. The use of advanced choice models provides a quantitative basis for predictive models of residential location and mode choice. *In terms of insights*, the study sheds light on trade-offs between dwelling features, location, and commuting attributes, with a particular focus on teleworking. Findings—most notably the reduced value of travel time savings (VTTS) among teleworkers—provide new empirical evidence with implications for urban mobility, housing policy, and predictive modeling. In sum, this work advances integrated methods, contributes a new dataset to the community, and delivers first insights into the evolving dynamics of residential and commuting decisions.

Study design and set up

The study aims to analyze the complex interplay between residential location choices and commuting-related decisions, taking into account changing conditions such as the growing prevalence of remote work and emerging trends like automated driving. The primary data collection method was an online survey covering following thematic

areas: current housing situation, respondents' travel behavior, employment status and teleworking preferences, three discrete choice experiments on residential location and commuting choices, acceptance of autonomous driving, along with socio-demographic information.

The experiments were as follows: (1) Residential location preferences, focusing on the choice of dwelling with various attributes relating to the dwelling itself and its location; (2) Residential location in combination with commuting trip distance, focusing on the choice of residential location described with fewer attributes than in the first experiment, but also taking into account commuting distance; and (3) Mode choice, focusing on the choice of mode of transport for the commuting trip, characterized by travel time and cost. Together, the results of these three experiments provide a deeper understanding of individuals' residential location and commuting choices. Additionally, they provide inputs for a residential location choice models as well as for travel demand models.

This paper focuses on presenting the methodology of the three experiments and their practical application. Given the novel approach of the three experiments, particularly their combination, in various aspects, we will thoroughly discuss the methodological challenges encountered and highlight key empirical findings and implementation insights.

Sample and data cleaning

The initial sample comprises 1,500 individuals representing the German working population concerning age, gender, and residential location (Bundesland). Respondents were recruited through a professional service provider using quotas based on these characteristics. The target group for the survey consisted of individuals aged 25 to 60. We assumed that questions about residential location choices in connection with commuting decisions are most relevant to those who have likely made their initial residential choices after completing vocational training or university. Additionally, this age range excludes individuals who are nearing retirement, when further relocations may become a primary consideration.

Following extensive data cleaning, the final sample comprises 1,169 respondents. Several criteria were applied during data cleaning to ensure sufficient data quality across the three experiments. A key challenge was mitigating fatigue effects, as respondents were highly focused in the first experiment but showed declining attention and motivation in later ones. This pattern was evident in the data, with some initially high-quality responses needing removal after assessing the third experiment. Three steps of data cleaning were performed. First, we removed speeders and implausible reference values, such as unrealistic dwelling prices per sqm, extreme dwelling sizes, and unusually low or high monthly costs or commuting trip lengths. Next, we removed respondents who spent less than a minute on the experiments. Finally, we identified and eliminated duplicates and implausible responses to open-ended questions. This process resulted in a 22% reduction of the initial sample. While this decrease may seem substantial, potential bias was mitigated by ensuring that the quotas for key characteristics remained consistent with the target population. Additionally, the excluded responses were deemed implausible based on random checks and predefined exclusion criteria. The final dataset contains no missing values, as all survey questions were mandatory for respondents.

Table 1 provides an overview of selected sociodemographic characteristics of the sample. After the extensive data cleaning, a comparison of age, gender, and Bundesland (not shown here) with national statistics revealed only minor differences, ensuring a representative sample for the target characteristics. The largest deviation (6%) was in the 35–44 age group, where we had a higher proportion of respondents than the German working population. The sample size is sufficient to allow for segment-specific analyses, and it is representative of the German working population of interest. This makes the dataset highly valuable for the research community studying residential location and commuting choices. Plans are in place to make the data publicly available.

Design of the discrete choice experiments

Experiment 1: Residential location

The first experiment focuses on understanding the importance of different characteristics of the dwelling and the location in residential choices. In this experiment, we explicitly excluded commuting characteristics. In the task, the respondents had to imagine that they are moving and have to choose a new rental dwelling. First, they were asked to choose the characteristics of the dwelling such that it meets the requirements and needs of their current household.

Table 1. Key sociodemographic characteristics of the respondents

Characteristic	Absolute frequency (n)	Relative frequency (%)
Age group		
25–34	310	27
35–44	392	34
45–54	286	25
55–59	180	15
Gender		
Male	560	48
Female	606	52
Other	3	0.3
Residential area		
Urban	549	47
Suburban	355	30
Rural	265	23
No. of household members		
1 Person	310	27
2 Persons	408	35
3 Persons or more	451	39
Currently teleworking		
Yes	391	33
No	778	67
Employment status		
Full-time employed (35 h/week or more)	892	76
Part-time employed (18-35 h/week)	248	21
Marginally employed (under 18 h/week)	22	2
Trainee	3	0.3
Other	4	0.3

Based on the individual responses, a price for the dwelling was computed in the background by the online survey system. The characteristics that respondents were required to specify, along with their corresponding categories and ”prices,” are listed in Table 2. The values for the price calculation are based on a linear regression model that uses data from the German Socio-Economic Panel (Goebel et al., 2024) to estimate the price per square metre of rented dwellings as a function of the dwelling characteristics listed. All characteristics (e.g., dwelling size in sqm, garden, balcony, distance to the nearest city center and within 10 km) were included as independent dummy variables, with cost per sqm as the dependent variable. The relative effect of each attribute on price was then calculated from its estimated coefficient.

After configuring their desired dwelling, the respondents had to imagine that they are not able to find a dwelling with the preferred characteristics or that the price is too high. A screenshot of the experiment is shown in Appendix Figure 1. Their next task was to choose the categories where they would rather make a compromise, i.e. dwelling characteristics they would be willing to do without. The computed budget was reduced by 20%, the total price was shown in red and the reduction towards the available budget changed dynamically depending on the adjustments made by the respondents. Once the respondents reached the available budget or went below it, this part of the experiment was concluded. In the last part of the experiment, the respondents were asked to imagine the opposite, i.e., that they still have a budget leftover. The budget was raised by 20%. They had to choose whether to upgrade the dwelling with regard to the attributes that were most important to them, or to continue the survey without making any changes (accepting that they already have their desired dwelling). The used method resembles a priority evaluator method used in a study on energy efficiency in housing and transport (see Axhausen and Jäggi, 2010). We developed it further and adjusted it to the purpose of our study. The 20% decrease and increase in the experimental budget were chosen after simulating the impact of different values on dwelling costs across income classes. Using German statistics, where average rent

Table 2. Characteristics of the dwelling and the residential location in the first experiment

Characteristic	Response category	Values for price calculation
Dwelling size in sqm	*a slider from 25 sqm to 350 sqm*	pre-defined base price per sqm
Outdoor space	garden	+12% base price sqm * sqm
	balcony	+15% base price sqm * sqm
	none	0
Condition of the dwelling	completely renovated	+9% base price sqm * sqm
	in a good condition	0
	renovation needed	−9% base price sqm * sqm
Residential area	(very) good residential area	+15% base price sqm * sqm
	average residential area	+8% base price sqm * sqm
	simple residential area	0
Place of residence	core area of a big / middle city	+20% base price sqm * sqm
	suburban area	+13% base price sqm * sqm
	rural area	0
Distance to nearest city center	under 10 km	+11% base price sqm * sqm
	between 10 and 25 km	+8% base price sqm * sqm
	25 km or further away	0

is about 30% of income, the simulations aimed to avoid exceeding this proportion or reducing it too far. However, the chosen value remains an assumption. In a way, this experiment can be seen as a discrete choice experiment, as it employs advanced methods from the Multiple Discrete-Continuous Extreme Value (MDCEV) model (see next section). Simply put, respondents must select one fixed category per attribute (e.g., ”garden” for ”outdoor space”), representing the discrete choice component, and specify how much they are willing to spend on it, which serves as the continuous variable. This approach facilitates the analysis of preferences and priorities for various dwelling and residential location characteristics.

The experimental design was inspired by the prevalent use of web portals (e.g. Immobilien Scout GmbH, 2024, in Germany) to find a new home. When searching on these portals, users define minimum values (e.g. for dwelling space) and maximum values for dwelling characteristics (e.g. for monthly rent) as well as an area in which the dwelling should be located (e.g. certain neighbourhoods). Particularly in tight housing markets, the initial search for a dwelling is usually unsuccessful. Users then adjust these parameters. These adjustments are likely to differ across households. While some households are willing to spend more, others are willing to sacrifice dwelling space or accept longer commutes. Therefore, this experiment aimed to investigate how these adjustments occur. It thus contributes to a better understanding of preferences in residential location choice. To the best of our knowledge, this study is the first to apply the priority evaluation format in combination with advanced discrete choice modeling to residential location and dwelling choice, whereas such models have been applied, for instance, to housing supply (**?**). The resulting data offer strong potential as a foundation for more accurate and sophisticated forecasting model

Experiment 2 and 3: Residential location, commuting and mode choices

In the second experiment, respondents were required to choose between two dwelling options. Dwelling and residential location characteristics were included, along with commuting time as attributes of the two alternatives. The third experiment focuses only on commuting mode choices and did not consider any residential location characteristics at all. The respondents had to choose between different modes of transport with corresponding travel times and cost for their commuting.

In Experiment 2, housing alternatives varied by cost, dwelling size (sqm), residential location (city, suburban, rural), and commuting time (15–60 minutes). Cost and size were pivoted around respondents' current values using levels of $-20\%, -10\%, 0\%, +10\%, +20\%$ of these reference values. Experiment 3 examined mode choice using a similar pivot design. Respondents chose among walking, cycling, car, and public transport. All modes included travel time; car and

public transport also included cost, and public transport included access/egress and waiting time (2, 5, 10 minutes). Reference values were based on respondents' reported main mode, travel time, and commuting distance, with values for non-chosen modes derived from distance and average speeds. A screenshot of Experiment 2 is shown in Appendix Figure 2.

The rationale for including two different experiments, both exploring travel time preferences for commuting, was that when people choose a residential location and dwelling, they may consider the duration of the commute, having in mind also their preferred mode of transport. By asking them in the same experiment to choose between different dwelling locations, given selected characteristics of the dwelling, and at the same time giving them a commute duration associated with the residential location, we can analyse the trade-off between commute duration and characteristics of the dwelling and the residential location. We assumed that it would have overloaded the respondents if we had also asked about the duration of the commute using different modes of transport in the same experiment. Including the mode choice experiment in addition to the second experiment allows us to obtain, on the one hand, an estimated value of travel time savings (VTTS) for commuting per month from the first experiment, and on the other hand, a VTTS for commuting based on the mode of transport from the third experiment. Another rationale for conducting the two experiments was supply inputs for different simulation models: the third experiment followed a "classical" approach for obtaining coefficients for the travel demand model while the second one could give first orientation of changes in travel time importance in a residential location model.

Conducting a single experiment combining residential location choices with commuting times for multiple modes would not allow us to distinguish long-term residential choices from short-term travel decisions. We would not know if respondents chose a dwelling because the travel time is acceptable by car or public transport, and we could not assess how changes in travel time might affect their choice. By including only commuting duration in Experiment 1, we can analyze the effect of the current mode. Presenting multiple modes simultaneously could also be unrealistic and cognitively demanding, as respondents may focus only on their usual mode. Since short-term mode choices are influenced by long-term residential decisions but occur at a different level, it is preferable to capture them separately.

To improve the design efficiency of both experiments, a Bayesian efficient design Bliemer and Rose (2006) was generated using Ngene software Choice Metrics (2021). Each experiment included six decision situations, organized into three blocks that were randomly assigned to respondents.

Note that several key dwelling and residential location characteristics in the second experiment, such as price and dwelling size, mirror those in the first experiment. This enables us to construct a comprehensive picture of individual preferences for residential location, commuting, and mode choice.

A key addition to both discrete choice experiments was an attribute representing a working scenario. Specifically, we introduced two scenarios: one involving teleworking, where respondents were asked to imagine commuting to the office only two days a week, and another involving regular commuting, where they were asked to assume commuting to the office every day. This additional attribute enabled us to analyze the impact of teleworking on VTTS for commuting trips.

Results and applications

Experiment 1: Residential location

The data from the three experiments was analysed using advanced discrete choice models. We employed a Multiple Discrete-Continuous Extreme Value (MDCEV) model to analyze the data from the first experiment. The results allow understanding budget allocation for various characteristics of the dwelling and the residential location, and in this way to analyse the importance and willingness to pay for these characteristics. For instance, our findings indicate that the residential area (e.g., very good residential area) is more influential than the specific place of residence (e.g., core area of a city). The estimated coefficients of the model allow simulations of residential choices differentiating by household type or other characteristics.

Data analysis for the first experiment is ongoing, with initial models yielding plausible and interpretable results. A key challenge in data preparation was that "dwelling size" was measured on a metric scale, whereas the model required a categorical format. To address this, we categorized dwelling size into three groups: small, medium, and large.

The initial results indicate that dwelling size is the most important factor in residential location choice, followed by location (particularly central areas) and access to a garden. A balcony is also valued, though to a lesser extent than gardens and location attributes. These findings are not surprising and highlight the central role of location in residential preferences. Further analyses are needed to explore potential differences across household types (e.g., families vs. young adults), as preferences may vary significantly. The novelty of this study lies in the use of a priority evaluator empirical format, which to our knowledge is the first applied to this research question. The data are well-suited for complex forecasting of dwelling and residential location choices, offering valuable insights for urban planning as well as housing market analyses. However, as this work presents only initial analyses, further estimation and model refinement are necessary to gain deeper insights.

Experiment 2 and 3: Residential location, commuting and mode choices

Data from the second and third experiments have already been analyzed using various methods, and initial results have been published. We have not yet performed a joint estimation of the models from the three experiments and may not pursue it. However, we plan to incorporate segment-specific results from other experiments (e.g., VTTS) as additional variables to explore whether preferences for dwelling and residential location vary based on VTTS for commuting. Also, a joint model based on the data from Experiment 1 and 2 is planned. Challenges related to this include dealing with cost and also with travel times. Cost is measured per month for housing but per trip for commuting, requiring a common scale such as a percentage of income, while travel time in the residential choice may depend on the assumed transport mode. Other challenges include differences in error variance between long- and short-term choices, correlations between attributes across experiments, and potential cognitive burden for respondents. Hence, joint modelling will be part of further contributions.

This paper focuses on the methodological approach, briefly mentioning the results to illustrate how the survey data can be applied. The analysis results from the two experiments suggest that dwelling characteristics hold greater importance in residential location choices than commuting duration. However, commuting duration was still a significant factor for residential location choices. Using the estimated coefficients from the second and third experiment, we were able to estimate values, i.e., willingness to pay, for commuting travel time and compare it to willingness to pay for dwelling and residential area characteristics. In both experiments, we observed a consistent effect of teleworking on VTTS for commuting. Teleworking led to a reduction in VTTS, indicating that individuals perceive commuting time as less burdensome when they commute to work only two days a week. This effect was analyzed also for different teleworker and non-teleworker segments. The results of this analysis is summarized in Dubernet and Kolarova (2024). In the paper, we highlight the differences in preferences across these segments using data from the second experiment and additionally present mode-specific VTTS based on the third experiment. In another paper, Kolarova and Dubernet (2024), we estimated models for both experiments based on household type (young household, family household, adult-only household). This approach provides a direct comparison of preferences for dwelling, commuting, and mode choice across various household types. Key insights from the analysis were firstly, that dwelling size positively influences housing choice, with city residents preferring urban locations and rural residents showing a strong aversion to cities; young households in cities are least likely to change location, while those in suburbs show no strong anti-city preference. Across all household types, teleworking reduces the importance of travel time savings compared to daily commuting. Secondly, teleworking reshapes commuting patterns but does not eliminate car dependence, particularly for family households that combine work trips with school drop-offs. Household type strongly influences mode choice, with adult-only households more open to sustainable transport, while most workers still favor hybrid models that keep commuting regular. We suggest that policymakers should account for these household-specific differences, as teleworking alone will not substantially reduce congestion or car use. The findings offer strong empirical support for a trend that has been previously hypothesized and partially observed in earlier studies. Table 3 provides an overview of the simple model estimations for Experiment 2, and Table 4 presents the corresponding results for Experiment 3. These initial results demonstrate the differences between the teleworking and non-teleworking scenarios and the results of Experiment 1 show that housing characteristics have a significant effect on choice.

During the analysis of the data from both experiments, we also initially estimated a joint model. Owing to the complexity of incorporating three household types, we excluded these analyses from the final paper (Kolarova and Dubernet, 2024). However, this remains a future step in our research. The advantage of joint estimation is its utilization of techniques commonly applied in mode choice analyses, where revealed and stated preference data are analyzed

Table 3. Results from the Model Estimation in Experiment 2

Parameter	Est	Std. dev.	t-test (0)
ß cost	-0.003	0.000	-21.45 ***
ß sqm	-0.022	0.001	20.43 ***
ß city	-0.157	0.048	-3.24 ***
ß suburban	Ref	NA	NA
ß rural	Ref	NA	NA
ß commute non teleworking	-0.047	0.002	-29.50 ***
ß commute teleworking	-0.036	0.001	-24.47 ***
Nr. of individuals = 1169, Nr. of rows in database = 7014			
LL(0) = -4861.73, LL(final) = -3640.11			

Table 4. Results from the Model Estimation in Experiment 3

Parameter	Est	Std. dev.	t-test (0)
asc walk	2.562	0.566	4.53 ***
asc bicycle	0.982	0.066	14.93 ***
asc car	Ref	NA	NA
asc public transport	-0.566	0.101	-5.62 ***
b time walk teleworking	-0.195	0.026	-7.38 ***
b time bike teleworking	-0.083	0.005	-16.71 ***
b time car teleworking	-0.035	0.006	-5.82 ***
b time public transport teleworking	-0.038	0.005	-7.17 ***
b time walk non teleworking	-0.284	0.037	-7.55 ***
b time bike non teleworking	-0.107	0.003	-27.11 ***
b time car non teleworking	-0.048	0.004	-11.86 ***
b time public transport non teleworking	-0.046	0.003	-13.40 ***
b access / egress time teleworking	-0.037	0.012	-3.10 ***
b waiting teleworking	-0.007	0.012	-0.60
b access / egress time non teleworking	-0.056	0.014	-3.94 ***
b waiting non teleworking	-0.043	0.013	-3.31 ***
b cost	-0.101	0.025	-3.99 ***
Nr. of individuals = 1169, Nr. of rows in database = 7014			
LL(0) = -9723.47, LL(final) = -5492.49			

concurrently. For this study, it allows a direct comparison of mode-specific commuting time parameters with those from the residential location choice experiment, and enables analysis of the trade-offs between mode-specific commuting time and dwelling/residential location characteristics. We believe that such analyses would not be feasible with a single experiment that combines both dwelling/residential location characteristics and mode-specific commuting time. As mentioned earlier, we argue that this would have overloaded respondents. Moreover, it would make it difficult to distinguish between two distinct decision levels: a long-term decision regarding residential location and commuting time (potentially including car ownership vs. public transport use) and a mid-term decision such as mode choice. Presenting a scenario where respondents must choose both a dwelling and a commuting trip with a specific mode of transport could confuse them, as they would need to consider both dwelling and mode-related decisions while also factoring in their ”typical” trip time with the mode they usually use.

Building on the insights gained from analyzing the experiment data, we attempted to incorporate them as inputs into a residential location model and a travel demand model. As noted, the mode choice experiment is a conventional method for obtaining empirical coefficients for utility functions of different transport modes in travel demand models.

However, since most models are already calibrated, introducing new coefficients for the complete utility functions poses a challenge. What we could leverage from the empirical data, though, is the VTTS as well as the reduction in VTTS for a teleworking scenario, which can be estimated for different user segments. Specifically, the teleworking-induced reduction in VTTS lowers the perceived cost of commuting, which may lead individuals to travel longer distances, shift mode choices, or increase trip frequencies. Accounting for this effect in travel demand models enables more accurate predictions of congestion, public transport demand, and infrastructure needs, and informs policies that support flexible work arrangements and spatial planning.

Moving further to the usage of the data results for residential location choice models, we suggest that the data can be used as an indirect input. The approach for this that we followed in our research porject was implementing the reduction of VTTS into the travel demand model which led to the calculation of "new" generalized cost (monetary cost for travel, such as fares and non-monetary factors, such as travel time or comfort) in the model. These then were used as an input for the residential location model providing concrete values for the considered effect - teleworking leads to perceiving travel time less burdensome and this might leads to willingness to cover longer distances and choosing residential locations which are further away from the working location. Please note that due to the paper's strict focus on the methodology of the experiments, we cannot provide an in-depth discussion of the modeling procedures used in the residential location and travel demand models, as was done in the original research projects where the data were collected. However, this brief discussion serves as an introduction to the potential applications of the data.

Conclusions and outlook

This paper aims to introduce a survey encompassing three experiments designed to explore residential location and commuting choices. The focus is on presenting the methodology, discussing the benefits and challenges of developing the study design, and providing example results. Furthermore, the paper examines the utilization of the data as inputs for model-based simulations.

In conclusion, having three distinct experiments that progressively address various aspects of dwelling and residential location choices, commuting-related decisions, and mode preferences enables a comprehensive understanding of how people balance residential location characteristics with commuting-related factors. We posit that the intricate interplay between selecting a desirable dwelling, balancing dwelling characteristics with commuting time, and preferences for different transport modes cannot be captured in a single experiment. Instead, it can be effectively addressed through multiple experiments within a single study.

The initial results from the data provide valuable insights, particularly regarding how preferences shift under new conditions, such as the teleworking option. We also present an initial discussion on integrating these analysis results into predictive models. A primary methodological challenge is the hypothetical bias often associated with discrete choice experiments. To mitigate this, we propose using reference values from respondents' current situations as a coping strategy, a method already frequently employed in such experiments (e.g., current travel time, dwelling size, and monthly cost).Using such reference values increases realism, provides a meaningful status quo option, and thus helps reduce the gap between stated and revealed preferences in DCEs. Another limitation of incorporating three experiments is respondent fatigue, necessitating careful and extensive data cleaning (resulting in our study in a 22% reduction) to ensure data quality. The sample size reduction from data cleaning did not affect representativeness, as target quotas for key respondent characteristics were maintained. Subgroup sizes (e.g., household types) remained adequate, though cleaning criteria should be carefully chosen.

This research contributes to the literature on residential location choices by integrating long-term residential decisions with short-term commuting behavior through a multifaceted experimental approach. Unlike previous studies that often treat these aspects separately, our methodology simultaneously measures dwelling and commuting choices, capturing trade-offs between location, dwelling attributes, and commuting options, including teleworking and emerging mobility trends. Using novel discrete choice experiments - including a priority evaluation for dwelling attributes—this study generates a unique dataset that bridges a critical gap, provides empirical evidence such as reduced travel time sensitivity among teleworkers, and offers insights to improve theoretical models, predictive modeling, and policy planning in urban mobility and housing.

Looking ahead, several avenues for future research emerge from our findings. One promising direction is to explore the impact of socio-economic factors beyond the scope of this study on residential location choices. Additionally,

longitudinal studies could provide deeper insights into how residential preferences evolve over time, particularly in response to ongoing societal and technological changes. Future steps for this study are: First, a detailed account of the full dataset, including the remaining questionnaire items and potential data applications, is planned. Second, a joint model estimations will be conducted in order to further investigate the relationship between long-term and mid-term decisions. Lastly, future focus of the work with the dataset will include further integrating the data into residential location and travel demand models.Empirically grounded data capture realistic trade-offs between residential location attributes and commuting options, revealing differences across household segments. These insights can inform policy on previously unknown effects and improve the accuracy of models that otherwise rely on assumptions.

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Appendix

Screenshot of a part of the first experiment, in original German version

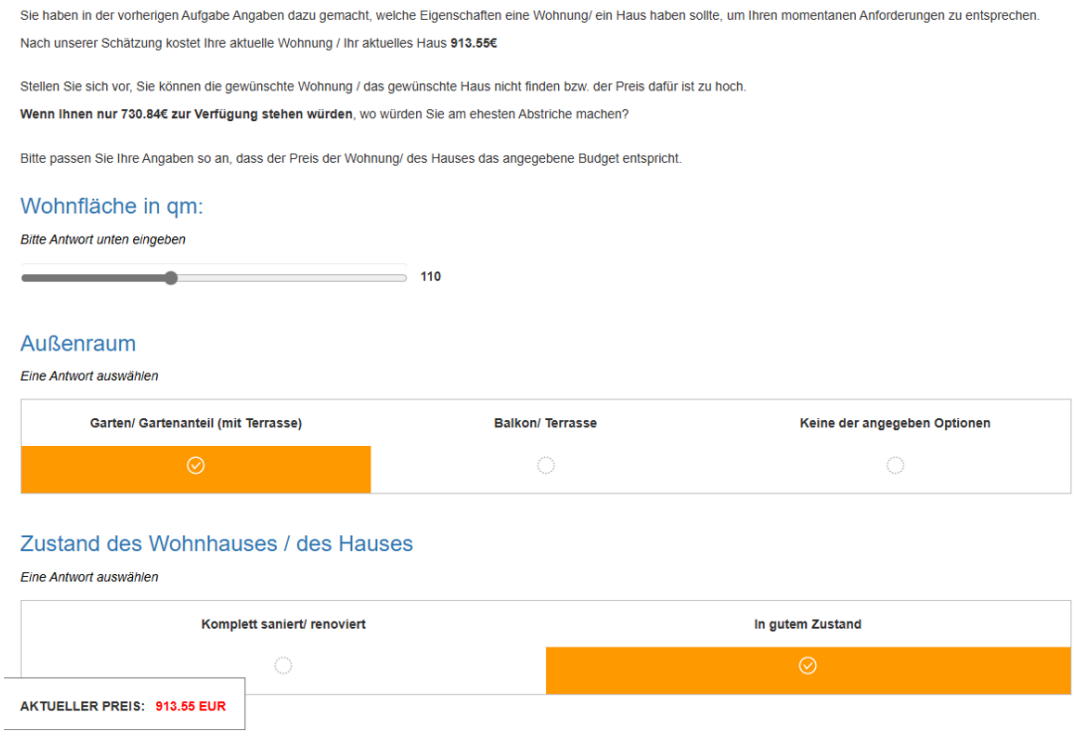
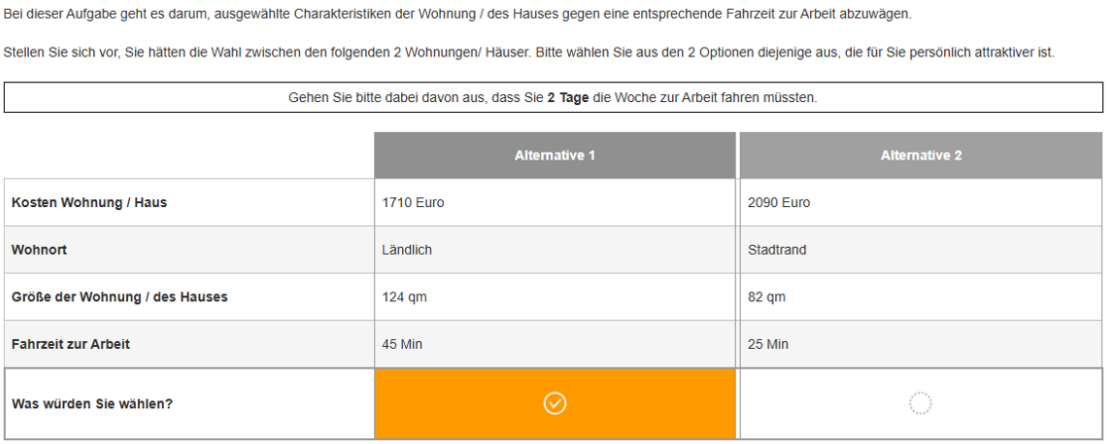


Fig. 1. Screenshot of a part of the first experiment

Screenshot of a part of the second experiment, in original German version



Bei dieser Aufgabe geht es darum, ausgewählte Charakteristiken der Wohnung / des Hauses gegen eine entsprechende Fahrzeit zur Arbeit abzuwägen.

Stellen Sie sich vor, Sie hätten die Wahl zwischen den folgenden 2 Wohnungen/ Häuser. Bitte wählen Sie aus den 2 Optionen diejenige aus, die für Sie persönlich attraktiver ist.

Gehen Sie bitte dabei davon aus, dass Sie **2 Tage** die Woche zur Arbeit fahren müssten.

	Alternative 1	Alternative 2
Kosten Wohnung / Haus	1710 Euro	2090 Euro
Wohnort	Ländlich	Stadtrand
Größe der Wohnung / des Hauses	124 qm	82 qm
Fahrzeit zur Arbeit	45 Min	25 Min
Was würden Sie wählen?	✓	○

Fig. 2. Screenshot of a part of the second experiment