SATISFACTION OF INHABITANTS IN DIFFERENT URBAN STRUCTURES. CASE STUDIES IN BRNO, OSTRAVA AND ZLIN

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Abstract:
Cities are built of diverse types of urban structures. The paper is devoted primarily to those structure types in which people live. In Czech conditions, we can find structures of historical cores, blocks of flats from the 19th century, neighbourhoods of family houses, socialist prefabricated housing estates from the 20th century, as well as family houses on the city perimeter or even beyond the city limits. Satisfaction of inhabitants in characteristic localities of these types of urban structures was surveyed through questionnaires. The research includes residential localities in three cities in the Czech Republic: Brno, Ostrava and Zlín. The study looks at the relationship between residential satisfaction and urban structure type, analysing a possible relation between demographic parameters of locals and the satisfaction of inhabitants in the respective urban structures. It appears that happier people live rather in low-rise buildings situated in green areas with the safe environment and good transport availability. Such localities are often inhabited by educated people.

Introduction

Many types of urban structures in cities serve for housing. In Czech conditions, these include, namely, the natural structures of historical cores, blocks of flats from the 19th century, neighbourhoods of terraced houses, semi-detached houses and solitary family houses, modernist prefabricated housing estates from the period of socialism of the late 20th century as well as new residential areas of family houses from the end of the 20th and beginning of the 21st centuries situated beyond the city limits, often linked to original villages. The structures reflect two fundamentally different ideological concepts - the concept of a compact city and the concept of loose, modernist built-up area or garden cities. Pros and cons of these two principles are discussed in a number of studies (Neuman, 2005; Hirt, 2007; Wittmann & Kopáčik, 2019).

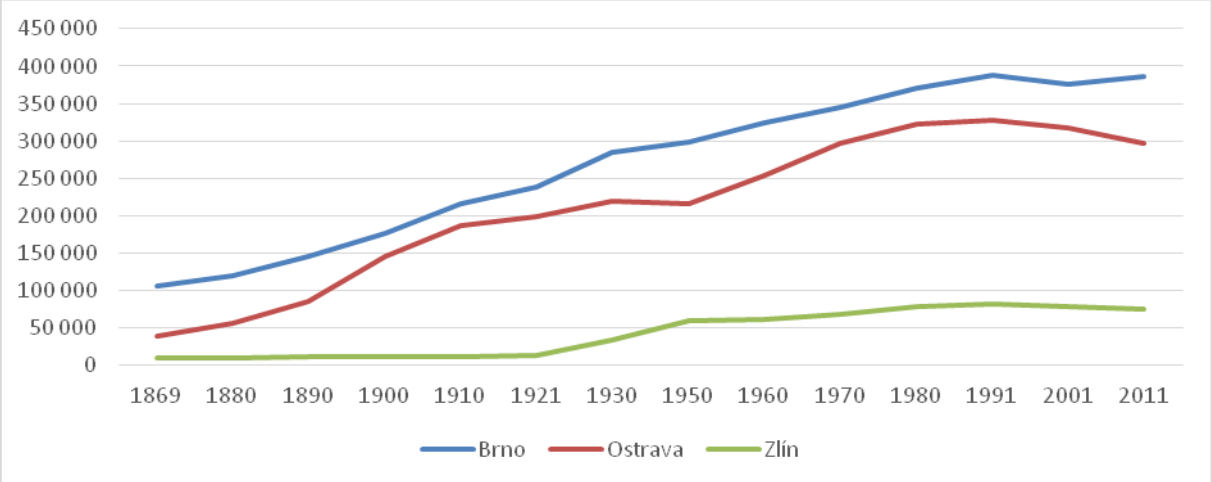
The paper dwells on an extensive research devoted to the relation of urban structures in three cities in the Czech Republic – Brno, Ostrava, and Zlín – to all three usually mentioned pillars of sustainability – environment, society and economy. In this paper, we focused on the societal pillar to determine whether a particular type of urban structure can influence the satisfaction of local inhabitants. Since public statistical data concerning the satisfaction of inhabitants in different types of urban structures are not available, we gained them from some characteristic localities of the above-mentioned three cities based on a questionnaire survey. Our questions were focused, for example, on the feeling of safety, feeling of privacy, availability of civic amenities, neighbourly relationships, and perception of aesthetic qualities. We also analysed demographic data from censuses in 2001 and 2011, development of population numbers from

2001 to 2011, share of seniors and children, education and unemployment in 2011 (Czech Statistical Office, 2019). The demographic data served as supporting information for results obtained from the questionnaire survey. Some studies indicate that residential satisfaction increases with higher education that can generate higher income and with higher age. Higher education and higher income could affect the capacity for choosing a place and type of housing; higher age has to do with a long-term affiliation with the place of residence (Buys & Miller, 2012; Campbell et al., 1976; Lu, 1999). Do the wealthier social groups prefer dispersed, low-rise urban structures where inhabitants feel more satisfied as suggested by some studies (e.g., Buys & Miller, 2012; Galster & Hesser, 1981; Lu, 1999)? Answers to this question and to some other related issues are sought in this paper in the analysis of the relationships between urban structure, the detectable demographic parameters of local residents (Czech Statistical Office, 2019), and their satisfaction.

The case studies concerned deliberately three of the four biggest cities in Moravian region– all of them are regional metropolises with regional authorities, important public institutions, and universities, experiencing the postindustrial stage of their development. Nevertheless, the historical development, overall character, and inner urban arrangement of these three cities significantly differ:

1. Brno – a typical concentric city with the compact historical core, circular roads and radial communications,
2. Ostrava – a typical conurbation with no distinct city centre and evenly spread population, a rather an urbanized landscape considerably affected by former mining activities and heavy industries, with important local centres of peculiar history and atmosphere, and with the diffuse street pattern,
3. Zlín – a modern city whose great part is formed of a loose functionalistic structure with large green areas, extensive precincts of the former shoe factory right in the city centre, and a characteristic linear layout in the valley along the main road, railway and river.

Graph 1: *Long-term population development in the surveyed cities based on official censuses. Own elaboration*



Source: Czech Statistical Office, 2015 (processed by authors)

1. Theoretical background

Overall, residential satisfaction is largely dependent on various management aspects of housing development. To improve residential satisfaction, policymakers, developers, architects, managements, and staff need to understand the driving forces of residential satisfaction and focus on those aspects that are most likely to affect the environment (Mridha, 2015).

Regarding (social) neighbourhood factors, residential satisfaction seems to be higher in rural and more prosperous areas, and in areas with fewer ethnic minorities. Some studies indicate that people seem to value high, particularly social contact, traffic safety, and social safety, an attractive neighbourhood with facilities within the good environment quality for their residential satisfaction (see, for instance Buys & Miller 2012; Galster & Hesser 1981; Lovejoy et al. 2010; Lu 1999). Living in a neighbourhood characterized by economic disadvantage is negatively associated with neighbourhood satisfaction (Chen et al., 2013; Ibem et al. 2019).

Residents tend to be more satisfied with their own suburbs than with other suburbs. New suburban housing areas commonly attract similar people, firstly because moving to any new family dwelling requires a certain level of income, and secondly because suburban settlements are perceived as more idyllic, cleaner, and safer (Atkinson, 2006; Kährik et al., 2012).

Are there any specifics of residential satisfaction in postsocialist cities? Although in Eastern Europe, the revolutions occurred 30 years ago, urban structures show a long-term inertia. The construction of prefab housing estates was the only preferred way of creating new residential parts in socialist cities. The prefabricated constructions were built also in Western Europe where they represent a social dwelling. In socialist countries, such a way of residential construction should have contributed to the social levelling of the society and was meant for all social groups of population. Thus, if we are looking for a specific difference of postsocialist countries, we should explore on the satisfaction with housing estates.

Changes of ownership played an important role in the transition period as Górczyńska (2017) shows with the example of Warsaw. Both main drivers of the transitional period (restitution and low-cost privatisation) were out-market tools which together with the regulated rent postponed the onset of real market conditions. Lower residential mobility and disinvestment in the 1990s was the consequence. Therefore, the realization of residential preferences and satisfaction was postponed to the beginning of the 21st century. Due to problems with the provision of housing in big cities (especially Brno in our case), other aspects than the type of urban structure - such as marital status, ownership / rental of the flat, its size, privacy, neighbourhood attachment decide about the residential satisfaction of young people who are more or less decisive for the future prediction (Milić & Zhou, 2018). Heider (2019) discovered that the postsocialist development of ex-GDR cities is negatively correlated with historical growth rates realized during the times of socialism. It is most likely to be true for heavy industry centres (Ostrava in our case).

In the Czech conditions, the question of general evaluation of residential satisfaction and/or preferences is not too frequent. Authors concentrate their attention on the residential quality of special cases like suburbs (Špačková et al., 2017) or inner cities (Kährik et al., 2015) – especially in Prague. Inner structures of cities were studied in multiple cases, but they were focused on various partial problems, e.g., economy (Wittmann & Kopáčik 2019), environment (Hanák et al., 2015, Vaishar & Zapletalová, 2003), quality of life (Andráško et al., 2013), demography – namely ageing (Galčanová & Sýkorová, 2015) etc.

Urbanists assume that the physical framework (material environment) can more or less influence the social situation and residential satisfaction. Clearly, delimited and hierarchically arranged urban spaces create conditions for desirable social interactions, a feeling of safety and solidarity (Gehl, 2011).

2. Methodology - selection of locations and methods of data obtaining

To compare the satisfaction of inhabitants, we chose nine localities in Brno, seven localities in Ostrava, and six localities in Zlín. The localities are characterized below with illustration images.

2.1 Brno

- BR1: historical core – compact block structure of historical core and city centre;
- BR2: Veveří – typical central block structure formed mainly by apartment houses from the 19th century, which is situated right to the north of the historical core;
- BR3: Královo Pole – suburban low-rise blocks of flats, predominantly from the late 19th and the 1st half of the 20th centuries, are situated on the northern outskirts of inner Brno;
- BR4: Masaryk Quarter – loose residential development from the end of the 19th until the turn of the 1970s and 1980s inside Brno;
- BR5: Bystrc II – loose prefab housing estate from the 1970s on the NW outskirts of Brno;
- BR6: Vinohrady – loose prefab housing estate from the 1980s on the eastern outskirts of Brno;
- BR7: Česká – new satellite of family houses in the village closely linking with Brno to the north;
- BR8: Moravany – new satellite of family houses in the village closely linking with Brno to the south;
- BR9: Syrovice – new satellite of family houses in the village closely linking with Brno to the south.

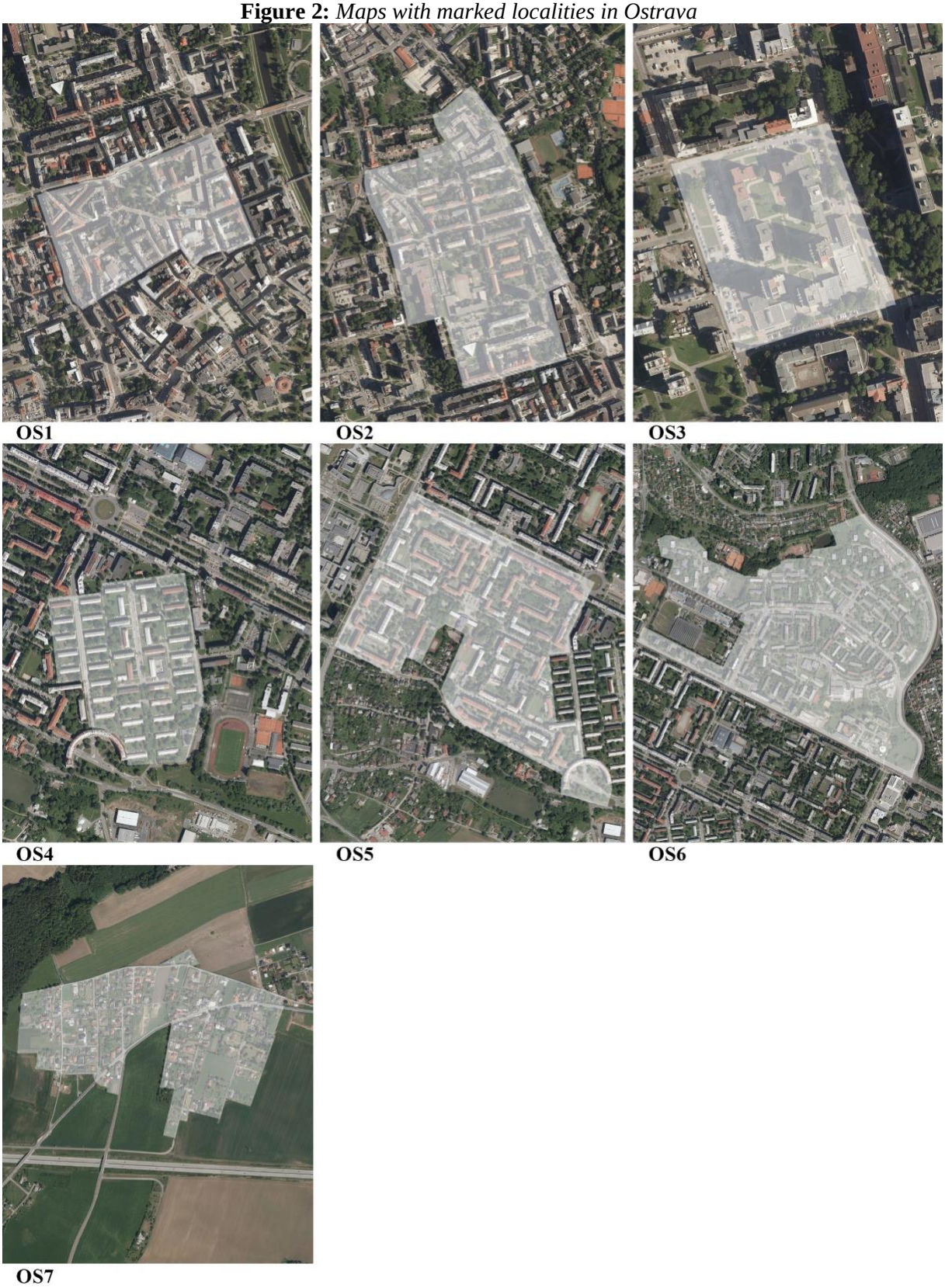
Figure: 1: *Map with marked localities in Brno*

Source: OpenStreetMap, 2020 (processed by authors)

2.2 Ostrava

- OS1: centre – typical central block structure linked to the historical centre of Moravská Ostrava;
- OS2: Jindřiška – semi-closed blocks of mainly apartment houses from the first half of the 20th century situated on the outskirts of Moravská Ostrava centre;
- OS3: Bieblova – semi-closed block of prefabricated apartment houses from the early 1980s wedged in an older structure on the outskirts of Moravská Ostrava centre;
- OS4: Poruba dvouletky – linear blocks of flats from the turn of the 1940s and 1950s;
- OS5: Poruba sorela – blocks of flats from the beginning of the 1950s on the western outskirts of Ostrava – conservation area;
- OS6: Poruba North – loose prefabricated development from the 1970s on the western outskirts of Ostrava;
- OS7: Nová Bělá – largely new satellite of family houses on the southern outskirts of Ostrava.

Figure 2: *Maps with marked localities in Ostrava*

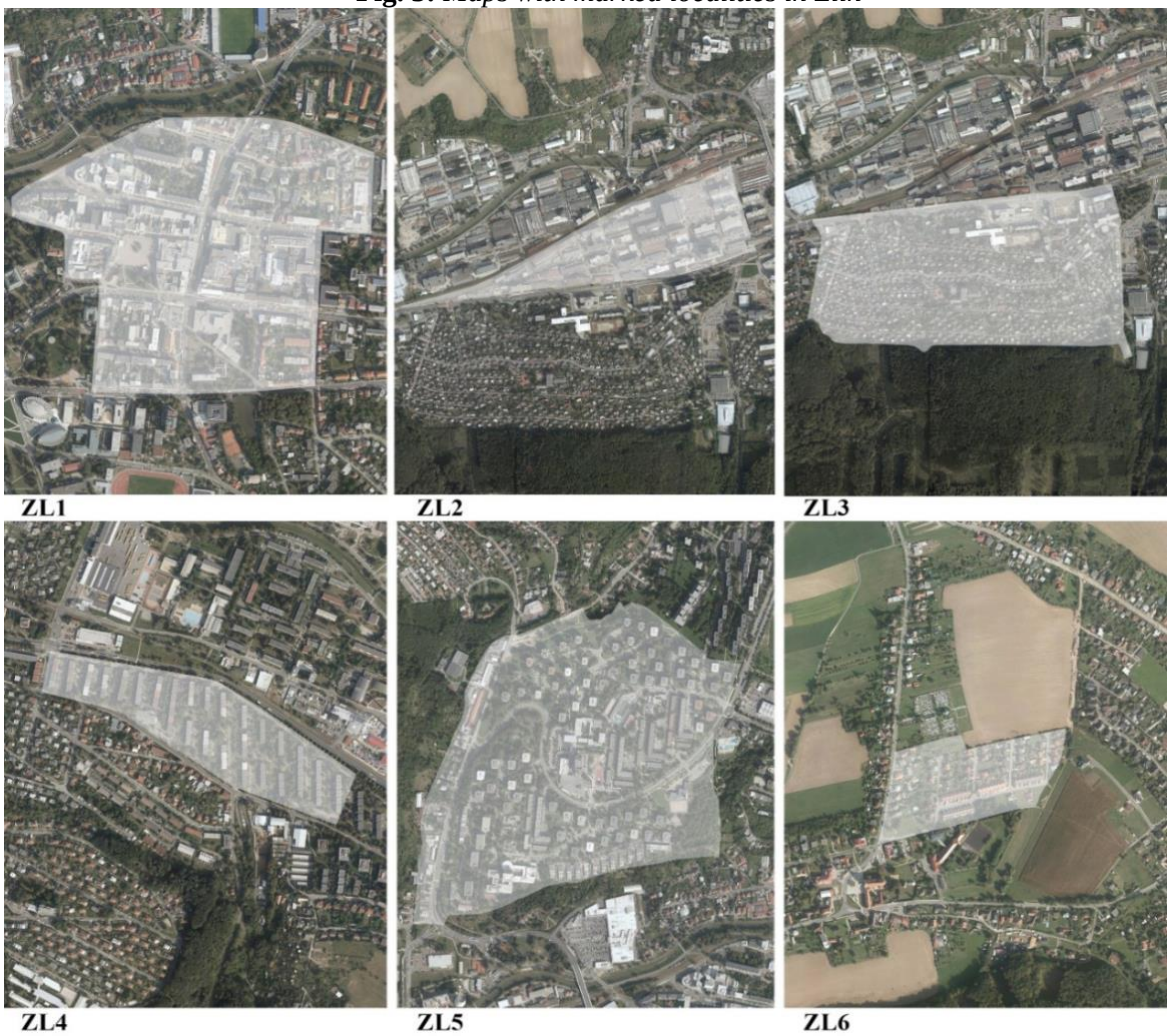


Source: OpenStreetMap, 2020 (processed by authors)

2.3 Zlín

- ZL1: Zlín centre – predominantly compact block structure in the historical core;
- ZL2: Svit rybníky (Ponds) – part of the site of a former manufacturing plant is included in the new city centre and currently under reconversion; since there are hardly any dwellers, the locality is not further mentioned in this paper devoted to the societal issues;
- ZL3: Letná – loose development of two-storey apartment buildings, a functionalistic residential quarter from the period of the 1st Czechoslovak Republic;
- ZL4: Obeciny – linear apartment houses from the end of the 1940s (two-year plan period);
- ZL5: Jižní svahy I (Southern Slopes I) – loose development of prefabricated blocks of flats from the 1960s and 1970s;
- ZL6: Kostelec – predominantly new satellite family houses on the NE outskirts of Zlín.

Fig. 3: *Maps with marked localities in Zlin*



Source: OpenStreetMap, 2020 (processed by authors)

The above localities were analysed on the basis of data gained from the questionnaires and from the statistical survey.

2.4 Statistical data

The demographic analysis includes statistical data from the 2011 census conducted by the Czech Statistical Office and compares data from the censuses made in 2001 and 2011. As censuses are conducted in 10-year periods, the next one will occur in 2021. Parameters screened

include the population development in the chosen localities between 2001 and 2011, the share of residents over 65 and under 15 years of age (so-called index of ageing with a maximally balanced ratio is desirable), the share of residents with higher than basic education (so-called ISCED 3 level and higher; the 2011 average in the Czech Republic was 88 %), the share of residents with academic education (national average 20 %) and the share of unemployed residents in 2011. The obtained data are presented in Tab. 1.

2.5 Questionnaire survey

The analysed localities were subjected to the questionnaire survey. Questions in the questionnaire were answered by residents living in the localities and the answers served to construct a so-called index of residential satisfaction, which is a sum of points acquired for the answers, expressing residential satisfaction – higher scores indicating greater satisfaction. The index of satisfaction reflects answers to questions concerning, for example, the feeling of safety during the day and by night time, aesthetic quality of the environment, neighbourly relationships, feeling of home, or availability of civic amenities. Respondents evaluated each of the answers through points 0 – 10, where 0 points and 10 points represented the worst and the best evaluation of the given phenomenon, respectively. A list of questioned issues is included in Tab. 2. Indices of residential satisfaction are presented in Tab. 2 and Graph 2. Maximum achievable points were 160 (16 questions x 10 points).

In some questions, the points follow out from concrete predefined answers:

Scores for the question "Moving – change of neighbours" dwell on the following possible answers: "Medium change – some residents were changed, some remain" - 10 points; "Small change – nearly the same people stay here" – 7.5 points; "A greater part of neighbours were changed during the last years" – 2.5 points; "The change is great, hardly anybody of old residents remained" - 0 points; "I do not know, I have moved in only recently" – 5.0 points.

In the case of "Long-time residence", the number of points will correspond to the number of years a person lives in the locality; if less than a year – 0 points; if ten and more than ten years – 10 points.

Scores for the question "Participation in maintaining spaces around the place of residence" dwell with the following possible answers: "Yes, I initiate and promote the enhancement of space within my engagement in the activities of self-government, association of owners or in another organization" - 10 points; "Yes, I respond actively to challenges and participate in the enhancement" – 7.5 points; "Yes, I support the planned enhancements but I am not getting involved" - 5 points; "Rather, I just follow things" – 2.5 points; "No, I am not interested" - 0 points.

We distributed altogether ca. 6 600 questionnaires of which approximately 10 – 25 % were filled in 2-3 weeks (a common case study included ca. 350 questionnaires given out).

3. Empiric results

The below Tab. 1, Tab. 2 and Graph 2 present the results obtained. Important results are characterized in the text.

Table 1: *Demographic data from the census in 2011 and 2001. Source: Czech Statistical Office, 2019*

Demographic data according to the census in 2001 and 2011 (%)	BR1	BR2	BR3	BR4	BR5	BR6	BR7	BR8	BR9	OS1	OS2	OS3	OS4	OS5	OS6	OS7	ZL1	ZL3	ZL4	ZL5	ZL6
Change in the number of residents (between 2001 and 2011)	-7.9	-11.1	-4.9	-1.8	-10.8	-13.4	39	79	41	-14.3	-11.8	-20.8	-7.9	-16.7	-10.8	63.1	-10.6	-11.9	-19.3	-15.5	26
The ratio of residents over 65 and below 15 years (2011)	57/43	66/34	63/37	67/33	45/55	49/51	48/52	31/69	38/62	48/52	65/35	52/48	37/63	64/36	70/30	37/63	74/26	51/49	67/33	62/38	49/51
Education - ISCED 3 and higher (2011)	88.5	90.1	92.8	93.8	86.2	89.2	90.1	89.5	86.1	88.8	89.5	88.5	72.1	83.3	84.7	89.1	86.1	82.2	92.2	85.8	88.9
University education (2011)	33.4	39.2	44.9	25.5	36.0	29.0	23.2	17.8	11.4	41.4	35.8	30.6	6.2	22.1	26.1	30.1	23.8	16.5	33.6	22.3	30.2
Unemployment (2011)	6.5	4.6	5.6	2.9	4.8	5.2	2.5	2.9	3.5	4.7	4.9	6.4	11.6	5.3	4.7	4.4	4.8	4.8	3.4	4.4	3
Total number of residents (2011)	1544	3393	3383	5402	2001	12 836	911	2159	1370	1965	3930	877	2127	8794	9315	566	2738	3148	1211	7118	1971

Results in Tab. 1 indicate that the smallest population decline between 2001 and 2011 was recorded in Localities BR3 and BR4 (low-rise blocks of flats and residential development in Brno; decline 4.9 % and 1.8 %, respectively). By contrast, the greatest population decline (>15 %) was recorded in Localities OS3 (prefabricated houses in the wider centre of Ostrava), OS5

(Poruba sorela), ZL4 (Obeciny apartment houses in Zlín) and ZL5 (prefabricated housing estate). The greatest population decline in Brno (10.8 % – 13.4 %) occurred in housing estates BR5 and BR6 and in Locality BR2 situated in the wider centre of Brno. All monitored satellites of family houses (BR7, BR8, BR9, OS7, and ZL6) exhibited a considerable population increase in tens of percent.

The number of seniors is distinctly higher than the number of children in older housing areas in Brno (BR1–BR4, block urban structure as well as loose functionalistic residential development), while the ratio in Brno satellites (BR7-BR9) is reversed. Prefabricated housing estates in Brno (BR5, BR6) show a rather even ratio. In Ostrava, most seniors as compared with children live in Localities OS2 (apartment houses from the 1st half of the 20th century), OS5 (Poruba sorela) and OS6 (Poruba prefabricated housing estate); most children live as expected in Satellite OS7, but also in the linear blocks of flats from the 1940s (OS4, Poruba dvouletky), where a different socio-cultural group lives. In Zlín, seniors predominate in the town centre (ZL1) and in Localities ZL4 and ZL5 (Obeciny apartment houses and prefabricated housing estate).

Population with the highest education (ISCED 3 and higher > 90 %) lives in Localities BR2, BR3, BR4, BR7, and ZL4 (central block structure, low-rise apartment houses, residential development and family houses). Localities BR2, BR3, and ZL4 also exhibit a very high share of residents with university education (>33 %). The share of university-educated residents is at the same level or even higher (>33 %) also in Localities BR1 (historical core of Brno) and rather surprisingly BR5 (prefabricated housing estate), as well as in Localities OS1 (central block structure in Ostrava) and OS2 (blocks of flats on the perimeter of the Ostrava centre). Education standard (ISCED3 and higher) of residents in the monitored satellite of family houses in Brno is on average slightly higher than in the prefabricated housing estates (BR7-9 x BR5, BR6: 88.6 % x 87.7 %). In Ostrava (OS7 x OS6) and in Zlín (ZL6 x ZL5) where the principle is the same, the differences in percent are greater, although (by ca. 3 % - 5 %). As compared with the housing estates in Brno, the share of university-educated residents in satellites is almost half (ø 17.4 % x 32.5 %; however, the result may be partly distorted by including older built-up areas in the villages into the data of satellites). In Ostrava and Zlín, the results are reversed and less distinctive. The least educated and on a national scale a very below-average educated population lives in Locality OS4 (Poruba dvouletky) in Ostrava, both in terms of a share of residents with ISCED3 and higher education (72.1 %), and as to the share of university educated residents (6.2 %).

Unemployment is relatively low in all monitored localities except for OS4 (Poruba dvouletky) where it is higher than 11 %. The other highest unemployment values (>6 %) are recorded in Localities BR1 (historical core of Brno) and OS3 (prefabricated houses on the perimeter of the centre of Moravská Ostrava).

Table 2: *Questionnaire survey data and satisfaction index. Source: authors*

	BR1	BR2	BR3	BR4	BR5	BR6	BR7	BR8	BR9	OS1	OS2	OS3	OS4	OS5	OS6	OS7	ZL1	ZL3	ZL4	ZL5	ZL6
Subjective health condition	8.1	7.3	7.3	7.3	7.2	7.1	8.7	8.0	9.0	7.2	7.5	7.5	5.9	7.2	5.6	8.4	5.0	8.3	7.4	6.3	8.3
Feeling of danger by day	4.5	4.5	4.9	4.9	4.6	4.6	4.9	5.0	5.0	4.5	3.3	4.4	3.6	4.5	4.5	5.0	4.3	4.5	4.2	4.1	4.8
Feeling of danger by night	3.1	3.7	4.5	4.3	4.2	3.8	4.4	4.6	4.6	3.2	2.7	3.0	3.0	3.7	3.2	4.6	3.3	3.8	3.5	3.2	4.1
Untrustworthy strange persons	2.6	3.2	4.3	4.4	3.8	3.3	5.0	4.8	4.8	3.6	2.6	2.9	2.9	3.1	3.5	4.9	3.2	4.1	3.9	2.8	4.7
Good address	8.1	7.9	8.8	8.4	7.6	6.6	8.8	7.6	7.5	8.2	6.9	7.9	6.6	6.4	7.4	8.4	6.8	6.8	8.1	6.4	8.4
Availability of civic amenities	7.0	6.1	6.5	4.6	6.4	6.3	5.7	5.0	5.4	6.3	7.0	6.8	5.7	6.8	5.4	3.8	7.3	6.0	6.2	6.4	5.9
Diversity of using house surroundings	5.4	5.2	7.6	5.1	6.0	6.4	7.3	7.5	7.5	5.7	7.8	4.7	3.6	4.5	4.5	9.0	6.0	8.6	7.6	6.9	8.1
Adaptation to the immobile	5.0	4.3	7.9	5.4	6.5	6.8	8.7	8.2	6.6	5.2	7.0	7.2	4.3	6.3	5.7	7.2	5.3	4.3	6.1	5.9	7.3
Feel of home	6.8	7.5	8.3	8.8	7.4	6.9	8.3	7.4	7.5	7.3	6.7	7.4	6.1	6.1	6.8	8.8	7.5	6.8	8.3	5.4	8.2
Pleasant view	5.1	5.1	6.1	9.0	6.0	5.7	7.1	6.3	6.6	4.3	5.8	7.2	4.3	5.2	5.9	7.5	7.0	7.0	6.9	7.6	6.8
Feel of privacy restrictions	3.0	3.2	3.6	4.0	3.6	3.0	4.1	3.6	4.1	3.3	4.1	3.8	3.2	3.2	3.5	4.3	3.7	3.7	3.4	4.0	3.5
Perception of aesthetic qualities	7.3	6.8	8.3	8.9	7.5	7.2	7.7	7.3	5.9	6.6	6.8	7.0	6.4	7.3	7.0	7.8	7.2	7.6	8.3	6.4	8.2
Moving – change of neighbours	3.9	4.2	7.4	8.1	7.0	6.5	7.7	7.4	6.1	5.5	7.3	6.2	5.7	4.5	5.0	7.5	5.1	8.0	8.4	6.9	7.7
Long-term residence	8.5	7.9	8.7	9.4	9.8	9.6	7.8	8.2	6.4	7.5	6.0	7.8	9.4	9.0	9.5	6.6	7.1	8.8	7.9	8.7	9.3
Neighbourly relationships	7.4	7.0	7.9	7.8	7.1	6.5	7.7	7.9	7.5	7.5	6.7	7.9	6.1	6.8	6.9	8.1	6.8	7.5	8.1	5.8	8.1
Participation in maintaining premises around the residence	4.0	4.0	4.9	4.9	4.2	3.5	3.8	4.0	3.4	5.9	4.6	4.7	5.7	3.5	5.2	5.0	5.8	5.2	7.0	3.0	4.1
Satisfaction index	**89.9**	**87.7**	**106.9**	**105.2**	**98.7**	**93.8**	**107.5**	**102.8**	**97.7**	**91.7**	**92.7**	**96.4**	**82.5**	**87.8**	**89.7**	**106.8**	**91.2**	**101.1**	**105.2**	**89.7**	**107.4**

Subjective feeling of health condition is largely at a good level except for Localities OS4 (Poruba-dvouletky), OS6 (Poruba prefabricated housing estate), and ZL1 (Zlín centre), where the residents gave 5.0 – 5.9 of the 10 points possible.

None of the localities was perceived as distinctly dangerous by the respondents who designated Locality OS2 (blocks of apartment houses on the perimeter of the centre) as the most dangerous by night (3.3 points).

Untrustworthy strangers, homeless persons, and beggars occur particularly in the historical core of Brno (BR1) as well as in Localities OS2, OS3 (wider centre of Ostrava) and OS4 (Poruba dvouletky), where the indicator is below 3.0.

All respondents considered their domicile as a "good address"; a negative evaluation was not given. Localities with the highest scores (≥ 8.0 points) were BR1 (historical core), BR2 (blocks of flats in the wider centre), BR3 (low-rise housing development Královo Pole), BR4 (Masaryk Quarter) and BR7 (satellite Česká) in Brno, and Localities OS1 (centre of Ostrava), OS7 (satellite Polanka nad Odrou) in Ostrava and ZL4 (Obeciny apartment houses) and ZL6 (Kostelec) in Zlín. In the same localities, the respondents most often expressed to perceive a strong feel of home and very good neighbourly relationships.

In all localities, the availability of civic amenities is at a comparable moderate or above average level (5.0 – 7.3 points).

Respondents from Localities BR3 (low-rise development Královo Pole), OS2 (blocks of flats near the centre of Ostrava) as well as those living in the satellites (BS7-9, OS7, ZL6) report very diverse activities in the surroundings of their houses (between 7.5 and 7.8 points). At the same time, the residents consider these localities sufficiently accommodated to immobile. In Zlín, the diversity of using the house surroundings for various activities has high scores in Locality ZL3 ("Letná") - 8.6 points.

The strongest feel of home (>8.2 points) is reported from Localities BR3 (Královo Pole), BR4 (Masaryk Quarter), BR7 (Česká), ZL4 (Obeciny apartment houses) and ZL6 (Kostelec).

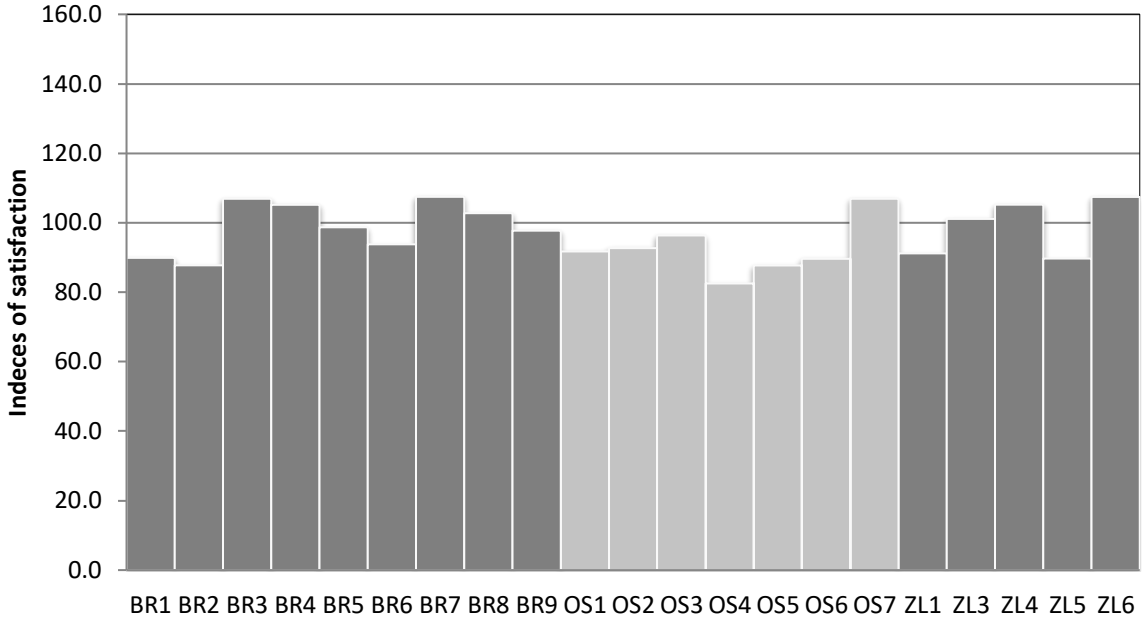
Pleasant view has the far best score in the Masaryk Quarter in Brno BR4 (nearly 9 points), whereas all other localities reach max. 7.5 points (OS7, ZL5).

Considerably restricted privacy is felt largely by respondents living in localities with a higher built-up index (<3.3 points: BR1, BR2, BR6, OS1, OS4, OS5).

Localities with the environment of high aesthetic quality are BR3, BR4, ZL4, and ZL6 (>8.1 points). These localities as well as ZL3 exhibit some other common phenomena: neighbours are changing only rarely, people live there for a longer time – on average more than 8.8 years (Ø value of the indicator of "long-term residence" is 8.8 points in these localities) and neighbourly relationships are of above standard nature. Notable is the fact that compared with all the other localities, the housing estates of Bystrc and Vinohrady in Brno (BR5 and BR6) reach the highest points in terms of "long-term residence" (9.8 and 9.6 points, respectively).

Willingness to participate in the maintenance of areas around their houses is the highest in respondents from localities of diverse urban character in Ostrava and Zlín: OS1, OS4, OS6, OS7, ZL1, ZL3 and ZL4 with ≥ 5 points (ZL4 even 7.0 points).

Graph 2: *Indexes of satisfaction in surveyed localities*



Source: authors

Indices of satisfaction presented in Graph 2 and Tab. 2 reach the highest scores (101.1 – 107.5 points) in localities situated outside the city centre: BR3, BR4, BR7, BR8, OS7, ZL3, ZL4 and ZL6. In the central parts of the cities (BR1, BR2, OS1, and ZL1), the scores range from 87.7 – 91.7 points with even two housing estates in Brno – Bystrc and Vinohrady (BR5 and BR6) reaching higher scores (98.7 and 93.8 points resp.) than the centre of Brno. High scores were given to the already mentioned locality ZL4 (Obeciny - linear apartment houses). However, this locality recorded a distinct population decrease in the period from 2001-2011 (- 19.3 %) and statistical data from 2011 indicate a considerable predominance of seniors over children (67/33). These unfavourable trends can be confirmed or disproved only by the census to be held in 2021. An opposite phenomenon was observed in satellites BR8 and OS7 with high residential satisfaction, in which an extreme increase of population and a distinct predominance of children over seniors were recorded.

4. Summary of the results

Results of the analysis of residential satisfaction suggest that less satisfied people live in the central parts of the surveyed cities. The highest *Indices of satisfaction* (101.1 – 107.5 points) occur in the localities (BR3, BR4, BR7, BR8, OS7, ZL3, ZL4, ZL6) with some common characteristics:

- low-rise residential developments beyond the city centre perimeter,
- urban concepts of dispersed city/garden city or low-rise housing developments with gardens and other green areas,
- high scores in these localities were obtained thanks to the aesthetic qualities of the environment, safety, home feeling, and good neighbourly relationships.

Moreover, the overall results (Graph 2) suggest another interesting fact that the position of prefabricated housing estates in Brno (BR5 and BR6) is more favourable than that of housing

estates in Ostrava and Zlín (OS6 and ZL5). The housing estates in Brno reach average scores of 96.2 points, a city centre 88.8 points, a satellites 102.6 points (with larger differences between BR7, BR8, and BR9). Residential satisfaction in the surveyed Brno housing estates is higher than in the centre, and at the the same time at approximately same level as in the most remote Brno satellite BR9 (97.7 points). By contrast, residential satisfaction in the housing estate in Ostrava is lower than both in the city centre and in the satellite (89.7 x 91.7 x 106.8). Moreover, in Zlín, the population living in the housing estate is less satisfied than that living in the city centre and in the satellite (89.7 x 91.2 x 107.4). The specific position of housing estates in Brno shows a specific partial factor, too. The level of long-time residence expressed by respondents in the questionnaires in 2018 is still very high, in fact the highest if compared with all other localities.

The surveyed demographic parameters of local populations show that the localities with higher residential satisfaction are inhabited by the above average number of persons with higher than basic education (Tab. 1, index ISCED 3 and higher), with the potential of higher income and lower unemployment. This particularly applies to Localities BR3 and BR4 in Brno (low-rise housing or residential development) with the highest education standard of all localities compared (92.8 %; 93.8 %). An exception from the rule is the Zlín locality from the period of the 1st Czechoslovak Republic (ZL3), where the representation of persons with higher than basic education (ISCED3 and higher) is below the national average (82.2 %) as well as the share of university educated residents (16.5 %). A similarly a low share of residents with academic education lives in the Brno satellite BR8 (17.8 %; BR9 even only 11.4 %); however, these data may be distorted due to the inclusion of older built-up areas in the village into the statistics.

The overall results further show that the least population loss between the years 2001 and 2011 (4.9 % and 1.8 %) occurred in Localities BR3, BR4 with high residential satisfaction (low-rise housing estates and residential development in Brno). On the other hand, the highest loss of population (>15 %) was as a rule reported from the localities with lower residential satisfaction (OS3, OS5, and ZL5). An exception from this rule is Locality ZL4 (population loss 19.3 %), in which the residents expressed high satisfaction (over 100 points).

Our survey revealed some other interesting facts, too. The Brno localities with the highest residential satisfaction, small population loss, and higher education standards (BR3 and BR4) are inhabited mainly by seniors who distinctly predominate over children. However, the situation in the Brno satellites with high residential satisfaction and moderate or lower (university) education (BR7-9) is the opposite. The share of seniors and children in the Brno housing estates BR5 and BR6 with relatively favourable scores for both residential satisfaction and education is very well balanced. By contrast, the housing estates in both Ostrava and Zlín (OS6 and ZL5) have a greater share of seniors than children.

5. Conclusions and discussion

The results confirmed that there is a relation between the satisfaction of residents and a type of the urban structure as presupposed (section 4. Summary of the results). The satisfaction relates to objective (material) factors which can be statistically defined but also to the subjective feelings of residents. This subjective part of satisfaction could be connected with the residential preferences of individual population slides and groups on the one hand, and with the fashion (general societal feeling about what is “in“) created by media, social networks and similar factors on the other hand.

It was also partly confirmed that the population with higher education prefers most often low-rise and often dispersed residences in green areas where people feel better. People seem to especially value social contact, safety, and attractive neighbourhood within the good quality of the environment in their residential satisfaction (as described by Buys & Miller, 2012; Galster & Hesser, 1981; Lovejoy et al., 2010; Lu, 1999).

A methodological problem may be that due to the availability of statistical data, the education level (a part of the human capital) in our research partly substitutes other categories such as wealth or power position, which is not always the same. According to the investigation of Czech sociologists (Prokop et al., 2019), the two upper social classes differ. The secured middle class disposes of wealth but has typically weaker human capital. By contrast, the cosmopolitan middle class has a high level of capital except for property. In the first mentioned case, the dwelling serves to express prestige, wealth, and power, whereas the cosmopolitan middle class rather looks for the dwelling to be satisfactory for their life and activities including less dependence on their place of living, which can lead to the preference of apartments instead of houses.

In the past, suburbanization trends were typical of European big and middle size cities. This trend leads to a population decrease in inner cities. However, will this trend continue also in the future? Moos and Revington (2016) show that the generation of millenials (Generation Y) starts to prefer urban dwellings. If the trend is confirmed, it could mean an opposite trend, i.e., population increase in cities where the quaternary sector is sufficiently developed.

A relatively high level of satisfaction has been gained in the housing estates in Brno. It may relate to the general situation of the city's housing market. With a significant shortage of flats, the residents of Brno appreciate housing estates too. This can be attributed to the location of most of the Brno housing estates nearby large forests and with very good public transport. In general, the expected depopulation of Czech prefabricated housing estates has not been confirmed.

Dissatisfaction with the residential milieu can theoretically lead to emigration to better perceived places. The problem is that dissatisfaction with the residential area is not always the main motivation for migration. Next study might be focused on the different motivations of residents for changing their place of living. There are multiple different motivations to be assumed for leaving an urban structure and moving to another one, e.g., economic reasons (especially in Brno, rent and real estate prices), sociological reasons (young people are leaving to break free from their parents' control), change of professional career (moving to Prague, abroad or to rural areas on the other hand) or dissatisfaction with the original residential area (due to environmental, social or reputation reasons). It is evident that apartments are less migration-stable than detached houses. Additionally, in Ostrava, the structural change of the city's economy might push out people who lost their jobs. Regional peripherality can play a similar role in Zlín.

On the other hand, there are factors defending emigration even if the residents are less satisfied with their urban structures. We can mention economic reasons (missing financial sources), inertia (Czechs are not used to changing their permanent address several times in their lives), and some sentiments (feeling home, social relations etc.). That is why the predicative capacity of the migration indicator is limited.

The research was based on relatively old statistical data originating from the last population census (2011). It is not possible to gain more recent statistical data earlier than after the 2021 census. Therefore, it will be useful to carry out similar research after 2021. The data obtained will reveal longer-term development trends.

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