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Front cover photography: Cultivated terraces enable farming on steep slopes and give the landscape a special character, even if they are overgrown in some places, as the example from the Haloze shows (photograph: Lenart Štaut).
Fotografija na naslovnici: Kulturne terase omogočajo kmetovanje na strmih pobočjih in dajejo poseben pečat pokrajini, tudi če se ponekod deloma zaraščajo, kot kaže tudi primer iz Haloz (fotografija: Lenart Štaut).

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PREDICTORS FOR RESIDENTIAL MOBILITY IN LATER LIFE: EMPIRICAL FINDINGS FOR THE YOUNG-OLD LIVING IN AN AUSTRIAN SMALL TOWN

Tatjana Fischer, Markus Jobst, Karl Moder

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The main square of Bruck an der Mur.

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Predictors for residential mobility in later life: Empirical findings for the young-old living in an Austrian small town

ABSTRACT: The article addresses residential mobility in later life from the perspective of the young-old, an under-explored topic in Austria. Data originating from a written survey conducted as part of a cross-sectional case study on people aged 60 to 74 years living in an Austrian small town are used to estimate prospective behaviour using logistic regression. The results show that women and people with a higher educational attainment are more likely to leave their current urban residential municipality, while men are more likely to relocate to a nursing home. Moreover, a duration of residence of 20 or more years decreases the probability of relocation. The findings confirm previous studies and highlight, that more spatially disaggregated data is needed to improve decision-making in town planning.

KEYWORDS: spatial research, cross-sectional study, aging in place, residential mobility, attitudes, Austria

Prediktorji stanovanjske mobilnosti v poznejšem življenjskem obdobju: empirični izsledki o mlajših starejših v manjšem avstrijskem mestu

POVZETEK: Članek obravnava stanovanjsko mobilnost v poznejšem obdobju življenja z vidika mlajših starejših, kar je v Avstriji slabo raziskano področje. Na podlagi podatkov, pridobljenih s pisno anketo med prebivalci manjšega avstrijskega mesta, starimi od 60 do 74 let, v okviru presečne študije primera, je z logistično regresijo ocenjeno njihovo prihodnje vedenje. Rezultati kažejo, da je za ženske in osebe z višjo izobrazbo bolj verjetno, da bodo zapustile mestno občino, v kateri živijo, medtem ko je za moške bolj verjetno, da se bodo preselili v dom za ostarele. Poleg tega se verjetnost preselitve zmanjša, če posamezniki v kraju prebivajo 20 let in več. Izsledki potrjujejo ugotovitve prejšnjih raziskav in poudarjajo potrebo po prostorsko bolj razpršenih podatkih za izboljšanje odločanja pri načrtovanju mest.

KLJUČNE BESEDE: prostorske raziskave, presečna študija, staranje na mestu, stanovanjska mobilnost, stališča, Avstrija

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1 Introduction

Demographic transition is evident globally in all spatial archetypes of areas in terms of a shift in the age structure of the population in favour of a growing number of people in later life (United Nations 2023) – including small towns (Steinführer et al. 2016). Consequently, older adults are receiving heightened political attention as a key target group. This is also true for urban planning (Grey et al. 2023). In the latter context, a central concern is to create age-friendly environments in order to support an active and healthy life for as long as possible. For this purpose it is essential to utilise the practical knowledge of people in later life (van Hoof and Marston 2021; Wood et al. 2022). From a spatial planning perspective old adults are considered relevant because of their heterogeneity in terms of (spatial) perception as well as expression of needs and ability to fulfil them autonomously. The heterogeneity of people in later life refers to the chronological age, state of health, caregiving obligations, social inclusion and spatial mobility – and thus varying capabilities to live independently –, socio-cultural background, the socio-economic status and lifestyle as well as the living and household arrangement (see Jaul and Barron 2021; Mauritz 2022; Stadelbacher and Schneider 2022). Whether and to what extent they feel comfortable in their current place of residence and (wish to or are able to) stay there may be influenced by various factors. These include:

- satisfaction with housing and housing conditions (size of the flat/house and garden), location and accessibility of the flat in the building, construction and technical equipment) and maintenance costs (Coleman et al. 2016; Bigonnesse and Chaudhury 2019),
- the location of the dwelling in the district/town, the perceived quality of the built and social environment and access to services (Schorra and Khalailab 2018), and place attachment (Jiaxuan et al. 2024),
- the availability of additional places of residence as well as the implications of life-changing private events such as changes of private affairs and living arrangements (Gillespie and Fokkema 2024; Wanka et al. 2024).

Lewis and Buffel (2020) found a positive correlation of duration of residence and emotional attachment to one's home. Moving to an institutional long-term care facility is a sensitive topic, as leaving one's private home is a pivotal incident in life which cannot be compared to a regular relocation (Haumann 2020).

Residential mobility or loyalty to current place of residence of people in later life is a well-established international research topic (Seo and Lee 2023). This refers both to the behaviour of staying in terms of aging-in-place and the (temporary/permanent) move to another municipality. The term aging-in-place is not clearly defined and comprises both staying in the current dwelling/house, the (temporary) relocation to another dwelling or changing the residence – e.g., from a private homes to a senior nursing home – within the current municipality of residence (Forsyth and Molinsky 2020).

1.1 More recent empirical findings on residential mobility of people in later life focussing on urban contexts

The literature review shows a focus on predicting residential mobility, in other words doing research on the aspirations and intentions to leave or stay. These studies (Table 1) reveal a number of factors that may have an influence both on the readiness to leave/relocate and the sedentariness – above all residential mobility experiences (Kramer and Pfaffenbach 2016), the duration of stay (Beyer et al. 2017; Kolland et al. 2018), the satisfaction with current housing conditions (Kramer and Pfaffenbach 2016; Kolland et al. 2018) and ownership (Matsumoto et al. 2016; Beyer et al. 2017), place attachment (Kramer and Pfaffenbach 2016; Matsumoto et al. 2016; Beyer et al. 2017; Kolland et al. 2018) as well as the ability to adapt to changes of the residential environment (Lewis and Buffel 2020). According to the empirical findings, women are more likely to move than men (Kramer and Pfaffenbach 2016; Matsumoto et al. 2016; Kolland et al. 2018); the young-old are more likely to move than older adults (Beyer et al. 2017; Kolland et al. 2018). Basically, a good state of health correlates with a higher likelihood to have any relocation plans (Beyer et al. 2017). Relocation to a residential long-term care facility in the case of need of care is more likely to occur for those old adults who (1.) have a negative perception of old age, but a positive attitude towards institutional care and nursing facilities, or (2.) live in a flat/house with reduced accessibility, but do not plan for any refurbishment (Kolland et al. 2018).

1.2 Significance of topic, purpose of the paper and research questions

Given the rising number of people in later life residing in urban areas and the increasing probability of being in need of care with age (Haß et al. 2023), particularly for evidence-informed political decision-making on housing issues, several questions remain unanswered: e.g., the time of significant occurence of vacancies in residential buildings (Nam et al. 2016) and the capacity planning of stationary long-term care facilities (Spangenberg et al. 2013). The topic of residential mobility is particularly relevant for small towns because they constitute a hybrid of urban and rural areas in terms of settlement structure, infrastructural facilities and development paths (Steinführer et al. 2016; Stöglehner 2019). This spatial archetype refers to municipalities with a population ranging from 5,000 up to 20,000 inhabitants (Stöglehner 2019).

As there is a lack of knowledge regarding spatial archetype contextualised residential mobility in later life in Austria, this article aims to identify predictors that are suitable for analysing the relevance of aging-in-place, respectively the willingness to relocate in later life using data originating from 2017 on the young-old (people aged 60 to 74 years) living in an Austrian small town. For this purpose, the following two research questions will help to address this issue:

- Research question 1: Which factors are decisive for old adults considering to leave their current municipality of residence?
- Research question 2: Who is considering to relocate to a stationary long-term care facility in case care is needed, and what are the factors that influence this consideration?

2 Material and methods

Original data from a standardised written survey conducted in 2017 of people aged 60 to 74 years living in Bruck an der Mur was used. The methodological approach of the secondary data analysis is presented below.

2.1 Case-study context and original data

Bruck an der Mur is the capital of the eponymous political district, located in Styria, a federal province of Austria (Figure 1).

As part of the Styrian territorial reform in 2015, the small town Bruck an der Mur was consolidated with the hitherto independent rural market town Oberaich. The new municipality Bruck an der Mur is characterised by a variety of settlement structures and housing types (Figure 2). At the beginning of 2017, Bruck had a population of 15,850 inhabitants (Statistik Austria 2018), approximately a quarter of the residents were aged 65 years plus (Fischer 2018). Against this backdrop, it is a key concern of the municipal authority to ensure that Bruck maintains its position as a feel-good town (Fischer 2018).

Subsequently, the municipal authority of Bruck an der Mur and the Mariazellerland-Mürztal LEADER region (for explanation: LEADER is a funding programme of the European Union to support the development of rural areas) jointly commissioned a study in 2017 in order to gain insights into the opinions of the young-old on the quality of life Bruck an der Mur and their aspirations to stay in or to leave Bruck (Fischer 2018) in later life. As part of this study, a postal survey was conducted in the first half of 2017 among 500 residents aged 60 to 74.

The sampling was carried out randomly and was stratified in proportion to the number of inhabitants of the two consolidated municipalities Bruck an der Mur and Oberaich. 110 people were selected for Oberaich and 390 people for Bruck an der Mur. The sample was drawn on a random basis in order to avoid errors due to the frequency of individual attributes such as the first name, surname or the year of birth. The questionnaire was developed in accordance with representatives of the municipal authority of Bruck an der

Figure 1: Location of Bruck an der Mur. ► p. 46
Figure 2: Impressions of Bruck an der Mur. ► p. 47

Table 1: Overview of more recent studies on residential mobility of old adults (2014–2024).

	Geographical context and spatial archetypes	Target group(s) and scientific interest with reference to this paper	Methods and data
Study 1 (Kramer and Pfaffenbach 2016)	Germany nine big or medium-sized cities, the latter located in and outside metropolitan areas	• residents aged 50 to 60 years, living in private homes • identification of parameters influencing the probability to stay in the current dwelling/in the current municipality of residence or to move to another municipality	prospective and retrospective cross-sectional, mixed-methods 5,500 questionnaires and 140 qualitative interviews statistical analysis using logistic regressions
Study 2 (Matsumoto et al. 2016)	Japan one big city	• residents aged 40 to 64 years, living in private homes • identification of relevant parameters for staying or relocation (to a nursing home, alternative residential setting, the children's home) in case of being unable to leave one's home or being bedridden	prospective cross-sectional postal survey with 616 valid responses statistical analysis using bivariate und multivariate regressions
Study 3 (Beyer et al. 2017)	Germany one market town, comparable to small towns in terms of population	• residents aged 50 and over, living in private homes • identification of relevant parameters regarding preferences, needs and actual plans for one's own old age	prospective cross-sectional postal survey with 2,156 valid responses
Study 4 (Lewis and Buffel 2020)	England, UK two areas located in north Manchester; both comparable to small towns in terms of population	• residents aged 50 and over, living in private homes • understanding trajectories of staying and/or moving from a life-course perspective in considering changes in in the physical (built), demographic and social (neighbourhood) environment.	prospective and retrospective mixed-methods, secondary data analysis using data from 24 qualitative longitudinal interviews plus a cross-sectional interview study with four participants of the previous referred study
Study 5 (Kolland et al. 2018)	Austria nationwide	• residents aged 60 and over, living in private homes • identification of relevant parameters regarding intentions to move (= change of place of residence) and understanding housing preferences	prospective cross-sectional telephone interviews with 1,001 people from all nine federal provinces (1/3 living in urban municipalities) statistical analysis using logistic regressions

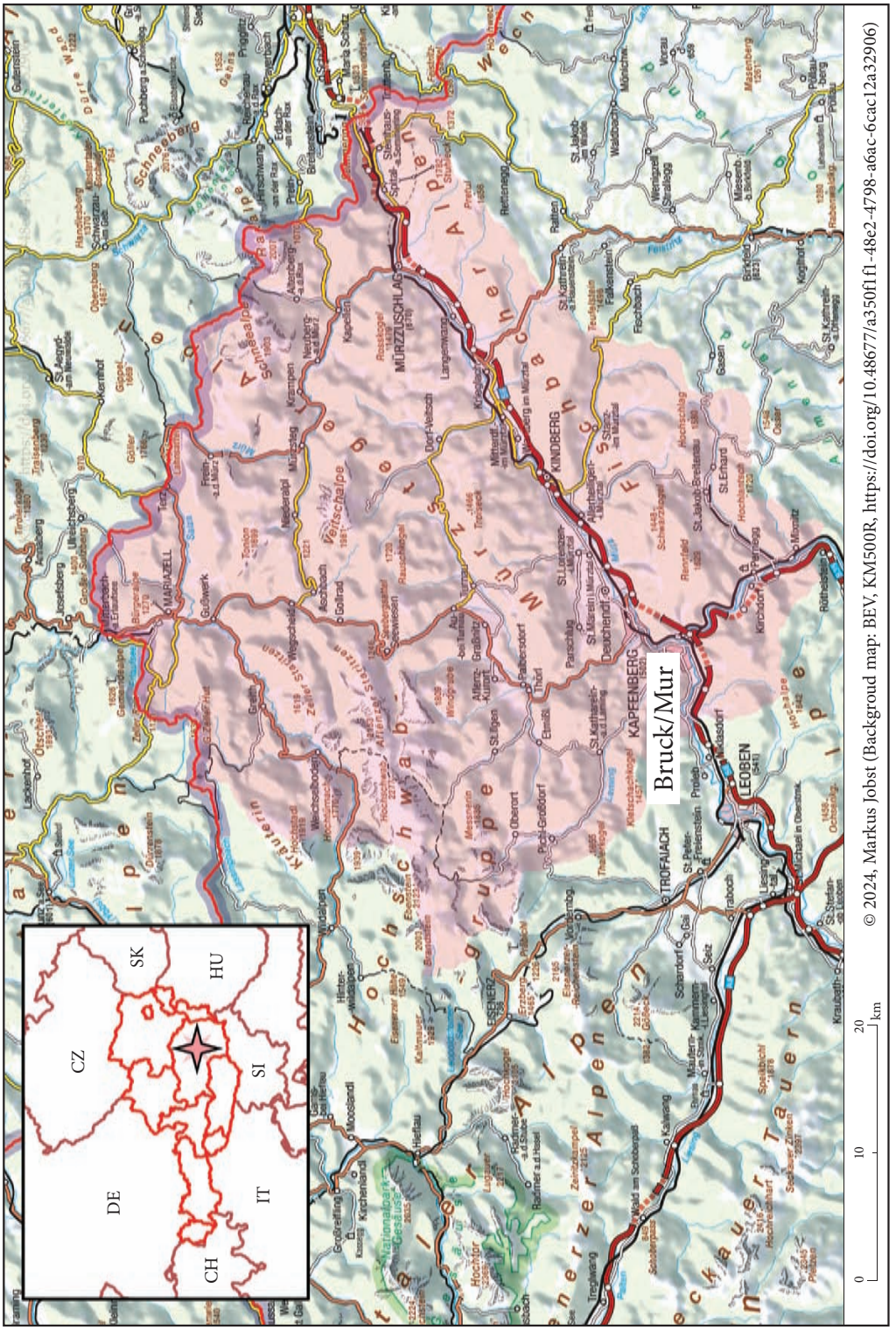
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Table 2: Original dataset, data modification and modified dataset.

Variable abbreviation	Variable (full name according to the original dataset)	Data modification (creation of new categories / (re-)labelling)	Variable labels (modified dataset)
Var2	district (= name of independent municipality prior to territorial reform) (excluded from modelling)	Yes. The information on the postal address was assigned to the two formerly independent municipalities.	0 = Oberaich, 1 = Bruck an der Mur
Var3	gender	No.	0 = male, 1 = female
Var4	age	Yes. The nominally scaled data were re-categorised.	0 = 60 to 69 years 1 = 70 to 74 years
Var7	educational attainment	Yes. In a first step, three categories were defined following Beyer et al. (2017). As category 1 (no education / compulsory school) contains only two observations, these two observations were emoved from the dataset and two categories were defined afterwards.	1 = intermediate school / other 2 = high school or higher
Var9	caregiving experiences (excluded from modelling)	Yes. The caregiving experience was queried indirectly by asking about the challenges of being a caregiving relative.	0 = no, 1 = yes
Var10	marital status	Yes. There were five categories for this variable in the original dataset: being single/living alone, living in a partnership, being married, divorced and widowed. The values *living in a partnership* and *married* were merged to the new category *living in a partnership or being married*. People who are widowed but living in a partnership were also assigned to this category. Due to the small number of observations and their implications for the confidence intervals, the five widowed people who are widowed but not living in a partnership were removed from the dataset.	1 = being single / living alone 2 = living in a partnership or being married 4 = divorced
Var11	duration of residence in Bruck	Yes. The original dataset contains numerical information on the year since which the individual has been living in Bruck (again). The information was converted into the duration of stay (= number of years) and assigned to two categories.	0 = less than 20 years 1 = 20 or more years
Var12	household structure	Yes. The original dataset contains information on the number of people living in the same household. Following Matsumoto et al. 2016, the data were assigned to three categories.	1 = living alone 2 = living together with one family member 3 = living together with more than one family member
Var13	housing type	Yes. In the original dataset, the following categories were assigned: 1 = rental flat, 2 = co-operative flat, 3 = owner-occupied property (flat/house), 4 = single-family or multi-family house. Rental flats, co-operative flats and owner-occupied property (flat/house) were merged to the *new category flat*.	0 = flat 1 = single-family or multi-family house
Var14	tenure (property)	Yes. In the original dataset, four categories were assigned: 1 = rental flat, 2 = co-operative flat, 3 = owner-occupied flat, 4 = single-family or multi-family-house Rental and co-operative flats were merged to the new category *rental flat*; owner-occupied, single-family and multi-family houses were merged to the new category »owner-occupied flat/house«	0 = rental flat 1 = owner-occupied flat/house

Variable abbreviation	Variable (full name according to the original dataset)	Data modification (creation of new categories / (re-)labelling)	Variable labels (modified dataset)
Var15	monthly net household income	Yes. The ordinal-scaled data were grouped into four categories.	1 = less than 1,000 Euros, 2 = 1,000 up to 1,999 Euros, 3 = 2,000 up to 2,9999 Euros, 4 = 3,000 Euros and more
Var16	migration type	No.	1 = loyal to location (Bruck/Mur) 2 = moved to Bruck/Mur 3 = returned to Bruck/Mur
Var17	aspiration to be able to live in one's home for as long as possible	No.	0 = no, 1 = yes
Var18	self-rated suitability of the current flat / house for old age	Yes. The original dataset contains three values: 1 = yes, 12 = yes and no, 2 = no. The two values *yes* and *yes and no* were merged to the new category yes.	0 = no, 1 = yes
Var19	**sometimes thinking about leaving Bruck = predicted variable (research question 1)**	**No.**	**0 = no, 1 = yes**
Var20	being emotionally attached to the community	Yes. The newly generated variable comprises all positive answers related to the question concerning the emotional aspects of place attachment. These include: being born and growing up in Bruck, childhood memories, bonds to close family and friends, neighbours. If one of these aspects was true, the respondent was ascribed an emotional attachment to the community.	0 = no, 1 = yes
Var21	emotional attachment to flat / house (and garden)	No.	0 = no, 1 = yes
Var22	**nursing homes as a conceivable option for a comfortable life in the case of being in need of care = predicted variable (research question 2)**	**No.**	**0 = no, 1 = yes**

Mur and comprised a total of 47 predominantly open-ended questions organised in seven thematic sections, namely:

- place of residence,
- housing situation and number of additional residences,
- quality of life in Bruck,
- quality of the historical town centre,
- residential mobility intentions and scenarios regarding care arrangements,
- socio-demographics and caregiving experiences (Fischer 2018).

In order to achieve a high response rate, the survey was publicly announced using various information channels. It was not scheduled to carry out a pre-survey. 121 questionnaires, which corresponds to a response rate of 24.2% were returned.

2.2 Modelling

2.2.1 Screening of original data and methodological pre-considerations

Both the pseudonymised original dataset and the code book were provided in xls-format. It was found that a) dataset with one exception, the data are nominally-scaled and b) there is a number of missing values.

It was decided to chose Variable 19 »sometimes thinking about leaving Bruck« as predicted variable for answering research question 1 and Variable 22 »nursing homes as a conceivable option for a comfortable life in the case of being in need of care« for answering research question 2 (Table 2). As the predicted variables only have two levels, a logistic regression (Agresti 2007) was chosen to analyse the data. With regard to the selection of the independent variables, attention was paid to the statistical basic principle as following: »inclusion of as many independent variables as necessary – inclusion of as few independent variables as possible«. Consequently, only variables that are assumed to influence the predicted variables should be included in the model. For that purpose more recent international gerontological literature (Table 1) was consulted.

Due to the fact that the original dataset includes information on the »residential history« for 116 out of the 121 respondents, it was decided to include this information in the modelling. According to the information provided, one in two respondents had moved to Bruck in the course of life, 12% (14 respondents) had returned to Bruck in the course of life and 38% of the respondents have never lived anywhere else than in Bruck and can thus be described as »loyal to location«.

In order to make appropriate decisions and carry out the modelling, the original dataset was reduced to the (independent) variables considered relevant (Table 2). For two of them, the number of categories was reduced in order to obtain an appropriate number of observations per category – following Agresti (2007) a minimum of approximately 10 observations is needed. Then the modified dataset was analysed using the statistical software SAS (version 9.4).

As informal caregiving for one's parent(s) is widespread in Austria (Nagl-Cupal et al. 2018), including (former) caregiver experiences (Table 2, Var9) seemed to be an interesting and novel independent variable for modelling mobility (aspirations) in later life. However, this parameter could not be included, because 97 of the 121 respondents did not provide any information or crossed the corresponding question out. So it was not possible to deduce whether the »missing values« related explicitly to a lack of caregiving experiences or a reluctance to answer the question.

Furthermore, for this article it was intended to reveal any intra-urban-specific differences (Table 2, Var2) regarding aging and place and relocation aspirations. This had to be set aside due to the lack of information.

2.2.2 The models in detail

Model 1 aims to address the research question 1 and estimate the probability of leaving Bruck an der Mur (Var19 = 1) using the following eight independent variables (parameters): district, gender, educational attainment, marital status, household structure, tenure (property), migration type and emotional attachment

to flat/house and garden. The parameters were selected following the more recent related literature listed in Table 1.

In order to answer research question 2, which aims to estimate the probability to consider to relocate to a nursing home in case care is needed (Var22 = 1), three models – referred to below as **Model 2a**, **Model 2b** and **Model 2c** – were developed in order to comprise the variety of potential influencing variables.

Model 2a adopts a rational-materialistic perspective and includes the following six variables, partly with reference to Kramer and Pfaffenbach (2016), Matsumoto et al. (2016) as well as Kolland et al. (2018): gender, educational attainment, housing type, tenure (property), net monthly household income and self-rated suitability of the apartment/house for old age.

Model 2b focusses on age-related emotional attachment to one's home and living arrangements and includes the following seven independent variables partly following Matsumoto et al. (2016) as well as Beyer et al. (2017): age, educational attainment, duration of residence in Bruck an der Mur, household structure, housing type, tenure (property) and emotional attachment to flat/house (and garden).

Model 2c focusses on the age-related appraisal of housing conditions and includes the following seven independent variables mainly in accordance with Matsumoto et al. (2016): age, gender, educational attainment, type of housing, tenure (property), monthly net household income and self-rated suitability of the flat/house for old age.

2.3 Statistical analysis

Due to missing values, it was necessary to remove seven records from the original dataset. The dataset used for further statistical analysis now comprised 114 observations. In logistic regression data records must be complete. For this reason, only 82 observations for **Model 1**, 90 observations for **Model 2a**, 84 observations for **Model 2b** and 83 observations for **Model 2c** could be included. The predicted variables were modelled using the selected independent variables and the influence of these independent variables on the predicted variables was estimated. The parametric estimates were interpreted with reference to the significance of the respective independent variable.

3 The sample at a glance

Table 3 provides an overview of the socio-demographic profile, socio-economic status, living arrangements and duration of residence in Bruck an der Mur and the respondents' thoughts regarding their life in later life. The sample comprises mainly respondents currently living in Bruck (70%). The mean age of the 114 respondents is approximately 68 years. Women have a share of about 55% of the respondents. Slightly more than a quarter of the respondents have an educational attainment that is high school or higher. The majority of respondents (82.5%) live in a partnership or is married. 57% are living in a flat, 42% in a single-family or a multi-family house. About two in three respondents live in an owner-occupied property (flat/house) (69.3%). Approximately 15% of the respondents have a monthly net household income of less than 1,000 Euros, 19.3% have an income of more than 3,000 Euros and around one in three has an income of between 2,000 and 3,000 Euros. About half of the respondents (48.2%) had moved to Bruck an der Mur during their course of life, whereas about 38% had never lived in any other place than Bruck an der Mur. Furthermore, approximately one in ten have returned to Bruck. The average duration of residence in Bruck is 46 years, about 80% have been living in Bruck an der Mur for at least 20 years. 82 respondents (about 72%) feel emotionally attached to their home. Respondents expressed the following thoughts on their (future) residential mobility and the option of relocating to a nursing home in case of need as follows: 11 respondents (9.6%) stated that they sometimes think about leaving Bruck an der Mur. 106 respondents (93.0%) would prefer to live in their home for as long as possible, 79 respondents (69.3%) rated their home suitable for old age and 36 respondents (31.6%) indicated they would consider to relocate to a nursing home in case care is needed.

Table 3: Characteristics of the sample (N = 114).

mean age, years (SD)	67.8 (4.4)
female	63 (55.3%)
male	51 (44.7%)
60 up to 69 years old	65 (57.0%)
70 up to 74 years old	39 (34.2%)
intermediate school / other	75 (65.8%)
high school or higher	27 (23.7%)
loyal to location (Bruck/Mur)	43 (37.7%)
moved to Bruck/Mur	55 (48.2%)
returned to Bruck/Mur	12 (10.5%)
single	10 (8.8%)
living in a partnership / being married	94 (82.5%)
divorced	9 (7.9%)
living alone	20 (17.5%)
living together with one family member	79 (69.3%)
living together with more than one family member	14 (12.3%)
monthly net household income less than 1,000 Euros	17 (14.9%)
monthly net household income 1,000 up to 1,999 Euros	31 (27.2%)
monthly net household income 2,000 up to 2,999 Euros	37 (32.5%)
monthly net household income 3,000 Euros and more	22 (19.3%)
living in the former independent municipality »Bruck an der Mur«	80 (70.2%)
living in the former independent municipality »Oberaich«	23 (20.2%)
average duration of residence (in Bruck an der Mur)	46 years
living in Bruck an der Mur for less than 20 years	16 (14.0%)
living in Bruck an der Mur for 20 or more years	91 (79.8%)
living in a flat	65 (57.0%)
living in a single-family or multi-family house	48 (42.1%)
rental flat	34 (29.8%)
ownership-occupied property (flat/house)	79 (69.3%)
sometimes thinking about leaving Bruck an der Mur	11 (9.6%)
not thinking about leaving Bruck an der Mur	97 (85.1%)
emotional attachment to flat/house and garden given	82 (71.9%)
emotional attachment to flat/house and garden not given	29 (25.4%)
living in one's home for as long as possible is a key concern	106 (93.0%)
living in one's home for as long as possible as is not a key concern	1 (0.9%)
suitability of the current flat/house for old age given	79 (69.3%)
suitability of the current flat/house for old age not given	26 (22.8%)
nursing homes are a conceivable option for a comfortable life in the case care is needed	36 (31.6%)
nursing homes are not a conceivable option for a comfortable life in the case care is needed	76 (66.7%)

4 Results

In this section, the results of the statistical analyses are presented separately for each research question in both text and tables. The main reason to provide the estimated values and the results of the significance tests in tables is to recognise the magnitude of any deviations in the data. That is why the confidence intervals of the odds ratios are also listed. In order to avoid over-interpretation, only the results for those independent variables that have a significant influence on the predicted variables are described.

4.1 Considering to leave Bruck an der Mur

The statistical analysis shows that two variables have a significant influence on the probability to leave: gender (p = 0.0482) and educational attainment (p = 0.0311) (Table 4).

If the label of the variable »gender« is equal to 0 (men), the probability for leaving drops to 0.3394 compared to the men who prefer to stay (Table 5). A total of five male respondents favour the idea of leaving.

Table 4: Results of significance tests for the independent variables (parameters) – model 1.

Independent variable (parameter)	Degrees of Freedom	Wald Chi-Square	Chi-Square p	Assessment
district	1	0.1979	0.6564	not significant
gender	**1**	**3.9021**	**0.0482**	**significant**
educational attainment	**1**	**4.6478**	**0.0311**	**significant**
marital status	2	0.7604	0.6837	not significant
household structure	2	0.9210	0.6310	not significant
tenure (property)	1	0.6556	0.4181	not significant
migration type	2	0.1049	0.9489	not significant
emotional attachment to flat/ house and garden	1	0.2625	0.6084	not significant

Note: significance level alpha = 0.05.

Table 5: Estimated values for respondents with identical attributes – model 1.

Independent variable (parameter)	Degrees of Freedom	Maximum-Likelihood--estimated value	Odds ratio
district Oberaich	1	–0.2304	0.7942
men	**1**	**–1.0806**	**0.3394**
educational attainment lower than high school	**1**	**–1.1414**	**0.3195**
single	1	–0.9791	0.3756
living in a partnership, being married	1	0.8474	2.3336
living alone	1	0.9084	2.4804
living together with one family member	1	–0.2107	0.8173
living in a rental flat	1	–0.5466	0.5789
being loyal to location (Bruck an der Mur)	1	0.1053	1.1110
moved to Bruck an der Mur	1	0.1657	1.1802
being not emotionally attached to flat/house and garden	1	–0.3586	0.6986

Note: significance level alpha = 0.05. Significant attributes are in bold.

If the label of the variable educational attainment is equal to 1 (educational attainment less than high school), the probability of leaving drops to 0.3195 compared to people with an educational attainment lower than high school who want to stay (Table 5).

With regard to the idea to leave, no district-related differences can be identified (Table 6). For the two significantly relevant parameters gender and educational attainment, the probabilities for leaving Bruck an der Mur can be described as follows: the proportion of men who are considering to leave in comparison to the proportion of women who are considering to do so is 0.115 (Table 6).

The proportion of respondents with an educational attainment lower than high school considering to leave Bruck compared to those with an educational attainment of high school or higher is 0.102 (Table 6).

4.2 Considering relocation to nursing homes in case of need

Regarding the consideration to relocate to a nursing home in the case of being in need of care the statistical analyses (Table 7) show for **Model 2a** that none of the six parameters has a significant relevance. **Model 2b** indicates a significant relevance for parameter duration of residence ($p = 0.0204$) and **Model 2c** for parameter gender ($p = 0.0469$). Regarding model 2b: If the duration of residence is less than 20 years, the estimated probability to consider a nursing home as an option is 2.3 times higher compared to those respondents who do not consider to relocate to a nursing in case care is needed (Table 8). Furthermore, it was calculated that respondents who have been living in Bruck an der Mur for less than 20 years are approximately 5.5 times more likely to consider to relocate to a nursing home than those who have been living in Bruck for 20 or more years (Table 9).

Regarding **Model 2c**: If the parameter gender is equal to 0 (men), the estimated probability to consider relocating to a nursing home is 1.8 times higher compared to men who don't (Table 8). Furthermore, it was calculated that men are three times more likely to consider relocating to a nursing home than women (Table 9).

Table 6: Estimated values for respondents with different attributes – Model 1.

Independent variable (parameter)	Odds ratio
district Oberaich (ref. Bruck)	0.631
men (ref. women)	**0.115**
educational attainment lower than high school (ref. high school or higher)	**0.102**
single (ref. not being single)	0.329
living in a partnership/married (ref. not living in a partnership)	2.046
living alone (ref. living together with more than one family member)	4.983
living together with one family member (ref. living together with more than one family member)	1.627
rental flat (ref. owner-occupied property)	0.335
loyal to locality (ref. returned to Bruck an der Mur)	1.457
moved to Bruck an der Mur (ref. returned to Bruck an der Mur)	1.548
not being emotionally attached to flat/house (and garden) (ref. being emotionally attached to flat/house and garden	0.488

Note: significance level alpha = 0.05. Significant attributes are in bold.

Table 7: Results of significance tests for the independent variables (parameters) – Model 2a, Model 2b and Model 2c.

Independent variable (parameter)	Model 2a				Model 2b			Model 2c		
	Degrees of Freedom	Wald Chi-Square	Chi-Square p	Assessment	Wald Chi-Square	Chi-Square p	Assessment	Wald Chi-Square	Chi-Square p	Assessment
age	1	–	–	–	0.5422	0.4615	not significant	0.0007	0.9792	not significant
gender	1	2.6511	0.1035	not significant	–	–	–	3.9472	0.0469	**significant**
educational attainment	1	0.8806	0.3480	not significant	1.7135	0.1905	not significant	1.7215	0.1895	not significant
household structure	2	–	–	–	0.2802	0.8693	not significant	–	–	–
housing type	1	2.6562	0.1031	not significant	2.9425	0.0863	not significant	2.6780	0.1017	not significant
tenure (property)	1	1.2643	0.2608	not significant	2.6085	0.1063	not significant	2.0904	0.1482	not significant
monthly net household income	3	0.5606	0.9054	not significant	–	–	–	0.1251	0.9887	not significant
suitability of the current flat / house for old age	1	3.3509	0.0672	not significant	–	–	–	1.4333	0.2312	not significant
duration of residence (in Bruck an der Mur)	1	–	–	–	5.3747	0.0204	**significant**	–	–	–
emotional attachment to flat / house and garden	1	–	–	–	0.0004	0.9837	not significant	–	–	–

Note: significance level alpha = 0.05

Table 8: Estimated values for respondents with identical attributes – Model 2a, Model 2b und Model 2c.

Independent variable (parameter)	Model 2a			Model 2b		Model 2c	
	Degrees of Freedom	Maximum--Likelihood--estimated value	Odds ratio	Maximum--Likelihood--estimated value	Odds ratio	Maximum--Likelihood--estimated value	Odds ratio
60 to 69 years old	1	–	–	–0.1943	0.447	–0.00689	0.993
men	1	0.4316	1.5397	–	–	**0.5657**	**1.761**
educational attainment lower than high school	1	0.2767	1.319	0.4555	1.57696	0.4284	1.535
living alone	1	–	–	0.2732	1.314	–	–
living with one family member	1	–	–	–0.0465	0.9546	–	–
living in a flat	1	0.4670	1.595	0.5519	1.7365	0.4842	1.623
living in a rental flat	1	–0.3688	0.692	–0.5804	0.55967	–0.5113	0.599
monthly net household income less than 1,000 Euros	1	–0.3023	0.739	–	–	0.0711	1.074
monthly net household income 1,000 up to 2,000 Euros	1	–0.0489	0.952	–	–	–0.0590	0.943
monthly net household income 2,000 up to 3,000 Euros	1	0.00109	1.001	–	–	–0.1226	0.882
suitability of the current flat / house for old age	1	0.5244	1.689	–	–	0.3707	1.449
residing in Bruck an der Mur for less than 20 years	1	–	–	**0.8532**	**2.347**	–	–
not being emotionally attached to flat / house and garden	1	–	–	–0.00721	0.9928	–	–

Note: significance level alpha = 0.05. Significant attributes are in bold.

Table 9: Estimated values for respondents with different attributes – Model 2a, Model 2b und Model 2c.

	Odds ratio		
Independent variables (parameter)	Model 2a	Model 2b	Model 2c
aged 60 to 69 years (ref. 70 to 74 years)	–	0.678	0.986
men (ref. women)	2.371	–	**3.100**
educational attainment lower than high school (ref. high school or higher)	1.739	2.487	2.356
living alone (ref. together with more than one family member)	–	1.648	–
living together with one family member (ref. living together with more than one family member)	–	1.197	–
flat (ref. house)	2.544	3.015	2.634
rental flat (ref. owner–occupied property)	0.478	0.313	0.360
monthly net household income less than 1,000 Euros (ref. 3,000 Euros and more)	0.521	–	0.961
monthly net household income 1,000 up to 2,000 Euros (ref. 3,000 Euros and more)	0.671	–	0.844
monthly net household income 2,000 up to 3,000 Euros (ref. 3,000 Euros and more)	0.705	–	0.792
suitability of the current flat / house for old age not given (ref. suitability given)	2.854	–	2.099
residing in Bruck an der Mur for less than 20 years (ref. 20 or more years)	–	**5.510**	–
not being emotionally attached to flat / house and garden (ref. being emotionally attached)	–	0.986	–

Note: significance level alpha = 0.05. Significant attributes are in bold.

5 Discussion

To discuss the empirical findings, related studies, both international and national (Table 1) are referred to. At this point, it should be noted that these studies explore the (predicted) residential mobility for differing age groups, which means that the surveyed target groups are either younger or older than the surveyed population of Bruck an der Mur. It should also be noted that the research questions in the studies differ.

5.1 Content-related discussion of the results

5.1.1 To stay or to leave Bruck?

The sample shows a strong preference for aging in place (85.1% of respondents) – here defined as the intention to stay in Bruck an der Mur – and the aspiration to live in one's home for as long as possible (93.0% of respondents) (Table 3). Factors such as where respondents live in Bruck, their marital status, migration history, and residential loyalty – indicating that one in three respondents has lived in the same place for an average of 46 years – as well as whether they own their home or are emotionally attached to it and its garden, do not significantly influence their consideration of leaving Bruck. The results thereby differ from those from Kramer and Pfaffenbach (2016), Matsumoto et al. (2016) and Kolland et al. (2018). Since the number of previous moves (including relocations within the town) was not investigated, the influence of the previous residential mobility on sedentariness as well as the significance of the preference to live in one's own walls for as long as possible could not be appraised from a life-course perspective.

The results of the modelling indicate that gender and educational attainment have a significant influence on the consideration to leave; as a result, men are more likely to stay than women. Matsumoto et al. (2016) found similar results for residents aged 40 to 64 years of a large Japanese city, as did Kolland et al. (2018) in the telephone survey of around 1,000 people aged 60 plus in Austria, which was carried out at the same time as the data collection in Bruck. However, Kolland et al.'s (2018) findings do not support our result that respondents with a higher educational attainment were more likely to consider to relocate than those with a lower educational attainment. It is not clear to what extent the socio-cultural profile of older adults is relevant for the sedentary behaviour, due to the fact that neither place of birth nor citizenship were surveyed. Additionally, due to missing information regarding the number and spatial information of any further places of residence, residential mobility against the backdrop of multilocality cannot be discussed in the context of spatial archetypes (Fischer 2022).

5.1.2 Nursing homes as an option in case care is needed?

Engaging with the topic of living and housing at old(er) age, respectively in need of care might be perceived to be unpleasant (Franco et al. 2021). This is also *true* for the respondents: about 60% of the 121 respondents stated that they do not consider elder care and nursing in a sincere manner (Fischer 2018). Against this background, the findings from the logistic regression models need to be interpreted with caution.

If one focusses on the duration of residence – a parameter identified as significant in model 2b – and the self-ratings regarding the suitability of the (current) flat or house for old age, it becomes apparent that the longer the duration of residence, the higher the suitability is rated. The ratio of respondents who rate their current home suitable compared to those who don't is 2.25:1 for those living in Bruck less than 20 years, and 3.5:1 for those living in Bruck for 20 years or longer. This finding is in line with those of Kolland et al. (2018) for Austria.

However, it cannot be inferred from the available information to what extent these differences are actually related to the district where the flat/house is located. This also applies for the location of the flat in the residential building and its accessibility or other (individual) reasons. Nonetheless, the findings suggest that housing satisfaction correlates positively with the duration of residence, regardless of the spatial archetype of the residential municipality. By contrast, in model 2c the parameter gender is identified as significant. This indicates that men are more open to a (future) relocation to a nursing home compared to women of the same age. This finding is in line with that of Matsumoto et al. (2016) and Kolland et al. (2018).

5.2 Strength and limitations of the study

In contrast to related works (Table 1), this article focuses on a comparatively narrowly defined age cohort, namely people aged 60 to 74 years. With regard to modelling, due to the richness of content of the original data it was possible to base the choice of parameters on previous (international) research on predictors for leaving Bruck in the (near) future on the one hand and relocation to a nursing home in case of need of case on the other hand and furthermore, to develop several models for answering the latter research question. The validity of the models was tested using the ROC curve, which compares the estimated to the observed value. The AUC (Area Under the Curve) value for **Model 1** is 0.87, for **Model 2a** 0.68, for **Model 2b** 0.71 and for **Model 2c** 0.70. As a reference value, an AUC of 0.70 to 0.90 corresponds to a moderate and an AUC greater than 0.90 to a high diagnostic quality of a test (Hosmer Jr. et al. 2013). This means that the diagnostic quality of **Model 1** may be considered good and the quality of **Model 2a**, **Model 2b** and **Model 2c** may be considered moderate.

No relevant correlations were found between the independent variables, which has a positive effect on the stability of the analysis. Moreover, there are no outliers in the statistical sense nor any anomalies in the diagnosis of influence. So, nothing particularly conspicuous in terms of statistics could be detected.

With regard to modelling, in contrast to related studies, neither the health status nor the (number of) adult children were taken into account. This can be explained as follows: For this study people were only asked to self-rate whether they felt »active and physically fit« (94 respondents) or »physically disabled« (17 respondents) (Fischer 2018). Therefore, it cannot be precluded that there is a certain sample bias with regard to the health status of the respondents.

Furthermore, having adult children was not included because approximately 90% of the respondents who have children stated that (in case care is needed) they would choose not to move in with their children, giving the following reasons: not wanting to become a burden to the child(ren) (Fischer 2018; Kolland et al. 2018), not willing to leave the familiar housing environment, maintaining one's independent lifestyle, lack of space in the adult child(ren)'s housing environment, cohabitation of the old and young does not do any good, the adult child(ren) live(s) nearby anyway or rather (still) in the respondent´s house(hold) (Fischer 2018).

The subject of multilocality or the relevance of having more than one place of residence could not be taken into account due to the number of missing values. This was because about 45% of the respondents did not provide any information on additional places of residence and another 47% of the respondents stated that they definitely do not have any second homes.

Furthermore, the »emotional attachment to the community« could not be included in the modelling, because this would have led to a very unstable estimation and some confidence intervals that would have ranged from 0 to infinity. This is particularly unfortunate, considering that 118 out of 121 respondents commented on this issue and emphasised its importance with regard to the choice of place of residence and subjective quality of life (Fischer 2018).

6 Conclusions

Firstly, it should be noted that predicting human behaviour is a (methodological) challenge *per se* (Sutton 1998) and the empirical results reported in this article should be understood as an attempt to identify relevant factors influencing residential mobility in later life. Given the data situation, this article presents a rare dataset on the predictors of residential migration in later life illustrated by the example of the Austrian small town Bruck an der Mur. Despite all methodological limitations, this study provides empirical insights into the intentions of the young-old in Bruck in the year 2017.

In terms of content, the findings align with those of previous related research, suggesting that gender and educational attainment are relevant factors for prospective residential mobility, particularly regarding changes in the municipality of residence. Surprisingly, in this sample neither the district nor the emotional attachment to the flat or house and garden seem to be relevant to the idea of leaving Bruck. Regarding ageing-in-place within one's home, or considering relocation in case care is needed, the modelling results indicate that the statistical significance of influencing factors (such as gender) depends on the choice of independent variables. Therefore, it is not possible to determine whether women or men have different attitudes towards relocating to a nursing home in the future, nor to what extent gender and duration of residence will influence residential mobility in later life.

Given the sample size, the number of observations included in the models and the lack of previous studies on the topic for small towns in Austria in general and particularly for Bruck, it is difficult to state whether the results are representative for the entire population aged 60 to 74 living in the case-study municipality.

However, these results provide a valuable starting point for further investigations on the factors influencing the residential mobility in later life and aging-in-place. Future studies could use quantitative cross-sectional or longitudinal exploratory pro- or retrospective research designs. This could involve conducting repeat surveys of people aged 60 to 74 and/or people aged 67 to 81 living in their home or in nursing homes in Bruck, or through panel studies. A more differentiated look should focus on individuals living alone and those with multiple residences.

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