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SOCIO-SPATIAL DIFFERENTIATION OF RESIDENTIAL SATISFACTION IN JELGAVA

SUMMARY OF DOCTORAL THESIS

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ANNOTATION

Place of residence forms an important part of inhabitants' quality of life. Most people both in the world and in Latvia inhabit cities. Therefore, it is especially important to study residential satisfaction in the context of distribution of population and its development, as well as analyse the characteristics used for assessment. Research into residential satisfaction plays an important role not only in the academic environment, but also in the planning of territorial development, infrastructure and service provision. Geographers explore the socio-spatial manifestations of residential satisfaction assessment, which is influenced by the urban space as well as the social composition of its inhabitants.

The aim of the dissertation is to assess the socio-spatial differentiation in the geographical diversity of residential satisfaction in a second tier city of Latvia. The research is based on in-depth studies of Jelgava city. Jelgava was selected for the study, because it provided an opportunity to assess the importance of studentification and the increase in the proportion of young people in the society in the context of the university city.

Based on the characteristics of the residential satisfaction assessment of the urban environment identified in previous studies, the author has identified the factors of the urban environment that affect the residential satisfaction assessment of the city's population. The study reveals the impact of various demographic, socio-economic, housing and migration profiles of the population. The results obtained in the course of the dissertation development confirmed the existence of certain correlations in the scale and location of the residential satisfaction assessment according to the morphological structure of the city. It was also found that there were differences in the residential satisfaction assessment of students and other city residents.

Keywords: residential satisfaction, second tier city, students, socio-spatial differentiation, Jelgava.

CONTENTS

INTRODUCTION

Topicality of research

Place of residence forms an important part of inhabitants' quality of life. Most people both in the world and in Latvia inhabit cities. Therefore, it is especially important to study residential satisfaction in the context of distribution of population and inhabitation development, as well as analyse the characteristics used for assessment. The attractiveness of a place of residence is revealed through the assessment given by the population, which is formed by various subjective and objective attributes (Amerigo, Aragones, 1997). Several authors have pointed out that creating attractive living spaces in cities is a strategic goal of sustainable development planning (Insch, Florek, 2010; Zenker et al., 2013). Therefore, the study of the attractiveness of the place of residence also has a practical role in the planning of territorial development, infrastructure and service provision (Fang, 2006).

Residential satisfaction assessment is influenced by the size of the settlement, the density of the distribution of population and the nature of the built-up area, as well as the geographical location, scale of the location and historical development (Elsinga, Hoekstra, 2005; Diaz-Serrano, 2006; Balestra, Sultan, 2013). Different groups of the population assess their place of residence differently. It is influenced by time spent in the place of residence, age of the assessor, social status and other characteristics (Speare, 1974; Fang, 2006). In geography, socio-spatial differentiation in residential satisfaction are explored by (1) analysing the location of the place of residence according to the morphological structure of the city and (2) the scale of research within housing, neighbourhood, or city (McCrea et al., 2005; McKerron, Mourato, 2009). In large, metropolitan cities, the composition of population and the morphological structure of the city are usually very diverse. This leads to greater differences between homes, quarters and neighbourhoods. Similarly, the size of a settlement in terms of its population and importance in the administrative hierarchy has a significant impact on the placement and quality characteristic to the places of residence (Du et al., 2017). At lower development levels of inhabitation structure, or in second and third tier cities, aspects of residential satisfaction have been studied less frequently.

The composition of population has a special role in the study of residential satisfaction. The choice of place of residence for different socio-demographic groups can vary greatly in both location and quality (Krabel, Flöther, 2014). Today, cities compete for young, talented inhabitants and prefer creative groups, well-educated professionals – the so-called creative class (Florida, 2006).

Consequently, university towns and cities are the focus of research on residential satisfaction, for example, exploring studentification processes (Grabkowska, 2011; Fabula et al., 2017). After graduation, a part of university alumni enters the local labor market, purchase housing and use the usual services for urban living. However, it should be noted that this population group is very mobile (Florida, 2006). Therefore, it is important to find out how students feel about living in the city and how satisfied they are with their place of residence (Inch, Sun, 2013). It can be an indicator to understand students' future intentions, as well as may point to the aspects of the city, which, if improved, can have a positive effect on attracting new talent to the city.

In Latvia, residential satisfaction has been studied both in the capital Riga (Bauls et al., 2003; Krūmiņš et al., 2018) and in other large cities, such as Rēzekne (Litavniece, Ežmale, 2012) and Daugavpils (Meņšikovs, 2006). So far, the spatial features of residential assessment have been analysed only in Riga (Bauls et al., 2003; Krūmiņš et al., 2018). In other cities of Latvia, geographical differentiation of the residential satisfaction has been little studied. Thus, the dissertation explores a current research topic, which, in addition to its relevance in the academic field, brings a substantial contribution to urban planners, helping to identify the factors that are important for different groups of people to ensure quality living in the city. Jelgava has been chosen as a research area as an example of a second tier city in Latvia, where no significant academic research has been conducted on the residential satisfaction. In addition, Jelgava, as a regional higher education centre with the Latvia University of Life Sciences and Technologies, offers favourable preconditions for studying students' residential satisfaction, which so far has been little explored in Latvia.

Novelty of research

- A model for the study of spatial differentiation of the residence has been developed, evaluating the scale and location of the residence in the city.
- The most important attributes influencing the assessment of the place of residence have been determined as a result of factor analysis.
- An analysis of geographical differentiation of residential satisfaction according to the morphological structure of the city has been completed.
- The residential satisfaction of different population groups has been assessed.

Aim of dissertation

The aim of the dissertation is to assess the socio-spatial differentiation of residential satisfaction in second tier cities.

Tasks of dissertation

To achieve the aim of the dissertation and assess the socio-spatial differentiation of residential satisfaction in Jelgava, the following tasks have been advanced:

- to identify and analyse theoretical approaches to residential satisfaction in second tier cities;
- to summarize the experience of previous empirical research on the factors influencing residential satisfaction assessment and its socio-spatial differences in cities;
- to describe the morphological development, social and spatial structure of Jelgava city, as well as the quality of its urban space;
- to establish set of factors determining residential satisfaction in Jelgava;
- to analyse the differences in the attractiveness of the place of residence in the assessment given different social groups of the city population;
- to assess the differences in residential satisfaction in different zones of the city.

Proposed theses

- The concept of residential satisfaction is considered in various fields of science. In geography, the residential assessment is related to the spatial differentiation of inhabitation structure development and the morphological structure of the city. Therefore, it is important to look for links between different scales of research and the location of residences in the city.
- In the current study, the residential satisfaction was determined according to several attributes, establishing the most important set of attributes or factors. Environmental quality and personal safety are important factors in the assessment by the population.
- Previous research reveals socio-demographic differentiation in the residential satisfaction. Therefore, the thesis provides an analysis of differences in the social composition of the population in the context of residential assessment. The results of the population survey enabled creation of socio-demographic profiles.
- The example of Jelgava is notable in the context of inhabitation structure development, as it reveals the socio-spatial features of residential satisfaction in the development centre of national and regional significance. The university located in the city attracts young students who are more critical in their assessment of the place of residence compared to older citizens living in the city for a long time. The choice of Jelgava allowed to assess the impact of demographic change in residential satisfaction assessment, as well as to look at the importance of studentization and increase in younger population in the context of the university city.

Approbation of research results

The results of the dissertation independently or together with co-authors have been presented in 9 scientific articles, as well as discussed in 16 international and local conferences.

Scientific articles:

1) **Feldmane L.** (2019). Students' Satisfaction with Their Host City: Case of Jelgava, Latvia. Proceedings of international scientific conference "Engineering for Rural Development", No. 18, 1888–1893. ISSN 1691-5976 (Web of Science, SCOPUS).

2) **Feldmane L.** (2019). Inner City or Outskirts: Where are Residents More Satisfied? The Case of Jelgava. "*Folia Geographica*" XVII. Appreciating Geography: Local and Global Scale, 131–138. https://doi.org/10.22364/fg.17.17

3) **Feldmane L.** (2018). The Impact of Residence Longevity on Life Satisfaction: The Case of Latvia Cities. New Challenges of Economic and Business Development – 2017: Digital Economy: Proceedings of Reports, the 9th International Scientific Conference; 18–20 May 2017, Riga, University of Latvia. ISBN 978-9934-18-344-7, 212–221 (Web of Science).

4) **Feldmane L.,** Apsīte-Beriņa E., Burgmanis Ģ. (2018). Apmierinātība ar dzīvi un ģeogrāfiskā mobilitāte: teorētiskais ietvars [Satisfaction with life and geographic mobility:

theoretical framework]. Collected articles in geography "*Folia Geographica*" XVI, Latvijas Ģeogrāfijas biedrība, ISSN 1407-5229, 102–108.

5) **Feldmane L.** (2018). Life Quality Assessment in the City of Jelgava. *Economic Science for Rural Development,* No. 48: Integrated and Sustainable Regional Development, Marketing and Sustainable Consumption, ISSN 1691-3078, 85–92 (Web of Science).

6) **Feldmane L**. (2017). Human Life Course Impact on Migration Patterns: The Case of Jelgava City, Latvia. *Economic Science for Rural Development,* No. 46: New Dimensions in the Development of Society, Home Economics, Finance and Taxes, ISSN 1691-3078, 62–67 (submitted to Web of Science).

7) **Feldmane L.** (2016). Apkaimes faktors dzīvesvietas izvēlē Jelgavas pilsētā [Neighbourhood factor in choosing the place of residence in Jelgava]. Collected articles in geography "*Folia Geographica*", No. 15, Latvijas Ģeogrāfijas biedrība, ISSN 1407-5229, 98–102.

8) Popluga D., **Feldmane L.** (2016). Development of Sustainable Living Environment in the Cities through the Bioeconomy. *Economic Science for Rural Development*, No. 41: Rural Development and Entrepreneurship, Bioeconomy, Home Economics. ISSN 1691-3078, 259–264 (Web of Science).

9) **Feldmane L**., Krisjane Z. (2016). Migration Towards Second Tier Cities in Latvia: The Case of Jelgava City. *Economic Science for Rural Development,* No. 42: Integrated and Sustainable Regional Development, Production and Co-operation in Agriculture, ISSN 1691-3078, 45–51 (Web of Science).

Participation in conferences:

1) The 3rd Riga Readings in Social Sciences (RRSS) Annual International Conference "15 years after the great enlargement – What is EU for?", University of Latvia, Riga, 14–15 November 2019. Report *Correlation between Residential Satisfaction and Intention to Migrate: Case of Jelgava*.

2) The 18th International Scientific Conference "Engineering for Rural Development", Latvia University of Life Sciences and Technologies, Jelgava, Latvia, 22–24 May 2019. Report *Students' Satisfaction with Their Host City: Case of Jelgava, Latvia*.

3) The 77th Scientific Conference of the University of Latvia, Faculty of Geography and Earth Sciences, section "Geographical Mobility, Demographic Challenges and Territorial Development", Riga, 01.02.2019. Report *Iedzīvotāju dzīves vietas pievilcības novērtējums sociālisma laika mikrorajonos: Jelgavas piemērs [Assessment of Residential Satisfaction in Housing Estates Constructed in Socialist Period: The Example of Jelgava]*. Completed theses.

4) The 9th International Scientific Conference "New Challenges of Economic and Business Development – 2018: Digital Economy", 18–20 May 2018, Riga, University of Latvia. Poster report *The Impact of Residence Longevity on Life Satisfaction: The Case of Latvian Cities*.

5) The 19th International Scientific Conference "Economic Science for Rural Development 2018" Jelgava, LLU ESAF, 09.05–11.05.2018. Report *Life Quality Assessment in the City of Jelgava*.

6) The 76th Scientific Conference of the University of Latvia, Faculty of Geography and Earth Sciences, Riga, 30.01.2018. Report *Latvijas lielo pilsētu iedzīvotāju apmierinātība ar personīgo dzīves līmeni [Satisfaction of Latvian Major Cities' Inhabitants with Personal Standard of Living]*. Completed theses.

7) The 18th International Scientific Conference "Economic Science for Rural Development 2017", 27.04–28.04.2017., Jelgava, LLU ESAF. Poster report: *Human Life Course Impact on Migration Patterns: The Case of Jelgava City, Latvia*.

8) The International Conference "Demographic challenges and urban development in post-social countries", 06.12.2016, Riga, University of Latvia. Report *Attraction of Second Tier City and Migration Patterns to It: The Case of Jelgava City, Latvia*.

9) International Conference "New Ideas and New Generations of Regional Policy in Eastern Europe", Pécs, Hungary, 07.04–08.04.2016. Report *The Portrait of Immigrant in the Secondary City: The Case of Jelgava*. Completed theses.

10) The 17th International Scientific Conference "Economic Science for Rural Development 2016", Jelgava, LLU ESAF, 21.04–22.04.2016. Report *Migration Towards Second Tier Cities in Latvia: The Case of Jelgava City* (co-author: Krišjāne Z.).

11) The 17th International Scientific Conference "Economic Science for Rural Development 2016", Jelgava, LLU ESAF, 21.04–22.04.2016. Report *Development of Sustainable Living Environment in the Cities Through the Bioeconomy* (co-author: Popluga D.).

12) Latvijas Ģeogrāfijas kongress [Geography Congress of Latvia], Riga, 18.03–19.03.2016. Report: *Apkaimes faktors dzīvesvietas izvēlē Jelgavā [The Factor of Neighbourhood in Choosing the Place of Residence in Jelgava]*.

13) The 74th Scientific Conference of the University of Latvia, Faculty of Geography and Earth Sciences, 03.02.2016. Report: *Iedzīvotāju pārcelšanās tendences uz Jelgavu [Patterns of Inhabitant Migration to Jelgava]*. Completed theses.

14) Sussex Migration Graduate Conference 2016, Sussex University, 14.03–15.03.2016. Report *Attraction of Medium-Sized City and Migration Patterns to It: The Case of Jelgava City, Latvia*.

15) The 15th Ernestas Galvanauskas' International Scientific Conference, Siauliai University, 26.11.2015. Report *Bioeconomy as Effective Tool for Ensuring Qualitative Living Environment in the Cities* (co-author: Popluga D.).

16) Riga Technical University 56th International Scientific Conference, Riga, 14.10.2015, section "Architecture and Urban Planning". Report: *Assessment of Urban Living Environment in Different Human Life Course Stages*.

Participation in research projects:

1) Reasearcher, National Research Programme "Economic Transformation, Smart Growth, Governance and Legal Framework for Sustainable Development of State and Society – New Approaches to Building a Sustainable Knowledge Society" (EKOSOC-LV), project No. 5.2.4 "Renewal of society through reducing the risk of depopulation, through demographic development and strengthening links with the diaspora for the transformation of the Latvian economy"researcher.
2) Reasearcher, National Research Programme "Latvian Heritage and Future Challenges for the Country's Sustainability", project No. VPP-IZM-2018/1-0015 "Towards sustainable development and inclusive society in Latvia: response to demographic and migration challenges" (DemoMig)".

1. CONCEPT OF RESIDENTIAL SATISFACTION IN GEOGRAPHY

In geography, **residential satisfaction** (at times also termed "housing satisfaction") is associated with an assessment of an individual's place of residence and viewed as an accurate guide to what the respondents really feel about their residence (Parkes et al., 2002; Fang, 2006). Moreover, residential satisfaction is recognized as an important component of individuals' general quality of life (Lu, 1999). The concept is extensively used in research of urban social space (e.g., Elsinga, Hoekstra, 2005; Adriaanse, 2007; Dekker et al., 2011; Herfert et al., 2012; Kahrik et al., 2012; Hanak et al., 2015; Spackova et al., 2016; Barreira et al., 2017; Gorczyca, Grabinski, 2017; Boschman, 2018). **Residential satisfaction** is studied in various fields of science. It is a multidimensional, complex construct as its precise meaning depends on the place, time and purpose of assessment and on the value system of the assessor (Mohit, Al-Khanbashi Raja, 2014) The authors Amerigo and Aragones (1997) point out that residential satisfaction is also influenced by an individual's emotional state, sense of place and attachment to the residential environment. On the other hand, some authors (for example, Lu, 1999) apply this concept to denote the complex construct of perception of residence and the cognitive process that influences this perception. In the dissertation, residential satisfaction is the assessment of the place of residence given by the residents living in the research area according to certain attributes. In the relevant literature, the attributes influencing residential satisfaction most frequently are divided into **objective** and **subjective** attributes (Galster, 1985; Weidemann, Anderson, 1985; Speare, 1974; Amerigo, Aragones, 1997). The objective ones consist of **environmental** attributes (housing, environment, including neighbourhood, city, and society), as well as characteristics of the **individual** and **households** (e.g., age, gender, stage of life course, previous residential experience). Subjective features, on the other hand, are more difficult to explain because they include individual's emotions, expectations, and values.

Residential satisfaction studies generally represent one of two directions: (1) studies on the assessment of residence in the wider context of human quality of life, and (2) studies on the assessment of residence in the context of population mobility, where residential satisfaction is a catalyst for residents' migration behaviour (Amerigo, Aragones, 1997). Residential satisfaction studies in the context of population mobility emphasize that the lower the current residential satisfaction, the greater the willingness to move (Gentile, 2005; Nowok et al., 2018; Coulter, Scott, 2015; Spackova et al., 2016). In the current dissertation, residential satisfaction is studied in relation to the quality of life in the city. A high residential satisfaction means positive emotions, a place of residence that meets the wishes of the resident and a corresponding assessment. In such situations, the desideratum corresponds to the actual both in terms of the desired place of residence and in the choice of existing housing, amenities and the environment (Lu, 1999). Reverse situations most often lead to a low assessment of the place of residence.

In geography, cities are often studied in the context of **system of inhabitation structure development** (Roberts and Hohmann, 2014). Systems of population can be viewed globally or locally. The global city network is a system of population formed by certain links between the settlements of this network (e.g. Campagni, Capello, 2016). The settlements that are most connected with other settlements are placed hierarchically higher. Hierarchically, there are the first and the second tier cities, as well as lower tier cities and

places with less-developed inhabitation structure. The first tier cities usually are the administrative, economic and population centres (Markusen et al., 1999). The second tier cities most frequently are associated with some functional specialization and regional level of government (Parkinson et al., 2012).

2. RESEARCH QUESTIONS

Exploring the residential satisfaction in urban environment is an interdisciplinary topic addressed by researchers representing various specialisations throughout the second half of the 20th century and the beginning of the 21st century. Their works consider a wide range of attributes shaping residential satisfaction, starting with the psychological assessment of the individual and ending with the geographical location of the place of residence (Amerigo, Aragones, 1997). Although researchers generally are mainly interested in large cities, as various social processes tend to be more pronounced therein, second tier cities, which are usually regional centres of development in the inhabitation structure, are also becoming increasingly prominent in research. Likewise, empirical research dedicated to residential satisfaction increasingly extends its focus beyond capitals (Spackova et al., 2016; Herfert et al., 2012; Kahrik et al., 2012; Kovacs, Herfert, 2012; Temelova, Dvorakova, 2012), also viewing medium-sized and second tier cities (e.g., Gentile, 2005; Dekker et al., 2011; Permentier et al., 2011; Hanak et al., 2015; Barreira et al., 2017; Gorczyca, Grabinski, 2017; Barreira et al., 2019; Bielecka, 2018). In Latvia, the research dedicated to urban residential satisfaction is scarce and mainly selects the capital Riga as the research area (Bauls et al., 2003; Krūmiņš, Sechi, Bērziņš, 2018). However, some studies have also assessed this phenomenon in second tier cities, such as Daugavpils (Meņšikovs, 2006) and Rēzekne (Litavniece, Ežmale, 2012). Residential satisfaction assessment in Latvian cities has come to the attention of the Central Statistical Bureau, resulting in a study on the quality of life in cities (Central Statistical Bureau, 2017). According to the aim of the research, several research questions have been advanced in the dissertation:

Question 1: *What attributes and factors characterise residential satisfaction in second tier cities?*

Studies confirm that residential satisfaction is simultaneously influenced by a complex set of indicators: characteristics of both the area around the place of residence and the population (e.g. Galster, 1985; Weidemann, Anderson, 1985; Speare, 1974; Amerigo, Aragones, 1997; Lu, 1998). As pointed out by Fang (2006), awareness of such indicators, which affect residents' satisfaction or dissatisfaction with their place of residence is an essential precondition for successful sustainable urban development, as it contributes to understanding the characteristics of the urban environment that should be improved to make it attractive to residents. Therefore, the first research question pertains to the features that determine residential satisfaction assessment in the city.

Research in the first decade of the 21st century (e.g., Pacione, 2003; McCrea et al., 2005) has linked modern and attractive urban space primarily to economic growth, such as job opportunities, living costs, and urban provisioning services. However, the researchers already emphasized that in the future, the quality of the environment will play an increasingly important role in the attractiveness of cities. It has become one of the defining attributes of the urban space quality in the second decade of this century. Previous research exploring residential satisfaction in cities (e.g., McCrea et al., 2005; Permentier et al., 2011; Bauls et al., 2003; Yin et al., 2018; Kahrik et al., 2016; Litavniece, Ežmale, 2012; Adriaanse, 2007; Hanak et al., 2015; Barreira et al., 2017; Chhetri et al., 2011) confirms

that the most important preconditions for satisfaction with housing include 1) environmental quality and facilities, proximity to green areas, 2) level of amenities available at the location of the place of residence, for example, public transport, proximity to shops, school and other public amenities, 3) public life in the vicinity of the place of residence, good neighbourly relations or social climate, and 4) physical condition and amenities of the housing. Likewise, important factors encompass the safety in the vicinity of the place of residence (Weziak-Bialowolska, 2016; Hanak et al., 2015; Barreira et al., 2017), the overall image of the neighborhood in the public perception (Yin et al., 2018), as well as the overall living costs (McCrea et al., 2005). The study of Rēzekne (Litavniece, Ežmale, 2012), in turn, indicates that the attractiveness of urban space is also characterized by the quality of information and communication technologies and their availability.

In order to answer this research question, the survey developed under the auspices of the dissertation asked Jelgava residents to assess 14 different attributes of urban space in Jelgava, including the availability of public transport and retail stores, air quality and safety. In the course of the research, the method of factor analysis was used to establish the attributes that most significantly affect residential satisfaction assessment in this city.

Question 2: *How do different groups of residents assess the attractiveness of the place of residence?*

Different groups of residents assess habitats differently, as evidenced by a number of previous studies (e.g., Speare, 1974; Adriaanse, 2007; Lu, 1999; Fang, 2006; Balestra, Sultan, 2013; Elsinga, Hoekstra, 2005; Diaz-Serrano, 2006). This assessment is also significantly influenced by population characteristics such as age, marital status, type of housing or dwelling length at the place of residence. Recent research trends in this area show that groups of individuals and households are compared separately not only in terms of their objectively measurable socio-demographic indicators, but also in terms of their subjective indicators of satisfaction, such as satisfaction with life in general or financial situation (Balestra, Sultan, 2013).

In order to answer this question, the factor analysis method was used to identify the factors that most significantly affect residential satisfaction assessment in this city. The defined determinants of residential satisfaction were compared among different groups of respondents according to their attributes most frequently described in the literature, such as age (Permentier et al., 2011; Lu, 1999; Gentile, 2015), gender (Parkes et al., 2002; Weziak-Bialowolska, 2016), marital status (McCrea et al., 2005; Dekker et al., 2011; Balestra, Sultan, 2013), household financial status (Boschman, 2018; Lu, 1999), tenure (Speare, 1974; Parkes, Kearns, Atkinson, 2002; Diaz-Serrano, 2006) and dwelling length (Fang, 2006; Inch, Florek, 2010; Baum et al., 2010), which were combined in the following groups of indicators: demographic indicators, socio-economic indicators, indicators characterising the place of residence, migration experience and place attachment.

Question 3: *How do students assess residential satisfaction during their studies in the university city? Are there differences in residential satisfaction assessment compared to other population groups?*

When classifying the social groups of Jelgava residents, it was established that students of the Latvia University of Life Sciences and Technologies located in Jelgava play an important role in the social structure of the city. Given that a highly educated population is one of the most important preconditions for the economic development of any territory (Krabel, Flother, 2014; Sokolowicz, 2018), it is important for the university city to encourage graduates to remain permanently in the city of their studies, which can have a positive impact on future socio-spatial processes in the city. To this effect, one of the conditions is to create a positive impression among the students of their study period and the city in which they study. It should be taken into account that the study selection process does not concern solely the assessment of the curriculum on offer, but also involves the city space outside the study premises (Roostika, 2017). According to research, satisfied students not only achieve higher academic results (El-Hilali et al., 2015), but also, through positive experience, promote the attraction of new students to the respective higher education institution (Insch, Sun, 2013). In turn, the increase in the number of students has a positive impact on the city's economy, as it creates demand for new services particularly adjusted for students, thus generating a need for new jobs (Fabula et al., 2017). Consequently, the trends indicate that cities are increasingly competing with each other to attract more and more students and professionals, including those coming from abroad.

In Latvia, research focused on student satisfaction indicators has been conducted mainly to identify subjective assessment of social and economic living conditions (Eurostudent VI, 2017) or satisfaction with the university's physical environment (Licite, Janmere, 2018). At the same time, there is a lack of research on student satisfaction with the city in which they study. Researchers abroad have dedicated more attention to this topic, mostly confirming that the university city plays an important role in student satisfaction with their time of studies (Roostika, 2017; Insch, Sun, 2013; Fleuret, Prugneau, 2015; Wesselmann, 2019). Empirical studies have also shown (Inch, Sun, 2013; Wesselmann, 2019) that students consider housing, socialization, safety and cultural opportunities to be the most important attributes of a university city, but overall satisfaction with the city is most significantly influenced by shopping and catering, environmental attractiveness, orderliness, as well as dynamics, public transport, socialization opportunities. In addition, student satisfaction with the university city is often associated with research on the building the image of university cities and the field of urban marketing (Roostika, 2017).

Thus, for the first time in Latvia, on the basis of survey data of Jelgava residents, it is established how students who come from other territories feel in the university city and how they evaluate various urban environment factors in the city which they have chosen as a place to acquire higher education. Residential satisfaction assessment also includes comparison between several marginal groups of respondents – young people of the same age group who have lived in Jelgava before and have no migration experience, as well as seniors, who are traditionally considered the most satisfied part of society (Galster, 1987; Speare, 1974; Permentier et al., 2011; Dekker et al., 2011).

Question 4: *How does residential satisfaction differ at different scales of residential research and in different zones of the city?*

Geographic studies allot importance to considering individuals' behaviour and attitudes in a spatial context, since even early studies have revealed a link between spatial behaviour and social order (Baldassare, 1978). According to Edward Soja's (Soja, 1980) social-spatial dialectic, not only the people are the ones to create space and adapt it to their needs, but space also influences the actions and behaviour of individuals. Spatial distance is considered to be one of the most important factors influencing the quality of life, as it can affect the availability of services and infrastructure (Knox, Pinch, 2010), thus also impacting the satisfaction of the population with their place of residence.

Using the data of the Jelgava population survey, the study proposed a model of the residential satisfaction research scales and spatial differentiation (Figure 1), and for the first time in one of Latvia's second tier cities residential satisfaction is analysed in two different spatial dimensions – 1) spatial units at a distance from the individual's place of residence and 2) in different zones of the city.
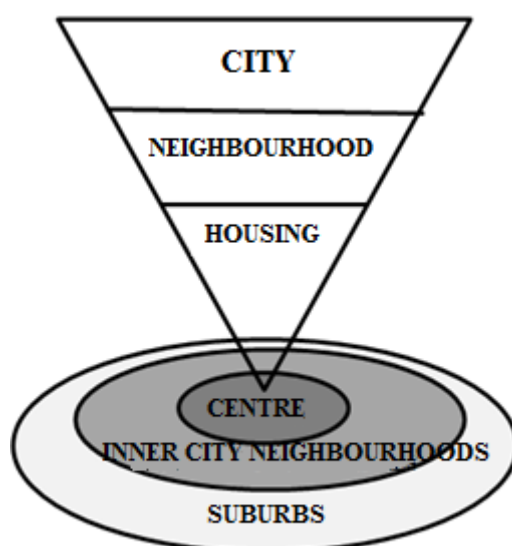
Source: created by the author based on the analysis of scientific literature

Figure 1. **Residential satisfaction research scales and spatial differentiation model**

Analysing the first dimension, previous studies indicate a tendency for residential satisfaction to vary between urban domains at different levels of scale (McCrea et al., 2005). Research shows that the individual most often gives a more positive assessment of the surroundings closest to him / her, such as the place of residence and surroundings, more positively, but as the scope of research expands, satisfaction with it decreases (Altman, Werner, 1985; Boschmann, 2018; Fleury-Bahi et al., 2008; Hur , Morrow-Jones, 2008; Permentier et al., 2011; Węziak-Białowolska, 2016). This is associated with a closer sense of belonging to a space closer to oneself, which is more familiar, and is one of the positively correlated indicators of the residential satisfaction assessment (Fleury-Bahi et al., 2008). The dissertation distinguishes two geographical research scales – the nearest research scale – the place of residence and its immediate surroundings, – and the city or the

remotest research scale, and compares the satisfaction of Jelgava residents with these scales of residential research.

Urban space is not homogeneous in morphological structure, and it is usually possible to distinguish smaller spatial units with different factors influencing the quality of urban space. Although some authors (e.g., McCrea et al., 2014) believe that residential satisfaction assessment usually does not reveal spatial relationships within the city or between different zones of the city, which is due to the fact that residents mostly choose their places of residence in such neighbourhoods, where meeting of their most important needs is ensured. However, a large number of studies on residential satisfaction (Cordera et al., 2019; Speare, 1974; Kovacs, Douglas, 2004; Lu, 1999; Jokela et al., 2015) have revealed certain spatial relationships in urban space, suggesting that the spatial impact on residential satisfaction should be taken into account.

Jelgava territory development planning documents do not distinguish city level territorial units or neighbourhoods. Therefore, according to the morphological structure and functional significance, three city zones are considered separately – the Centre, High-rise housing estates and Low-rise built-up area. Such a classification is frequently used in the works of other authors both in Latvia and elsewhere in the Baltic states, as well as in Central Europe (Ruoppila, 2004; Temelova et al., 2011; Marcinczak, 2012; Kovacs, Herfert, 2012; Spackova et al., 2016; Krūmiņš et al., 2018).

Respectively, the survey data of Jelgava residents are also classified according to the place of residence of the respondents. The city centre in each city is traditionally considered to be the most prestigious and part of the city that is best provided with public services (Temelova, Dvorakova, 2012), attracting residents who care not only about the quality of the environment and housing, but also the proximity of various public services and administrative institutions to their place of residence (Kahrik et al., 2016). High-rise housing estates are often considered to be less attractive places to live, they have a negative reputation and a lack of quality public services (Beckhoven and Van Kempen, 2006; Dekker et al, 2011). At the same time, other researchers (Gnattiuket, Kryvets, 2018; Herfert et al., 2012) emphasize the positive aspects of these neighbourhoods – they exhibit a great social and socio-economic diversity, which is considered a positive precondition for the neighbourhoods to avoid degradation. Another advantage of these estates is that they offer relatively cheap housing (Kovacs, Herfert, 2012). Additionally, a large proportion of the population considers them attractive for living (Herfert et al., 2012; Gnatiuk et al, 2018). Suburbs with predominantly low-rise built-up areas, lower population density and more green areas, also offer attractive places of residence, despite lower levels of service provision (Temelova, Dvorakova, 2012). Previous research confirms the attractiveness of low-rise residential areas on the suburban outskirts of the city (Lu, 1999; Adams, 1992; Spackova et al., 2016). However, it is sometimes the availability of services and the development of social infrastructure that is lower here, compared to the city centre and high-rise housing estate neighbourhoods (Spackova et al., 2016; Kahrik et al., 2012; Cordera et al. 2019). Other authors have found (for example, Jokela et al., 2015) that the most satisfied are the residents of the city centre, followed by those living in suburbs, while the lowest level of satisfaction is shown by those inhabiting the inner-city neighbourhoods, further from the residents of city centre. Studies that have found that the residential satisfaction is higher among the population living in the city centre (Du et al., 2017; McKerron, Mourato, 2009; Gentile, 2005), mainly link this phenomenon to the

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better provision of infrastructure. On the other hand, studies on residential satisfaction in high-rise housing estates reveal that the population generally gives these estates a positive assessment (Herfert et al., 2012; Gnatiuk et al., 2018; Kabisch, Grossmann, 2013; Kovacs, Herferts, 2012). Moreover, in some cases they receive even higher assessment than other parts of the city (Kovacs, Douglas, 2004; Gentile, 2005), although the results differ in different social groups of the population. Diverse trends in residential satisfaction assessment that vary between different parts of the city can be explained by the different priorities of residents in their choice of housing (McCrea et al., 2014), thus the spatial aspect of residential satisfaction cannot be considered in isolation from social composition of population in the urban zones.

3. RESEARCH DATA AND METHODS

3.1. Research data

The following secondary data allowed to ascertain the morphological development of the city in Jelgava, its social and spatial structure:

- Data from the Central Statistical Bureau of Latvia, including data from the 2011 census;
- Republic of Latvia Ministry of Education and Science "Report on Latvian Higher Education";
- Sources of Ģ. Eliass Jelgava History and Art Museum and local history materials of Jelgava Library;
- Jelgava city territorial development planning documents;
- Data of Jelgava City Municipality, including those of its subordinate institutions;
- Data published in the population survey "Quality of Life in Cities" conducted by the Central Statistical Bureau in 2017.

The quantitative survey method was selected in the framework of the study, employing a questionnaire, which is usually used when the secondary data do not provide information that is sufficient for the requirements of the study (Clifford et al., 2010). The survey was implemented in several stages:

- **Stage 1.** In June 2018, a population survey was conducted in the city of Jelgava. A total of 475 respondents were interviewed at this stage.
- **Stage 2.** In July 2018, a population survey was conducted online. The survey questionnaire was entered electronically in the *google.com* standard survey template and a link to it was posted in *Facebook* Jelgava ad groups, which are aimed at both Latvian and Russian audiences. In total, 217 completed questionnaires were obtained electronically.
- **Stage 3.** At the end of November – beginning of December 2018, a face-to-face survey of students studying at different faculties and living in Jelgava during their studies was conducted at the Latvia University of Life Sciences and Technologies, which is the principal higher education institution in this city and Zemgale region. A total of 269 students were surveyed, which is approximately 6.4% of all students attending the Latvia University of Life Sciences and Technologies.

The questionnaire researching the living and operational space of the population is based on a previously approbated structure and consists of several interrelated groups of questions and a total of 14 questions with subsections. The questionnaire consists mainly of closed-ended multiple-choice questions, as they have several advantages over open-ended questions: they make it easier for the respondent to answer, as well as facilitating the processing of responses with statistical methods and interpretation in the data analysis process due to the limited number of responses in multiple choice answers (Clifford et al., 2010).

The introduction to the questionnaire includes questions related to the characteristics of the respondents' current residence in Jelgava, followed by questions about the respondents' previous experience of migration or change of residence. The next group of

questions includes issues related to the respondent's subjective assessment of the place of residence and the Jelgava urban space and the sense of attachment to this city. The questions for assessing residential satisfaction were formed according to one of the methods most commonly used in population surveys to determine the attitude of respondents – Likert scale 5-point systems, where "1" corresponds to "very dissatisfied" and "5" – to "very satisfied", while a value of "3" denotes a neutral rating.

Likert's 5-point scale was also used to assess the respondents' sense of attachment to Jelgava, where "1" corresponds to "completely unattached" and "5" – "entirely attached". These are followed by questions related to future intentions regarding the change of residence, as well as questions that characterize the trajectories of the respondents' living space – location of their place of work or studies, the different types of services that they use. The satisfaction group of questions is concluded with questions about satisfaction with life in general, life in Jelgava, as well as the financial situation of the household. The demographic and socio-economic issues characterizing the respondents are included at the end of the questionnaire, encompassing age, marital status, nationality and education.

A total of 961 questionnaires were completed in the survey. The age structure of the respondents was influenced by the number of respondents studying in Jelgava, as a result of which more than half of the survey data set were young people aged 18–34. From the total sample of the survey, 269 respondents were students studying at the Latvia University of Life Sciences and Technologies, 192 of whom came to study in Jelgava from other Latvian cities and rural areas, while 77 of the students had previously lived and still live in this city. Since student satisfaction with the university city in Latvia had not been studied previously, in the framework of the current thesis students were selected as one of the groups to be studied. Taking into account that the migration event and the quality of the previous place of residence can significantly influence the assessment of various subjective areas of life, including the current place of residence, students with migration experience, who had arrived to Jelgava from another territory (n=192) were chosen as the target group for data analysis. The main comparative population groups were selected on the basis of two profiles created during the study, representing respondents with opposite views – one who was most satisfied, and another – most dissatisfied with life in Jelgava. The selected comparative population groups are students and young people without migration experience (n=259), as well as seniors (n=100), who are traditionally considered to be the most satisfied part of society.

3.2. City zones included in research area

When analysing residential satisfaction in urban space, it is important to look at its internal structure to determine whether spatial aspects affect the subjective residential satisfaction assessment. The city of Jelgava planning documents do not indicate smaller territorial units, since the structure of this city can be described as monocentric. However, the historical development of the city and the changes of the political order have created certain features in the Jelgava city space, as a result of which several different city zones have been singled out within the dissertation – the Centre, High-rise housing estates and Low-rise built up areas. The definition of city zones is based on the historical development

of the territory, the type of buildings dominant in the area and functional use of the territory.

The identified city zones – the Centre, High-rise housing estates and Low-rise built up areas – were used as a basis for analysing the residential satisfaction assessment in Jelgava in a spatial context. In order to structure the data of the population survey conducted within the framework of the dissertation into smaller spatial units, the respondents have been asked to indicate their place of residence in the urban space, choosing from the most characteristic and recognizable neighbourhoods, which are also used in everyday language of Jelgava inhabitants and which can be further applied in classification of city zones.

3.3. Data processing methods

As a result of the survey conducted within the framework of the doctoral thesis, the Jelgava population survey data array was obtained, which, in addition to traditional data processing and analysis methods, such as descriptive statistics, was also processed with econometric data analysis methods.

Since the total number of characteristic attributes of urban premises analysed in the Jelgava population survey conducted within the framework of the current dissertation is sufficiently large, and thus the processing becomes more complicated, it was decided to reduce their number by determining the factors influencing residential satisfaction assessment to be used for further survey data analysis. In order to establish which factors of urban space influence the Jelgava residents' residential satisfaction assessment, **factor analysis** was primarily chosen, using the principal component analysis, while the Varimax rotation was used for more complete interpretation of factors, which is recognized as the best orthogonal rotation (Adriaanse, 2007; Tabachnick, Fidell, 2013). Factor analysis is a method of statistical analysis employed as a reduction method to reduce an array of data with many variables to a smaller, more manageable size. When many of original variables are highly correlated, it is possible to reduce the original data from a large number of original variables to a small number of underlying factors (Rogerson, 2001). The principal component analysis is used when the researcher does not want to include all the variables in the analysis, but still wants to use the information contained in these variables (Adriaanse, 2007). Factor analysis as a data processing method has also been applied in previous studies involving residential satisfaction assessment in cities of Latvia (Bauls et al., 2003; Litavniece, Ežmale, 2012). 14 urban space attributes were used in the research in order to explain the factors: public transport, healthcare, sports facilities, cultural facilities, condition of streets and buildings, public places (e.g. markets, squares, pedestrian areas), green areas, availability of retail stores, educational institutions, air quality, noise levels, orderliness, safety and job opportunities. However, in the process, using **regression analysis**, it was found that the inclusion of certain urban space attributes – retail shops, educational institutions, condition of streets and buildings, as well as job opportunities – was not expedient, as they did not sufficiently explain residential satisfaction regarding Jelgava (impact values below 0.4) and were therefore excluded from the set of factors.

Given that the factor analysis determined the factors influencing residential satisfaction assessment, the following research progress no longer included analysis of

individual attributes of residential attractiveness (e.g. air quality, noise level, green areas), but instead focussed on the factors influencing residential satisfaction assessment. In order to analyse the data and apply other statistical data processing methods in the further analysis, new variables were created in the data array, which were calculated as average values in a 5-point system from the urban space attributes included within each factor as a result of factor analysis.

In order to determine, whether there are statistically significant differences in residential satisfaction assessment of different population groups, it was first examined, whether the data of the Jelgava population data array concerning residential satisfaction assessment correspond to the normal distribution, by using the **Kolmogorov-Smirnov Test**. As a result of data processing, it was found that the data did not correspond to the normal distribution. Since Likert scale data are generally perceived in the scientific literature as ordinal data (Clifford et al., 2010), consequently, non-parametric data processing techniques were used for further data analysis. To ascertain the statistical difference of residential satisfaction assessment data between 4 different groups of indicators – demographic indicators, socio-economic indicators, indicators pertaining to migration experience, as well as housing and place attachment – characterising the respondents, the **Kruskal-Wallis H Test** was applied. This test is used to determine whether the characteristic attributes belong to the same distribution in cases when the majority of attributes characterising respondents exceed two (Robinson, 1998). The calculated H value is compared with the critical value of H_c and, if H is equal to or greater than H_c, the value of p is obtained. In geographic studies, a result is considered statistically significant if the value of p is less than or equal to 0.05 (Lindsay, 2006).

Within the framework of the study, the differences in the assessment of the respondents' residential satisfaction were also analysed from the spatial perspective, separately distinguishing two dimensions. The first dimension analyses the data regarding the scales of the place of residence viewed in the study, comparing the satisfaction of the population with the nearest place of residence – housing and the immediate surroundings – and the most remote or city scale. The second dimension pertains the assessment of the factor influencing residential satisfaction in each of the three city zones identified in the study – in the Centre, High-rise housing estates and Low-rise built up areas. single factor analysis of variance **(ANOVA) Tukey HSD Test** was used to determine whether there were differences between the mean values of the residential satisfaction assessment provided by inhabitants living in different zones of the city. All survey data array preparation and calculations were performed using IBM SPSS Statistics 25 software.

4. RESEARCH RESULTS AND DISCUSSION

4.1. Factors impacting residential satisfaction in a city

The results of the factor analysis have revealed that residential satisfaction assessment in Jelgava is determined by three factors, whose determining attributes explain 59.1% of the information (Table 1).

Table 1. Factors impacting residential satisfaction

Factor	Explained information, %	Determining attributes	Factor weight of attribute
1. Environmental quality and personal safety	37.8	Noise level	0.834
		Air quality	0.774
		Safety	0.608
		Orderliness	0.609
2. Infrastructure	11.1	Public spaces	0.738
		Green areas	0.702
		Cultural facilities	0.662
		Sports facilities	0.609
3. Healthcare and transport	10.2	Public transport	0.773
		Healthcare	0.731

Notes: Analysis of the main components, Varimax rotation

Source: created by the author on the basis of Jelgava population survey data

Similarly to the study of residential satisfaction in different districts of Riga (Bauls, Krišjāne, Mežciema, 2003), where it was found that the most important factor influencing residential satisfaction is the quality of the environment, amenities and orderliness, Jelgava residents also recognise the quality of environment as the most important factor influencing residential satisfaction, while the infrastructure of the city that is necessary in daily life is perceived as significantly less important in the overall residential satisfaction. These results are also in line with the trend reported in the literature (Pacione, 2003; McCrea et al., 2005), noting that in the residential satisfaction assessment the population is gradually moving from economic to environmental quality indicators. This means that maintaining a high quality of the environment must be a priority for every city to ensure that its inhabitants feel good in the city. This result can also be explained by the fact that, in contrast to large cities, the availability of infrastructure and services is generally greater in the second tier cities, therefore the orderliness and quality of the environment in the perception of the inhabitants of these cities pushes the importance of infrastructure availability to the background. According to the residents of Jelgava, residential satisfaction assessment is significantly influenced by safety in the place of residence, and similar results have been found in studies of other countries (Hanak et al, 2015; Weziak-Bialowolska, 2016). Although the provision of infrastructure public space in the opinion of Jelgava residents affects the overall residential satisfaction to a lesser extent than the quality of the environment and personal safety, such leisure attributes of the urban environment as the availability of cultural and sports facilities have an impact on satisfaction with urban space. The availability and quality of public transport, similar to findings of the studies on other European cities (Weziak-Bialowolska, 2016; Hanak et al, 2015) also has an impact on individual's satisfaction or dissatisfaction with the city as a

whole, but this impact is relatively small. This could be due to the specifics of the second tier city – shorter distances in the city and more compact morphological structure, as a result of which the use of public transport is relevant for a small part of the city's population, because daily distances are suitable for travelling on foot.

4.2. Environmental quality and personal safety (Factor 1)

The survey of Jelgava residents conducted within the framework of the doctoral thesis identified environmental quality and personal safety as one of the determining factors influencing the residential satisfaction assessment. This factor is characterized by such features as noise level, air quality, orderliness and safety. In general, its rating in Jelgava city is moderately high, and the average rating given by respondents is 3.69 out of 5. Respondents rate the noise level in the city the lowest of the components of this factor (average rating 3.48 out of 5), while Jelgava's orderliness rating is the highest in this factor (average rating 3.88 out of 5).

As demonstrated by the results (Table 2), the demographic indicators characterizing the respondents are not decisive in the assessment of this factor, because of them only the age of the respondents has a statistically significant impact on the assessment of this factor in Jelgava. The lowest ratings to the quality of the environment and personal safety were given by the respondents under the age of 34, while they were significantly higher for the population over the age of 65, which can be explained by the general tendency of young people to be more critical in the assessment of their environment (Speare, 1974; Lu, 1999; Galster, 1987; Dekker et al., 2011; Boschman, 2018).

Among the socio-economic indicators characterizing the respondents, occupation, satisfaction with the financial situation and satisfaction with life in general have an impact on the assessment of the quality of the environment and personal safety. The lowest evaluation of this factor was given by persons who were studying at the time of the survey, while the highest evaluation was returned by respondents who indicated that they worked. This factor was rated significantly higher by persons who expressed satisfaction with the financial situation of their household, compared to respondents who were not satisfied with it. Respondents who were satisfied with life in general also gave a significantly higher rating to this factor of residential satisfaction. This confirms the relationship (Fleuret, Prugneau, 2015) that overall subjective satisfaction with life affects satisfaction with different areas of life, including place of residence, as people who are generally satisfied with life less frequently tend to assign negative traits to various spheres of life.

The survey data show that the residents who have lived in their place of residence for a long time, value the quality of the environment and personal safety higher than the persons who have come to the place of residence relatively recently. This can be explained by an increase in the place attachment and acceptance of the environment (Inch, Florek, 2010; Baum et al., 2010), as well as by the loss of comparative criteria for assessing the residential satisfaction after long-term residence in the same place. Similarly to the studies of other authors (Speare, 1974; Lu, 1998), the results of the Jelgava resident survey indicate a close connection between the future intentions of migration and the assessment of the quality of the environment and personal safety in this city.

Table 2. **Assessment of environmental quality and personal safety (Factor 1) according to the indicators characterizing respondents and households**

		Average value	Kruskal-Wallis value H	df	*p*
Demographic profile					
Gender	Male	3.71	0.419	1	0.518
	Female	3.68			
Age	18–34	3.65	8.184	2	0.017*
	35–64	3.70			
	65 and above	3.86			
Nationality	Latvian	3.68	0.275	1	0.600
	other	3.71			
Marital status	lives alone	3.70	0.347	1	0.556
	married or in cohabitation	3.67			
Children living in household	yes	3.71	1.169	1	0.280
	no	3.67			
Socio-economic profile					
Education	basic	3.64	3.370	1	0.338
	general secondary	3.63			
	professional secondary education or vocational education	3.67			
	higher	3.74			
Occupational status	employed	3.76	15.234	3	0.002*
	unemployed	3.68			
	studying	3.53			
	employed and studying	3.69			
Satisfaction with financial situation	satisfied	3.84	60.220	1	0.000*
	others	3.44			
Overall satisfaction with life	satisfied	3.75	23.387	1	0.000*
	others	3.40			
Migration experience					
Duration of living at the place of residence	recently migrated	3.58	19.446	1	0.000*
	long-term residents	3.77			
Plans regarding migration	plan to move	3.50	16.910	1	0.000*
	others	3.74			
Housing and place attachment					
Type of housing	apartment	3.70	15.056	2	0.001*
	detached house, terraced house	3.76			
	dormitories	3.52			
Tenure	owned	3.73	9.629	1	0.002*
	rented	3.61			
Place attachment	attached	3.80	67.142	1	0.000*
	others	3.38			

* – statistically significant difference (p<0.05)

Source: created by the author on the basis of Jelgava population survey data

According to the results of the study, the indicators characterizing housing also have an impact on the assessment of the quality of the environment and personal safety in the city. There is a statistically significantly lower assessment of environmental quality and personal safety among the residents living in dormitories. This factor received a lower rating from the respondents who are tenants compared to those who are owners of their housing, confirming the tendency found in previous studies (Speare, 1974; Lu, 1999; Balestra, Sultan, 2013; Boschman, 2018) that homeowners are more satisfied, compared to tenants, as ownership encourages greater involvement in improving the place of residence, which is thus closely linked to a higher assessment of the environment.

Likewise, as already revealed in the studies of other authors (Speare, 1974; Parkes et al., 2002), persons with place attachment, in this case – to Jelgava, are more satisfied with the quality of the environment and personal safety in the city compared to persons who do not have any place attachment. People with place attachment have developed closer social bonds in their place of residence, thus strengthening the attachment to the place and raising the assessment of the place of residence.

4.3. Infrastructure (Factor 2)

The results of the factor analysis revealed that the provision of infrastructure in the opinion of the respondents is the second most important factor influencing the residential satisfaction assessment in Jelgava, which is characterized by these determining attributes: public spaces, green areas, cultural and sports facilities. Overall, the average rating of infrastructure provision in Jelgava is 3.83 out of 5, which, in comparison with other factors, is the highest rating in the opinion of the respondents.

Analysing the assessment of infrastructure provision in terms of respondents' demographic indicators, the results revealed (Table 3) that it is influenced by nationality and the presence of a child in the household. Latvian respondents are more satisfied with the provision of infrastructure in Jelgava, while non-Latvians are more critical of it. Also, the infrastructure of the city is assessed statistically significantly lower by persons with a child living in the household, who, compared to the childless respondents, give a statistically significantly lower rating to the accessibility of cultural facilities and public spaces. These results are consistent with the studies (Dekker et al., 2011; Balestra, Sultan, 2013) showing that a child's presence in the family increases the demands for certain infrastructural amenities, entertainment and recreational opportunities, thus creating a more critical view of urban infrastructure.

Amongst the socio-economic indicators, the assessment of urban infrastructure is influenced by the respondents' subjective satisfaction with the financial situation of the household and overall satisfaction with their life. Respondents who have expressed satisfaction with the financial situation of their household also statistically significantly higher rate the provision of infrastructure in the city. This shows that people with higher incomes also have more extensive recreational opportunities in the city. It also confirms the trend found in empirical studies (Boschman, 2018; Lu, 1999; Baum et al., 2010; Dekker et al., 2011; Balestra, Sultan, 2013; Weziak-Bialowolska, 2016) that households with a better financial situation and higher income tend to be more satisfied with their place of residence compared to the households with a less satisfactory financial situation.

Table 3. **Assessment of infrastructure (Factor 2) according to the indicators characterizing respondents and households**

		Average value	Kruskal-Wallis value H	df	*p*
Demographic profile					
Gender	Male	3.83	0.009	1	0.926
	Female	3.83			
Age	18–34	3.83	3.083	2	0.214
	35–64	3.79			
	65 and above	3.91			
Nationality	Latvian	3.85	4.178	1	0.041*
	other	3.73			
Marital status	lives alone	3.85	0.832	1	0.362
	married or in cohabitation	3.81			
Children living in household	yes	3.76	4.146	1	0.042*
	no	3.86			
Socio-economic profile					
Education	basic	3.79	6.150	3	0.105
	general secondary	3.81			
	professional secondary education or vocational education	3.75			
	higher	3.89			
Occupational status	employed	3.86	2.598	3	0.458
	unemployed	3.75			
	studying	3.79			
	employed and studying	3.85			
Satisfaction with financial situation	satisfied	3.92	28.651	1	0.000*
	others	3.68			
Overall satisfaction with life	satisfied	3.88	21.714	1	0.000*
	others	3.57			
Migration experience					
Duration of living at the place of residence	recently migrated	3.80	1.396	1	0.237
	long-term residents	3.85			
Plans regarding migration	plan to move	3.76	1.260	1	0.262
	others	3.85			
Housing and place attachment					
Type of housing	apartment	3.81	0.937	2	0.626
	detached house, terraced house	3.86			
	dormitories	3.87			
Tenure	owned	3.81	0.596	1	0.440
	rented	3.85			
Place attachment	attached	3.91	40.162	1	0.000*
	others	3.62			

* – statistically significant difference (p<0.05)

Source: created by the author on the basis of Jelgava population survey data

Respondents who admitted that they are generally satisfied with life also indicated a higher assessment of the provision of infrastructure in the city, in comparison to those who were less satisfied with life. According to the results of the study, the assessment of urban infrastructure provision is not affected by the indicators characterizing the respondent's migration experience. On the other hand, from the group of indicators characterizing housing, the only indicator influencing the assessment of infrastructure is the place attachment to Jelgava. People who feel attached to Jelgava rate the infrastructure in the city higher than those who do not feel a place attachment to it, confirming the connection between place attachment and residential satisfaction assessment revealed in other studies (e.g. Inch, Floreks, 2010).

4.4. Healthcare and transport (Factor 3)

Although less than by the other factors, the residential satisfaction assessment is influenced by the factor of healthcare and transport provision. According to the results of the factor analysis performed in the study, in the context of the Jelgava population survey, it includes urban environment attributes like healthcare and the availability of public transport. In general, the respondents' assessment of healthcare and transport provision was average, and the respondents rated it with an average of 3.12 out of 5. In addition, the lowest assessment among the components of this factor was received by public transport, which the respondents rated with an average of 2.98 out of 5.

Analysing the assessment of healthcare and transport according to the demographic indicators characterizing the respondents in Jelgava (Table 4), the results did not reveal a correlation in the assessment of the urban environment between different social groups. Of the socio-economic indicators, subjective satisfaction with the household's financial situation and satisfaction with life in general influence the overall assessment of this factor, confirming the close correlation of these indicators with the assessment of the place of residence and revealing that overall attitude towards life affects the perceptions of different areas of quality of life. Respondents who are satisfied with life in general also rate this factor influencing the attractiveness of the urban environment higher, compared to respondents who are less satisfied with their lives. Among the set of indicators characterizing the migration experience of the respondents, only the respondents' plans to move affect the assessment of healthcare and transport provision – statistically significant differences in the assessment of this factor were observed between respondents who plan to move to another place in the next few years and those who do not or have not yet decided, as the former assessed healthcare and transport provision significantly lower.

Table 4. **Assessment of healthcare and transport (Factor 3) according to the indicators characterizing respondents and households**

		Average value	Kruskal-Wallis value H	df	*p*
Demographic profile					
Gender	Male	3.18	3.474	1	0.062
	Female	3.08			
Age	18–34	3.10	2.514	2	0.285
	35–64	3.11			
	65 and above	3.25			
Nationality	Latvian	3.13	1.212	1	0.271
	other	3.08			
Marital status	lives alone	3.14	0.104	1	0.747
	married or in cohabitation	3.11			
Children living in household	yes	3.16	2.852	1	0.091
	no	3.09			
Socio-economic profile					
Education	basic	3.08	1.377	3	0.711
	general secondary	3.11			
	professional secondary education or vocational education	3.07			
	higher	3.16			
Occupational status	employed	3.16	5.322	3	0.150
	unemployed	3.14			
	studying	3.06			
	employed and studying	3.04			
Satisfaction with financial situation	satisfied	3.22	23.216	1	0.000*
	others	2.95			
Overall satisfaction with life	satisfied	3.19	29.244	1	0.000*
	others	2.79			
Migration experience					
Duration of living at the place of residence	recently migrated	3.08	2.730	1	0.099
	long-term residents	3.15			
Plans regarding migration	plan to move	2.99	6.186	1	0.013*
	others	3.16			
Housing and place attachment					
Type of housing	apartment	3.14	2.731	2	0.255
	detached house, terraced house	3.10			
	ormitories	3.05			
Tenure	owned	3.10	0.553	1	0.457
	rented	3.16			
Place attachment	attached	3.23	39.326	1	0.000*
	others	2.83			

* – statistically significant difference (p<0.05)

Source: created by the author on the basis of Jelgava population survey data

Overall, the results reveal that the indicators characterising individuals or their households that most pronouncedly affect the residential satisfaction assessment, and which were closely correlated with all factors influencing the residential satisfaction assessment, are the financial situation of the household, overall satisfaction with life and place attachment. This leads to the conclusion that individuals who are generally more satisfied with life, who have a more favourable household financial situation and who feel attached to the city, value the urban environment higher and feel more satisfied with it than those who have a more critical outlook on life, who are in a poor financial situation and do not feel attached to the city, confirming the connections found in previous studies (Boschman, 2018; Lu, 1999; Baum et al., 2010; Weziak-Bialowolska, 2016; Speare, 1974; Parkes et al., 2002).

4.5. Residential satisfaction according to different groups of inhabitants

The results of the study reveal that residential satisfaction in Jelgava receives a high rating from 80.1% of the respondents, while only 5.9% of the respondents give it a low rating (average rating 3.98 out of 5, standard deviation 0.829). The survey data allowed to create a profile of the respondent, separating the survey participants who gave higher ratings from those who expressed a more critical attitude (Table 5). Young people and residents who have recently changed their place of residence are more critical. This profile corresponds to students who have chosen studies at the Latvia University of Life Sciences and Technologies. On the other hand, seniors who have lived in the city for a long time, rate the residence in the city the highest.

Table 5. **Profile of respondent according to overall assessment of place of residence**

Indicator	A HIGHER ASSESSMENT	A LOWER ASSESSMENT
Gender	Male	Female
Age	Above 65	18–24
Marital status	Married or in cohabitation; with children living in household	Living without a partner; no children living in household
Location of a housing	Lives in low-rise built up areas	Lives on high-rise housing estate
Type of housing	Detached house	Dormitory
Tenure	Owner	Tenant
Duration of living at the place of residence	Long-term resident (no recent migration experience)	Moved here relatively recently (has a recent migration experience)
Location of workplace	Place of work or studies is located in Jelgava	Place of work – outside Jelgava (not Riga)
Occupation	Employed	Studying
Education	Professional secondary or vocational education	Secondary education
Satisfaction with household financial situation	Satisfied with own financial situation	Dissatisfied with own financial situation
Nationality	Other	Latvian

Source: created by the author on the basis of Jelgava population survey data

Based on the developed respondent profile, the assessment of factors influencing the residential satisfaction of students with migration experience in the course of the study was analysed in the context of other population groups – students and young people without migration experience, seniors and other respondents.

When asked how satisfied the respondents were with life in Jelgava in general, students with migration experience rated it with an average value of 3.59 out of 5, which is significantly lower than the average for the total sample of respondents (3.98 out of 5) and for comparative samples of respondents – students and young people without migration experience (4.06 out of 5), seniors (4.27 out of 5) and other respondents (4.03 out of 5). This shows that students with migration experience have a significantly more critical opinion than permanent residents of the city regarding the overall life in the city. On the basis of the previous conclusions that residential satisfaction assessment is mainly influenced by subjective satisfaction with life in general, satisfaction with financial situation and place attachment, a comparison of these indicators was made between students with migration experience and comparable samples of respondents. Students with a migration experience have a statistically significantly lower place attachment to the city compared to other groups of respondents, which echoes the results of studies by other authors (Hubbard, 2008; Fabula et al, 2017; Munro, Livingston, 2012; Fleuret, Prugneu, 2015), confirming that the university city is only a transit point with which there are no close emotional ties.

Also, the satisfaction with life of students with migration experience in general is significantly lower than in other samples of respondents, which is thus one of the reasons for the low satisfaction with life in the city as a whole and residential satisfaction assessment of living there. This confirms the relationship found in the literature (Fleuret; Prugneu, 2015), stating that students' environmental assessment is closely related to overall subjective well-being, as well as consistent with other studies (Speare, 1974; Parkes et al, 2002; Skifter Andersen, 2008), which confirm the correlation of place attachment with the assessment given to the place of residence. On the other hand, contrary to the studies exploring the impact of financial status on residence assessment (Baum et al., 2010; Balestra, Sultan, 2013; Weziak-Bialowolska, 2016; Boschman, 2018; Yin et al., 2018; Abdu et al., 2014), in the case of Jelgava students, the financial situation is most likely not the determining indicator influencing residential satisfaction assessment, as it is not statistically significantly lower than for other groups of respondents. The low satisfaction with life in Jelgava in general can be explained by the fact that according to empirical research (Inch, Sun, 2013; Wesselmann; 2019), the attractiveness, orderliness and safety of the environment, which students critically evaluate in Jelgava, are urban attributes affecting the assessment the most.

Environmental quality and personal safety (Factor 1) is the most important factor influencing residential satisfaction in Jelgava. According to students with migration experience, its assessment in Jelgava is relatively low or 3.51 out of 5. Compared to students, young people without migration experience or the most satisfied social group of society – seniors, in case of students with migration experience it is statistically significantly lower ($p=0.000$), and it is also lower than for other survey respondents. This is due to the specifics of Jelgava and Latvia University of Life Sciences and Technologies, – a large number of students come from smaller cities and rural areas, where environmental pollution and personal safety risks are usually lower than in large cities,

which may affect the assessment of this factor in the new place of residence. On the other hand, young people living in Jelgava have developed a greater place attachment to the city (according to the results of this survey, 37.6% of students with migration experience and 85.2% of students and young people without migration experience have a place attachment to this city), and this, in turn, closely correlates with residential satisfaction assessment (Speare, 1974; Parkes et al, 2002; Skifter Andersen, 2008). This group is accustomed to the problems of the environmental quality or safety of the city and does not perceive them as acutely as the young people who have recently moved to Jelgava.

According to the results of the survey, **infrastructure (Factor 2)** is the second most important factor influencing residential satisfaction assessment of Jelgava residents, and it is also the highest-rated among other factors. Also, according to students with migration experience, it received a relatively high assessment (average value 3.80 out of 5). Although students with migration experience rated the provision of infrastructure slightly lower than students and young people who had already lived in Jelgava, no statistically significant differences were observed between the young people of both groups (p=0.128). This confirms that the fact of the previous place of residence has no significant effect on this factor affecting residential satisfaction. At the same time, there are no statistically significant differences in the assessment of this factor between students with migration experience and seniors, who are traditionally considered to be the most satisfied part of society and who rated this factor with an average of 3.91 out of 5. This shows that students, most of whom have come to Jelgava to obtain an education from other, smaller Latvian cities and rural areas, highly appreciate the cultural and sports facilities, green areas and public spaces of the city, which might have been less accessible in the previous place of residence.

Finally, **healthcare and transport (Factor 3)**, which in the current study was rated by the respondents as the weakest link in the overall residential satisfaction assessment, also received the lowest score (average value 2.99 out of 5) in the opinion of students with migration experience. Compared to the comparative group of respondents – young people who have lived in Jelgava before and seniors – the assessment of health care and transport provision of students with migration experience is significantly more critical (p=0.005 – the young people living in Jelgava; p=0.020 – the seniors).

4.6. Spatial differentiation in residential satisfaction assessment

In order to assess whether certain correlations can be observed in the second tier cities in accordance with the model of the residential satisfaction research scales and spatial differentiation developed in the framework of the current thesis, the empirical study provided residential satisfaction analysis two different spatial dimensions.

The results in Jelgava confirm the conclusions reached in the research of other authors that the assessment of residence differs at various scales of residence research. In the case of Jelgava, the observed correlations are similar to the findings of other empirical studies (Altman, Werner, 1985; Fleury-Bahi et al., 2008), and confirm that the residents value the vicinity of their place of residence – housing and the immediate surroundings – higher than the city as a whole. Residents of Jelgava rated the area closest to their place of residence with an average of 4.02 out of 5, while living in Jelgava as a whole with – an average of 3.98 out of 5. This can be explained by a greater place attachment to the

housing and the surrounding area, which positively correlates with assessment of the residence (Fleury Bahi et al., 2008).

Analysing **environmental quality and personal safety (Factor 1)** as a comparison between urban zones (Figure 2), it can be concluded that in High-rise housing estates it is statistically significantly lower (average value 3.55 out of 5) compared to the other two urban zones. The quality of the environment is usually rated higher in the parts of the city and neighbourhoods inhabited by people with higher income and higher level of education (Chhetri et al., 2011). This correlation is also confirmed in the case of Jelgava, because the characterisation of the sample of respondents confirms that the High-rise housing estates are populated by a lower share of economically active inhabitants compared to the Centre and Low-rise built-up areas. Similarly, there are fewer people with higher education living in High-rise housing estates than in the other two zones of the city.
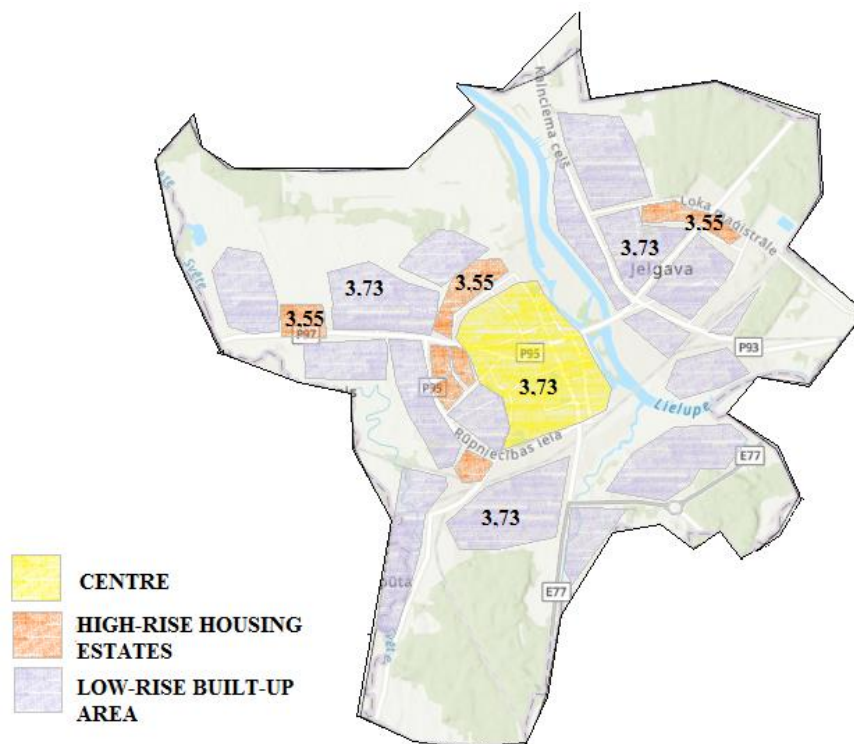
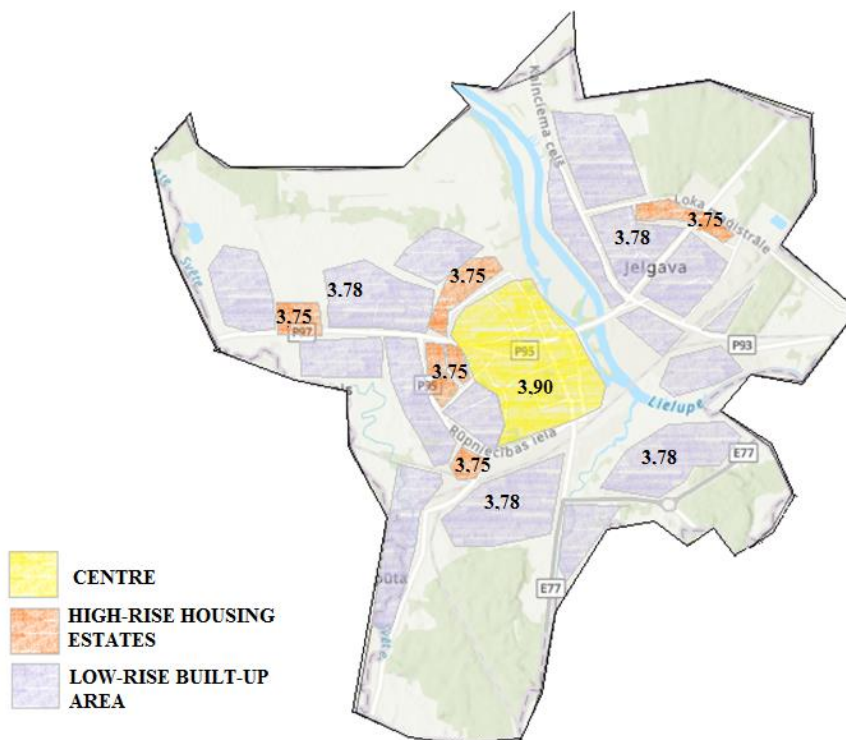*Source: created by the author on the basis of Jelgava population survey data*

Figure 2. **Respondent assessment of environmental quality and personal safety (Factor 1) in zones of Jelgava city**

Although the city Centre has the highest air pollution and noise levels, the survey of Jelgava residents reveals that both these city attributes are assessed very similarly in all zones of the city, and there are no statistically significant differences among them. However, it should be taken into account that the quality of the environment in the Jelgava zone of Low-rise built-up area is affected by various industrial objects, including the railway line and national roads, which have a significant impact on the environment, and thus may have a negative impact on the environmental quality assessment given by the residents of this territory. Moreover, similarly to a study in London (McKerron, Mourato, 2009), this could be explained in the context of the opportunities available in the city centre, such as a wider access to entertainment and public services, which relatively reduce

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the importance of environmental quality issues in overall residential satisfaction assessment.

Spatial differentiation, on the other hand, can be observed between Jelgava city zones in the assessment of orderliness and safety. For example, the assessment of urban orderliness given by the population living in the Centre is statistically significantly higher than the assessment provided by those living in High-rise housing estates ($p=0.015$). Also, with regard to the assessment of the security situation, those living in High-rise housing estates are significantly more critical compared to those living in the Centre ($p=0.000$) and those living in the zone of Low-rise built-up area ($p=0.008$). Although High-rise housing estates have become tidier in recent years, they still have very few green areas, which gives the impression of a lower environmental quality in this zone. Similarly, as in other Central and Eastern European countries (Kovacs, Herfert, 2012; Beckhoven, Van Kempen, 2006; Dekker et al, 2011), these neighbourhoods are often considered to be degraded, relatively unsafe in terms of criminogenic situation, so it is not surprising that the inhabitants of this city zone indicate that the city as a whole is less safe and give it a lower rating in terms of environmental quality compared to those living in other parts of the city.

According to the results of the study, the Jelgava residents living in the city Centre are statistically significantly more satisfied with **infrastructure (Factor 2)** (average value 3.85 out of 5), compared to the residents living in the other two city zones (Figure 3).
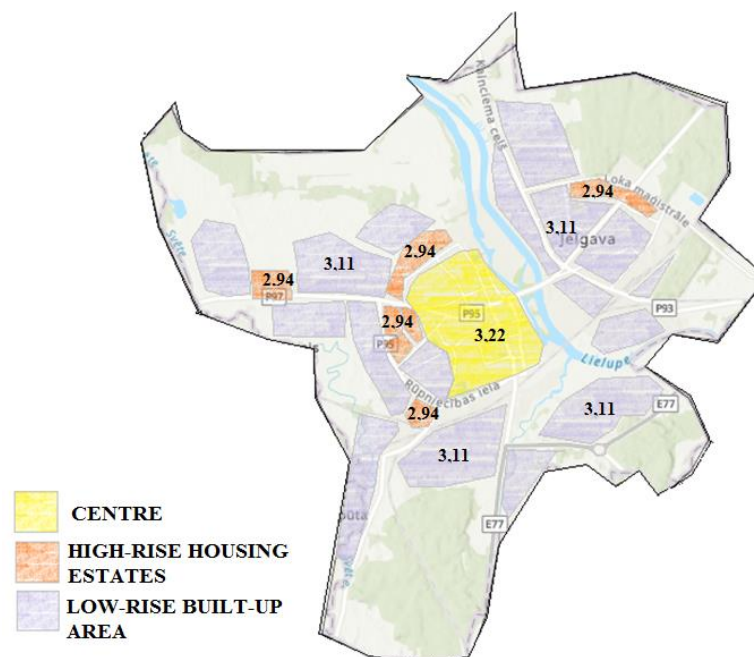

Source: created by the author on the basis of Jelgava population survey data

Figure 3. **Respondent assessment of infrastructure (Factor 2) in zones of Jelgava city**

On the other hand, there are no statistically significant differences in the assessment of infrastructure between the residents living in the zone of Low-rise built-up area of the city (average value 3.78 out of 5) and in the High-rise housing estates (average value 3.75 out of 5). These results confirm that residents living in the city Centre cite extensive infrastructure provision as the main reason for high satisfaction with their place of

residence (Du et al., 2017; McKerron, Mourato, 2009; Gentile, 2005; Chhetri et al., 2011). According to the study, this factor influencing the attractiveness of urban space includes the attributes like cultural and sports facilities, as well as public spaces that are more accessible in the city Centre compared to other zones of the city. No statistically significant differences were observed among city zones in the assessment of sports facilities and green areas, while in the assessment of public spaces and cultural facilities there were certain spatial correlations. Residents of High-rise housing estates rated the availability of cultural facilities significantly lower than those living in the Centre (p=0.000). This result can be explained both by the fact that the most important cultural facilities, such as Jelgava House of Culture, which offers the most extensive cultural programme in the city, are located in the city Centre, and by the fact that lower satisfaction with the supply of cultural facilities is indicated by non-Latvians, whose proportion among the High-rise housing estate inhabitants is higher (27.9% non-Latvians, 72.1% Latvians) than in the city Centre (15.1% non-Latvians, 84.9% Latvians) and in the zone of Low-rise built-up area (17.7% non-Latvians, 82.3% Latvians). Residents of Jelgava zone of Low-rise built-up area, on the other hand, are more dissatisfied with the availability of public spaces, such as markets, squares, compared to respondents living in the Centre (p=0.032), as these facilities are mainly located in the city Centre and the notable distance to reach them, which is an important indicator impacting the overall quality of life (Knox, Pinch, 2010; Kahrik et al., 2016; Gentile, 2005) has a negative effect on their overall assessment.

Similarly, the assessment of **healthcare and transport (Factor 3)** among Jelgava city zones is statistically significantly lower in High-rise housing estates, whose inhabitants rated this factor with an average of 2.92 out of 5. However, there are no statistically significant differences between the respondents living in the city Centre and Low-rise built-up area, and the average rating is 3.22 in the city Centre and 3.11 in the Low-rise built-up area, respectively (Figure 4).

Source: created by the author on the basis of Jelgava population survey data

Figure 4. **Respondent assessment of healthcare and transport (Factor 3) in zones of Jelgava city**

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These results can be largely explained by the fact that the population living in High-rise housing estates is characterised by the worst indicators characterizing the socio-economic situation of an individual – the lowest share of higher education graduates (33.6% in High-rise housing estates, 39.8% in the Centre, 48, 3% in Low-rise built-up area) and the highest share of unemployed persons (16.8% in High-rise housing estates, 13.6% in the Centre, 14.1% in Low-rise built-up area). The results of the survey also reveal that High-rise housing estates also have the lowest level of satisfaction with the household's financial situation. Respondents living in High-rise housing estates have a higher proportion of the elderly population or 12.7%, compared to 8.7% in the Centre and 11.0% in the Low-rise built-up area of the city, and this group is more dependent on health care services, hence their statistically significantly lower assessment of this factor in comparison to those living in the Centre (p=0.006).

CONCLUSIONS AND RECOMMENDATIONS

The doctoral thesis provides evaluation of the socio-spatial differences in residential satisfaction of Jelgava inhabitants. The evaluation of previous studies, the statistical data used in the work and the results obtained in the population survey are reflected in the following conclusions:

1. Residential satisfaction, viewed in this study as the satisfaction level of the inhabitants of an area with their place of residence, which is influenced by various socio-spatial factors, has become an important direction of urban geography research also in second tier cities. This enables identification of those aspects of housing that could be improved in order to make the city an attractive place to live, thus, beyond increasing the chances of maintaining the existing population it can contribute to attracting new inhabitants, which is particularly important for second tier cities to ensure balanced regional development in Latvia.

2. Residential satisfaction in second tier cities is determined by the set of urban space attributes. Based on this set of attributes, the following factors of residential satisfaction are distinguished: (1) environmental quality and personal safety, (2) infrastructure, and (3) healthcare and transport. The research carried out in the framework of the current thesis and the analysis of the theoretical literature confirm that in Jelgava, as in other second tier cities, the most important factor characterizing residential satisfaction is the quality of the environment and personal safety.

3. Differences in the residential satisfaction assessment are significantly influenced by the financial situation of the household, satisfaction with life in general and place attachment. As the socio-economic and housing situation improves, satisfaction with life in general increases, as does the attachment to the city, and residential satisfaction also increases.

4. The profile of the satisfied and less satisfied representative of the population shows that the most satisfied with living in a second tier city are seniors who own their home, have lived in their place of residence for a long time, while those who study and live in rented housing, and whose stay in the city has been comparatively brief, are the least satisfied with living in second tier cities.

5. Comparing the residential satisfaction assessment of different social groups in the university city, it can be concluded that the most critical assessments are given by students with migration experience. This can be explained by a significantly lower attachment to the city compared to other population groups, since these students perceive the university city as a transit point without forming a close emotional connection with it.

6. The critical assessment of the university city by students with migration experience shows that a large part of them are likely to leave the city after graduation. In order for university graduates to choose a second tier city as their future place of residence, special emphasis should be placed on improving the quality of the environment and personal safety, as well as improving healthcare and public transport, which students, in comparison to other groups, rate more critically in a city of this level.

7. A topical direction in the field of urban research explores the spatial aspects of the geographical diversity of residential satisfaction, which so far in Latvia has been mainly analysed in the capital, Riga. The model of the residential satisfaction research scales and spatial differentiation developed in the dissertation enables implementation of complex analysis of residential satisfaction in two dimensions–- (1) according to the location of the spatial unit in relation to the individual's place of residence and (2) according to the zones of the city. The results show that this model can be successfully applied to determine the spatial differentiation in the residential satisfaction of other second tier cities.

8. The research carried out in Jelgava confirms that the spatial differentiation of the residential satisfaction in the second tier cities can be assessed as complexes both at different scales of research and in different urban zones. Respondents rate residential satisfaction higher in the immediate vicinity of their place of residence than in the city as a whole. This could be explained by a more pronounced place attachment to the immediate, better-known neighborhood. Different assessments in the zones of the city are determined by the affiliation of the population to different social groups.

9. Spatial differences in residential satisfaction in the second tier city's zones cannot be assessed in isolation from the social structure therein, as this is also confirmed by the different factors characterizing residential satisfaction in different zones of the city.

10. Satisfaction with housing and the immediate vicinity of the place of residence is influenced by the location of the individual's place of residence in a certain zone of the city. Compared to other zones of the city, the assessment of the vicinity near the place of residence is significantly higher in the low-rise built-up area, which is characterized by lower population density and higher socio-economic indicators. This shows that the residents rate the place of residence higher in less densely populated urban areas.

Recommendations for further research

●   To date, the processes in the urban space caused and promoted by the presence of students and young people have not been studied in Latvia, while in other European countries such studies are becoming increasingly popular. Therefore, research on studentization and increase in younger population in Latvian cities should be carried out, assessing the impact of students and young people on urban space. Furthermore, Jelgava as a student city could be a suitable research area to explore the phenomenon of studentification.

●   Conducting research on residential satisfaction assessment would be useful in other second tier cities and smaller towns of Latvia, which are important centres for retaining people in the regions and attracting new inhabitants. This would help to understand population satisfaction with life and urban space in such cities and towns, and forecast future trends.

●   It is necessary to continue research on residential satisfaction assessment in the spatial aspect, especially in the new built-up areas.

● Further expanding the research in the field of behavioural geography in Latvia would be desirable, particularly exploring the links between residential satisfaction assessments and place attachment, migration intentions and changing the place of residence.

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