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QUALITY OF LIFE IN THE URBAN ENVIRONMENT OF BRATISLAVA: TWO TIME-SPATIAL PERSPECTIVES

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Central to the interest in quality of life (QOL) in this paper is research into the relationship between people and their everyday urban environments. The paper explains the geographical approach to research into urban quality of life in the city of Bratislava. Two exemplar case studies are employed to illustrate the application of the multidimensional geographical perspective in a changing real urban context. The first case study analyses the situation in the 1980s, while the second one concentrates on living conditions in the city at the beginning of 21st century. This study shows that in spite of some similarities there has been some shift in the quality of life in the intra-urban structure of Bratislava since 1980.

Key words: quality of life, intra-urban structure, urban change, Bratislava

INTRODUCTION

The spatio-structural studies of cities applying the quality of life concept represent an extremely interesting but also "problematic" challenge for urban-geographical research. Rather problematic is the considerable plurality in interpretation of the quality of life concept (notion) but also the complexity and interdisciplinary character of the studies, both of the quality of life and the inner structure of a city. Connection of these two subjects into a single research theme runs into a number of obstacles both on the theoretical/methodological and ap-

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plied levels. In spite of this, the interest of the public and scientists in research in this particular field constantly increases. There are several causes of this trend. One important cause is the general dissemination of the quality of life concept and the related social demand for knowledge about the spatial differentiation of its level.

Research into the internal structure of a city in the light of quality of life also offers the option to extend the level of "here and now" to "here before and here now". It means application of a meaningful temporal comparison of knowledge concerning spatial differentiation of the same territory in terms of the quality of life in two different periods.

Precisely the attempt to realize such an idea is the principal aim of this paper. It is based on the results of two studies involved with the objective dimension of the quality of life or living conditions in the territory of Bratislava. They were realized, applying the practically the same methodology, in two different periods. The temporal gap between their data is twenty years.

The studies are analogues, to a certain extent, of the factorial ecology approach (e.g. Sweetser 1965, Węcławowicz 1975 and 1988). They are based on the assumption that each city is characterized by a certain quality of life structure at a certain time. Humans indirectly perceive this structure though it is not immediately observable or measurable. Its main properties are manifested through interdependencies between some measurable variables, which display similar spatial distributions.

The objective of these two studies was to identify the character of quality of life spatial differentiation in Bratislava. It means finding the principal dimensions, the generalizing characteristics, which summarize the substantial traits by means of fewer variables. The studies do not aspire to explore the city in its overall spatial complexity. They rather focus on research into selected spatial aspects of quality of life differentiation. The selection of input variables took into account only substantial and in terms of measurability accessible quality of life characteristics.

INNER STRUCTURE OF THE CITY IN TERMS OF QUALITY OF LIFE – A BRIEF REVIEW OF RELEVANT LITERATURE

Several studies have focused on the inner urban spatial differentiation of quality of life or its selected components. For instance, Pacione (1986) investigated quality of life in Glasgow at three levels: macro level – whole city, middle level – sub-ward and micro level – local. At macro level, he applied principal component analysis to a set of 59 variables (objective indicators) in order to evaluate quality of life in the framework of 2,435 spatial units. Türksever and Atalik (2001) were involved with quality of life research in 22 districts of Istanbul. Studies evaluating quality of life in 124 census units of Sao Carlos (Mendes and Motizuki 2001) or those studying quality of life in urban quarters of Bristol (McMahon 2002) are also interesting.

Studies containing information relevant to the quality of life of urban populations also exist in Slovak literature. The theoretical studies of Matlovič (1998, 1999 and 2002) include among other things the interesting idea of applying the concept of living conditions or quality of life to a complex interpretation of the

spatial structure of a city. The basic prerequisite in this case is the multi-criterion assessment of the urban space divided into the corresponding observation units. The decisive portion of work at the level of the applied research concentrates upon the territory of Bratislava. This trend does not surprise. Bratislava, as the Capital of the Slovak Republic is the biggest city at the top hierarchic level where comprehensiveness, varied functions, spatial differentiations, rate of interactions or occurrence of varied social, economic, ecological and other tensions is expected (Divinský 1999). Although many studies do not directly show interest in quality of life research, sometimes they draw close to the subject (e.g. Mládek 1994, Spišiak 1994, Slavík 1994, Ira 1998, 2001 and 2003, Korec and Smatanová 1999 and 2000). Factorial ecologies of Bezák (1987), and Korec and Ondoš (2006) also suggest rather a strong relation to quality of life research, especially as far as the socio-economic characteristics of the population are concerned. An interesting group of studies was written at the turn of the 1970s and the 1980s at the Department of Regional Geography of the Faculty of Sciences, Comenius University. Their subject and methodology largely corresponded to the present interpretation of quality of life research. Practically, the only important difference existed in terminology, which did not use the term quality of life, but replaced it by an other, then more acceptable term "the environment". The quoted group includes works of Ira and Paulov (1976), Bašovský et al. (1981) and Ira (1984). Works explicitly involved with quality of life research and applying the relevant terminology started to emerge in the national specialized literature in the last decades. The geographically oriented ones include the study of Spišiak and Danihelová (1998), which concentrated on questions of quality of life in the suburban space of Bratislava. They applied 33 objective and subjective indicators and the Ball method. Works dealing with the internal structure of the city in terms of quality of life (Andráško 2004, 2006a, 2006b, 2007, Ira 2002, 2004, 2005, or Ira and Šuška 2006) deserve special attention.

THEORETICAL AND METHODOLOGICAL FRAMEWORKS OF THE STUDY INVOLVED WITH LIVING CONDITIONS IN BRATISLAVA

The principal objective of this paper is to compare the knowledge about quality of life in the city of Bratislava obtained in two different periods. As the theory of the subject was treated by for instance Massam (2002), Pacione (2003), Bacsó (2007) or the authors of this paper (Ira and Andráško 2007), the dual structure of quality of life, namely its two dimensions: objective and subjective, will be briefly summarized. Probably the most important approach in research on the objective quality of life dimension is the study of the quality of living conditions. Some authors even equate the concepts of quality of life and that of living conditions (Borthwick-Duffy 1992). Although we do not adhere to such an approach, living conditions are important as they determine the quality of the everyday life of humans. The origins and use of some meta-concepts (van Kamp et al. 2003) of the term *quality of life*, are closely connected. They include, for instance, liveability/habitability (for instance Pacione 1990), quality of place (Marans 2003), or environmental quality (Bonaiuto et al. 1999; Pacione 2003). The living conditions, the quality of which is studied, are identified in

the areas of human life, which can be considered the key ones. Several authors have addressed these problems in their works (e.g. Bowling 1995, Felce and Perry 1995, Dissart and Deller 2000). According to Andráško (2005), the key areas of the settlement-related, or urban quality of life, are above all housing, the environment, crime, rate transport and amenities. Subsequently, often in the limiting confrontation with the availability of data, it is possible to specify the relevant quality of life indicators or those of living conditions.

Regarding the above-mentioned facts, the multi-criterion method for the assessment of living conditions in the delimited observation units will have to be applied. While taking into account some problems that may emerge, multivariate statistical methods seem to be the most appropriate ones (see for instance Andráško in print). Such methods include specifically principal component analysis, cluster analysis or discrimination analysis used in compilation of the regional typology of spatial observation units in the two studies specified.

BASIC SPATIAL UNITS, CHARCTERISTICS OF QUALTY OF LIFE AND THE USED METHODS

The first of the two compared studies is the one that is based on research conducted in the 1980s (Ira 1984). Its object was the city of Bratislava delimited by the administrative boundaries as of the 1980 Census. Considering the network of urban wards and taking into account the criteria set in advance, 50 observation territorial units – city quarters were sorted out. Each quarter was subsequently characterized by 38 variables, indicators representing their residential/housing level, land use, some aspects of the environment (exhalants, noise, greenery) and selected characteristics of social and transport infrastructure (Tab. 1 brings the review of variables).

The method of principal component analysis was applied to the 38 × 50 matrix (values of variables for each spatial unit); 38 orthogonal components were extracted and arranged according to their share in overall variance. The first four covering more than 50 % of variance (Tab. 2) were selected for further interpretation.

The distribution of component values in the study area is characterized by the component score values. The interpretation is facilitated by component loading values, which agree with the correlation coefficients and the original variables. Only variables with absolute values of component loadings higher than 0.5 were taken into account.

After more than a 20-year interval, the study of the quality of living condition in the territory of Bratislava (Andráško 2007) has been produced. Its content and methodology are the follow-ups to the above-mentioned paper (Ira 1994). The author delimited 75 city quarters based on criteria specified in advance and the existing network of urban wards as of the 2001 Census. The basic data set characterizing each of these quarters represented data for 28 variables (Tab. 3). They covered several key quality of life areas: housting, environment, amenities, accessibility of the city centre, and crime. Like in the previous study, analysis of principal components was applied to the basic matrix, and its result was the extraction of 28 orthogonal components. Regarding the order according to the share in the overall variance, the first four of these components, which covered in total 63.7% of variance (Tab. 4), will be dealt with briefly.

Tab. 1. List of variables in the principal component analysis (1980)

No.	Name and definition of the variable
1	Population density (number of permanent inhabitants per 0.01 km² of built-up area)
2	Dwellings built in 1920-1945 (share of dwellings built in 1920-1945 of total permanently inhabited dwellings)
3	Dwellings built in 1946-1960 (share of dwellings built in 1945-1960 of total permanently inhabited dwellings)
4	Dwellings built in 1961-1980 (share of dwellings built in 1961-1980 of total permanently inhabited dwellings)
5	Dwellings of the 1st and 2nd category (share of dwellings of . category I and II of total permanently inhabited dwellings)
6	Dwellings of the 4th category (share of dwellings of category IV of total permanently inhabited dwellings)
7	Living area per inhabitant (mean living area of total permanently inhabited dwellings per inhabitant)
8	Number of inhabitants per one 1 habitable room (mean number of inhabitants per 1 habitable room)
9	Dwellings with water main (share of dwellings with water main of total permanently inhabited dwellings)
10	Dwellings connected to sewage (share of dwellings with connection to public sewage of the total permanently inhabited dwellings)
11	Accessibility of the city centre (mean time necessary to reach the city centre by public transport)
12	Accessibility of public transport (share of areas with accessibility of public transport stops below 5 min.)
13	Congestion by road traffic ((Σ number of vehicle units in 24 h × length of communication)/area in v km²)
14	Noise contamination by traffic (length of communication with exceeded acceptable noise level corresponding to 1 km ² of area)
15	Dwelling areas (share of dwelling area in total area)
16	Areas of amenities (share of amenity areas of total area)
17	Industrial, construction and warehouse areas (share of total area)
18	Transport areas (share of total area)
19	Forest areas (share of total area)
20	Agricultural areas (share of total area)
21	Water bodies (share of total area)
22	Recreation and sport areas (share of total area)
23	Unused and devastated areas (share of total area)
24	Built-up areas (share of total area)
25	Mean public greenery per inhabitant
26	Mean greenery per inhabitant
27	Mean sport area per inhabitant
28	Dust fallout over 150 t per km² a year (share of areas with dust fallout over 150 t per km² a year of total area)
29	Dust fallout over 350 t per km² a year (share of areas with dust fallout over 350 t per km² a year of total area)
30	Concentrations of SO_2 over 30 mg v m³ (share of areas with mean annual concentration of SO_2 over 30 mg in m³ of total area)
31	Concentrations of SO_2 over 60 mg v m³ (share of areas with mean annual concentration of SO_2 over 60 mg in m³ of total area)
32	Level of saturation with elementary schools (number of places per 1,000 population)
33	Level of saturation with kindergartens (number of places per 1,000 population)
34	Level of saturation with crèches (number of places per 1,000 population)
35	Commercial facilities – food (mean area of groceries per 1,000 population).
36	Catering facilities (mean marketing area per 1,000 population)
37	Barbershops and hairdresser's (number of working places per 1,000 population)
38	Laundries and dry cleaner's (number of working places per 1,000 population)

Distribution of component values in the study area is characterized by the values of the component score. The interpretation is facilitated by component loading values, which agree with correlation coefficients and the original variables. Only variables with absolute values of component loadings higher than $|\pm 0.5|$ were taken into account.

INTRAURBAN STRUCTURE OF BRATISLAVA IN TERMS OF QUALITY OF LIFE AT THE BEGINNING OF THE 1980S

The first component enlightened less than a fifth of the overall variance and as Tab. 2 shows it was very closely connected with the variable describing the density of urban fabric and of population, air pollution, road traffic and its negative effects, accessibility of the city centre by public transport and the character of land use. High component scores were reached by spatial units with a high share of built-up areas, high share of areas with mean annual SO_2 concentration above 30 mg per m^3, with high share of areas with emissions of particulates above 350 t per km^2 a year, high loading by road traffic and noise, high share of residential areas with high share of dwellings connected to sewage, high share of areas with social infrastructure, high share of sport and recreation areas, high population density and a high share of areas with mean annual SO_2 concentration above 60 mg per m^3. On the other side, low concentrated scores were linked to spatial units characterized by a high share of agricultural land and a considerable accessibility of the city centre. The quoted characteristics made possible to interpret the first component as the dimension of *negative urban effects concentration.*

Tab. 2. Components and component loads (1980)

Component and variables	Component load
Component I	
Built-up areas	+0.86
Mean annual concentration of SO_2 over 30 mg in m^3	+0.83
Dust fallout over 350 t per km^2 a year	+0.74
Congestion by road traffic	+0.70
Noise contamination by road traffic	+0.70
Dwelling areas	+0.66
Dwellings connected to sewage	+0.60
Areas of amenities	+0.57
Recreation and sport areas	+0.56
Population density	+0.53
Accessibility of the city centre	-0.80
Agricultural areas	-0.88
Component II	
Dwellings of the category IV	+0.90
Number of inhabitants per habitable room	+0.78
Dwellings built in 1920-1945	+0.57
Dwellings with water main	-0.94
Dwellings of the category I and II	-0.81
Dwellings connected to sewage	-0.68
Component III	
Level of saturation with crèches	+0.94
Level of saturation with kindergartens	+0.81
Level of saturation with commercial facilities – groceries	+0.78
Public greenery per inhabitant	+0.62
Component IV	
Dust fallout over 150 per km^2 a year	+0.71
Forest areas	-0.80
Forest areas per inhabitant	-0.84

The component score of the first dimension according to individual spatial units is depicted in Fig. 1. All spatial units with high positive values representing unfavourable impacts of human activities on the urban environment were in central part of the city and its northern and eastern edges. Proceeding from the city centre to its edges, the value of the component score gradually decreases. The highest negative values reflecting the low concentration of negative environmental impact were on the edges of the city, particularly in the former villages agglomerated to the Capital in several stages since the end of the Second World War (Devín, Devínska Nová Ves, Záhorská Bystrica, Rača, Vajnory, Vrakuňa, Podunajské Biskupice, Jarovce, Rusovce and Čunovo). Analysis of the distribution of values under the first dimension points to the concentric-zone tendency in arrangement of the inner city structure. New quarters in the east of the city, Dolné Hony and Medzi Jarky constituted an exception because of their land cover and comparatively high traffic loading.

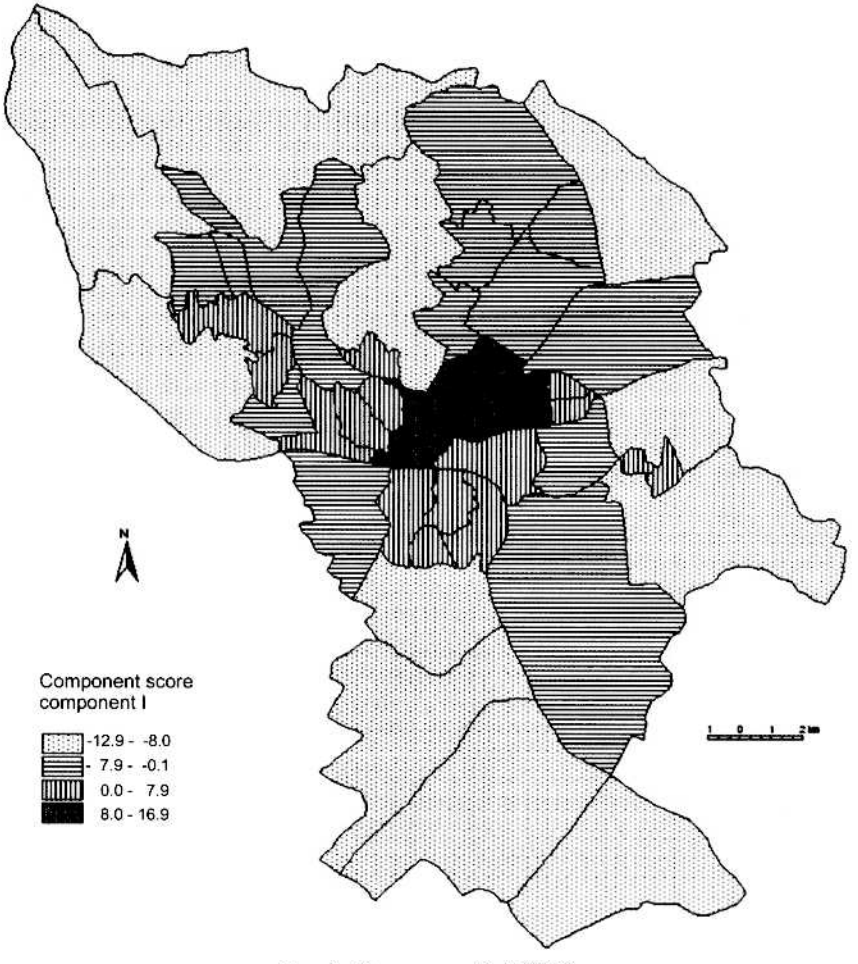

Fig. 1. Component I (1980)

Tab. 3. Mean component values for 14 regional types of city quarters (1980)

Type	Number of quarters		Components									
	Absolute	Relative (%)	1	2	3	4	5	6	7	8	9	10
A	1	2	16,9	-1.1	-1.3	2.0	-22.5	0.7	-0.8	-1.8	4.1	-0.9
B	8	16	9.1	-3.7	-0.8	2.9	-2.1	-0.8	-1.0	-0.8	1.1	0.7
C	3	6	13.6	-1.7	-0.7	3.4	-9.7	2.6	-3.3	-0.6	3.5	-2.9
D	1	2	2.2	6,9	-0.4	0.5	0.7	7,9	5.9	0.4	0.8	-2.1
E	14	28	1.7	-4.1	-0.5	1.9	2.3	-2.5	-0.9	0.1	-1.8	1.7
F	7	14	-5.1	-0.4	0.6	-0.9	1.4	0.9	-0.4	1.0	-0.7	-0.2
G	7	14	-10.0	5.8	-1.0	-1.8	2.9	1.0	1.0	0.8	0.2	-1.0
H	1	2	-5.5	0.7	21.8	-3.7	-3.0	5.4	2.4	1.9	-2.3	-3.7
I	1	2	-0.8	-0.4	2.4	0.0	1.4	7,9	3.0	-0.5	-2.7	2.3
J	2	4	-6,7	2.1	0.4	-11.2	0.0	0.5	0.4	0.8	2.3	-0.7
K	1	2	2.7	-1.3	-1.8	-1.0	-0.7	0.7	6,3	-1.3	1.5	-2.4
L	2	4	-11.6	10.3	1.2	-7,6	2.4	0.2	2.4	0.8	0.1	-3.0
M	1	2	1.3	10.7	-2.9	0.5	0.5	0.2	1.5	0.3	3.1	2.5
N	1	2	-11.3	4.7	-2.2	-2.0	1.8	-0.6	1.9	-7,5	1.2	-2.8

Tab. 4. List of variables in the principal component analysis (2001)

No.	Name and definition of the variable
1	Dwellings of the category I and II (share in the total number of permanently inhabited dwellings[1])
2	Dwellings of the category IV (share in total number of permanently inhabited dwellings)
3	Dwellings in family houses (share in the total number of permanently inhabited dwellings)
4	Dwellings built before 1945 (share in total number of permanently inhabited dwellings)
5	Dwellings built in 1946-1970 (share in total number of permanently inhabited dwellings)
6	Dwellings built in 1971-1990 (share in total number of permanently inhabited dwellings)
7	Area standard of dwellings (mean habitable area of permanently inhabited dwellings per person)
8	Occupancy of dwellings (mean number of persons per one habitable room)
9	Size of dwelling (mean number of habitable rooms per one permanently inhabited dwelling)
10	Accessibility of the city centre by public transport (mean time (in min.) necessary to reach the city centre by public transport [2] from all its stops)
11	Vandalism (share of reported cases of vandalism and night disturbance in a city quarter in the total number of such cases)
12	Public greenery (level of saturation with public greenery areas expressed as mean area of public greenery [3] (in m^2) per inhabitant)
13	Total greenery (level of saturation with public greenery areas expressed as mean area of total greenery[4] in m^2 per inhabitant)
14	PM_{10} (average of pollution category values by dust fallout)
15	Benzene (average of pollution category values by benzene)
16	SO_2 (average of pollution category values by SO_2)
17	General practitioners for adults (their number per 1,000 population at the age of 18 and over)
18	General practitioners for children and young persons (their number per 1,000 population at the age below 18)
19	Gynaecologists (their number per 1,000 females)
20	Stomatologists (their number per 1,000 population)
21	Classes in kindergartens (their number per 1,000 population at the age of 3-5 years)
22	Classes in elementary schools (their number per 1,000 population at the age of 6-15 years)
23	Pharmacies (their number per 1,000 population)
24	Banks (number of banks and their branches per 1,000 population)
25	Groceries (number of such shops – bread, meat, vegetables, fruit – per 1,000 population)
26	Clothes shops (number of fabric and clothes shops per 1,000 population)
27	Hairdresser's (their number per 1,000 population)
28	Catering facilities (number of restaurants, clubs, pubs, discothèques and similar establishments per 1,000 population)

[1] permanently inhabited dwellings, [2] public transport, [3] parks and areas of orchards, [4] public greenery, housing estate greenery, IBV greenery, school, educational and recreation greenery, gardens, cottage colonies, cemeteries, protective greenery.

The character of land use considerably influenced the spatial distribution of the negative urban effects dimension. Residential and service functions prevailed in the inner city with the high share of built-up areas. The great amount of local heating units along with the power plant and older industrial plants in its northeastern and eastern edges contributed to air pollution. The character of traffic was manifested in the fact that more than a third of passenger and freight traffic passed through the city centre or along its perimeter. The loading of the outer circuit communications represented as many as 25 thousand vehicles in 24 hours and the excess over the permitted noise level oscillated between 10 and 25 dB (A). On the contrary, the negative effects of traffic and industry are the least in the remote suburban wards with a high share of agricultural land.

The second component expressed one eighth of the overall variance. The analysis in Tab. 2 shows that the variables characterizing the housing pool distinctly participate in formation of the second dimension. Highly positive values of component loadings corresponding to individual variables formed together the dimension of the low quality housing pool, and on the contrary, the negative component loadings indicated the high quality housing pool. Units with a high share of dwellings classified into the 4th category with a high mean number of occupants per one room and with a high share of dwellings built in the 1920-1945 period rendered the high component score. Units with the high share of dwellings with water mains, a high share of the I and II category dwelling, with a high share of dwellings connected to public sewage and those built in the 1961-1980 period are marked by inverse characteristics of the component score. The above-mentioned fact reveals that it was distinctly profiled dimension of the housing pool quality

As is obvious from Fig. 2, the spatial distribution of the second component values represents the sector-mosaic arrangement of the inner city structure. Territories with high component score values concentrated above all in the city sector on the right bank of the river Danube (old part of Petržalka, Janíkov dvor, Jarovce, Rusovce and Čunovo), in the north-western sector (Devín, Devínska Nová Ves and Záhorská Bystrica), in the north-eastern edge of the city (Rača), eastern edge (Vrakuňa) and the central part of the city part (mixed industrial and transport/residential zone of Pálenisko). Another area with positive component score values was the not so densely populated northern sector (Patrónka, Koliba), southeastern sector (Prievoz, Vlčie hrdlo, Podunajské Biskupice), Šajby and Trnávka in the eastern portion of the city and on the right bank of the Danube River it was Kapitulský dvor. Older family houses prevailed in these spatial units. On the other side, units with negative score concentrated into sectors of new housing estates built in the 1960s and 1970s in the territories of Dúbravka, Karlova Ves, Ružinov, Podunajské Biskupice, Vrakuňa and Petržalka and in the space between the railway and Račianska Street.

The third component expresses more than a twelfth of the overall variance. This dimension grouped prevailingly the input variables that characterized the level of certain type of services. Analysis of component loadings (Tab. 2) shows that the typical features of spatial units with high values were: the elevated number of kindergarten vacancies, large mean area of grocery shops per 1,000 people and the high proportion of green areas per inhabitant. Low values of the third component indicated low parameters of the quoted characteristics. On the

basis of the most distinct variables, the third dimension was interpreted as the component of saturation with pre-school facilities.

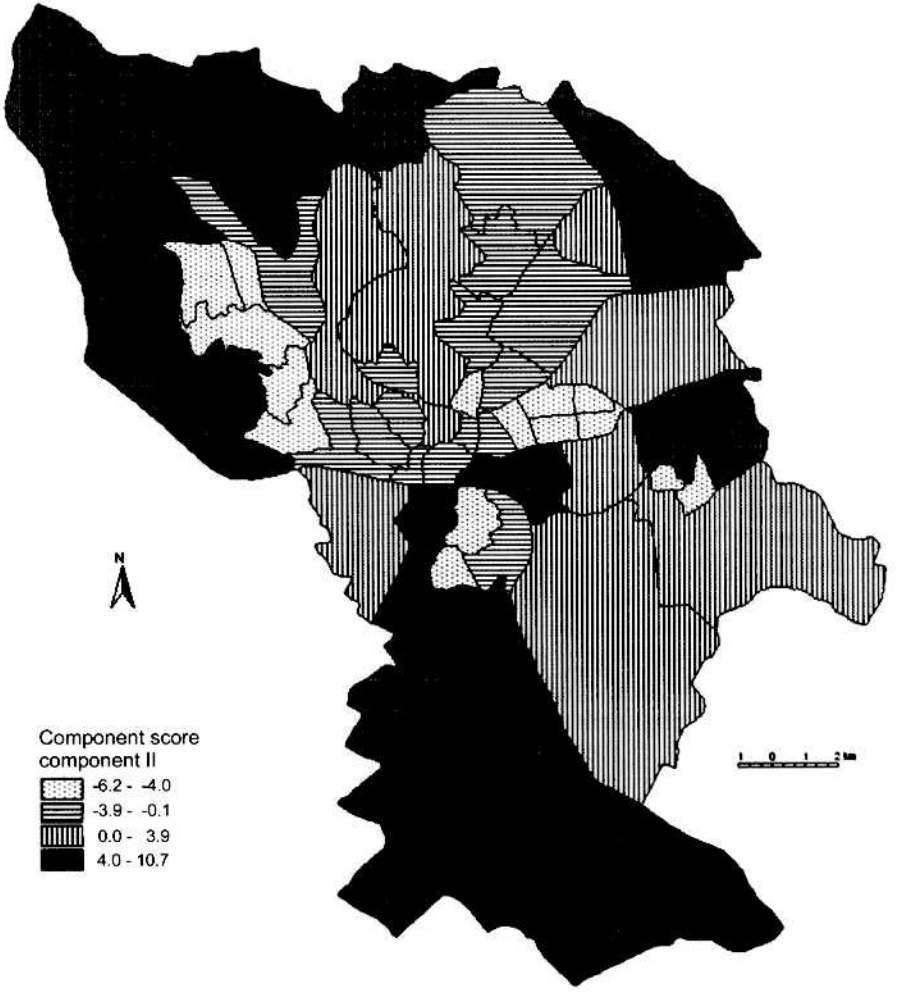

Fig. 2. Component II (1980)

Spatial distribution of the component score values is characteristic for its sector-mosaic pattern (Fig. 3). Positive values occurred in spatial units where (with the exception of Devín) pre-school facilities and shops were linked to large industrial plants. The lowest values were observed in Čunovo, Vrakuňa, Prievoz, Červený kríž and the old part of Petržalka.

The fourth component responsible for 7.75 per cent of explanation of the overall variance was denoted the component of saturation with sport and leisure areas. The forth dimension was saturated with variables: sport areas per 1 inhabitant, forest areas and emissions of particulates over 150t / km^2 / year.

Fig. 3. Component III (1980)

An evident difference between the central zone of the city and its periphery was observed (Fig. 4). The continuous zone with positive values covered the city centre and the adjacent eastern quarters. Low negative values mostly characterized the remoter zone of suburban quarters above all in the northern part of the study area. Interestingly, spatial units within the city tended to show a concentric-zone arrangement.

Regional types

The method of group distance averages was used in cluster analysis. The measure of difference (distance) between each pair of observations was the Euclidean distance squares. Results including the analysis of the original group of observations into 14 clusters were verified by discrimination analysis.

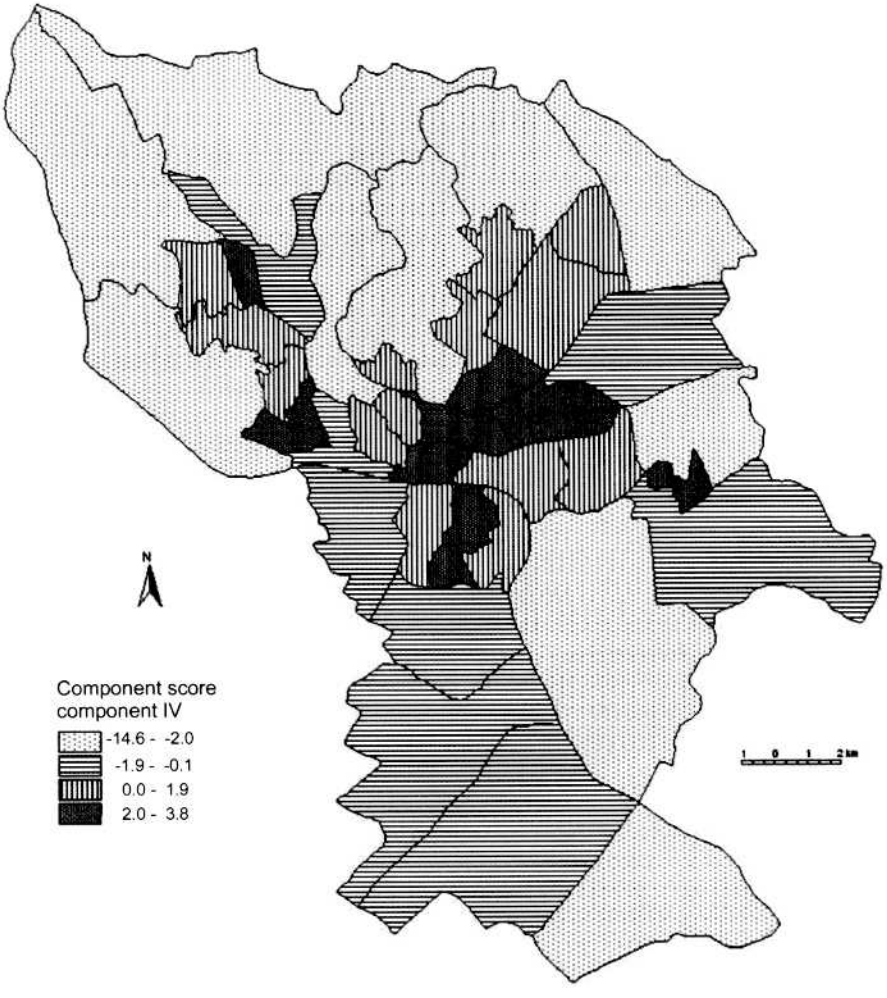

Fig. 4. Component IV (1980)

Fig. 5 documents the interpretation of cluster analysis. The figure shows that the quality of life was markedly differentiated in the study area. There was a tendency to form types represented by a single spatial unit (inner city, Pálenisko, Vlčie hrdlo, Janíkov Dvor, Mlynská dolina, old Petržalka and Čunovo), or types representing a small number (2) of spatial units, but also four typologically larger clusters of quarters with similar quality of life characteristics.

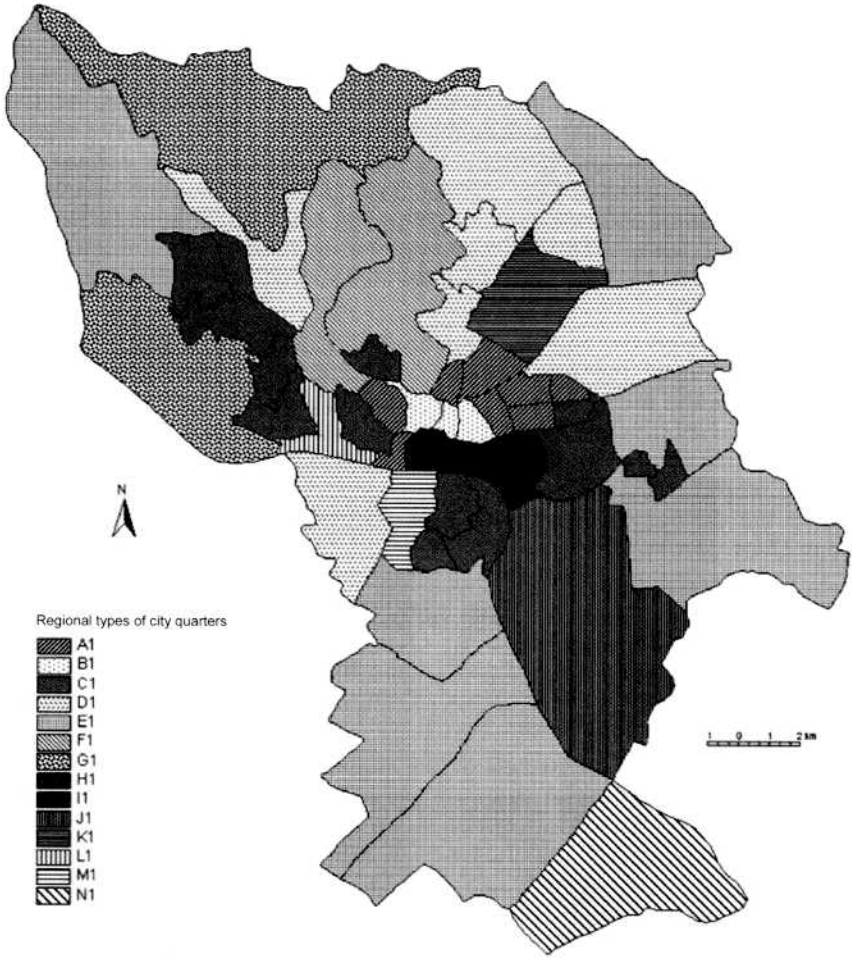

Fig. 5. Regional types of city quarters (1980)

Letters A1 to N1 mark fourteen delimited types of spatial units. A special category consists of individual spatial units, which were delimited as dissimilar from other spatial units of their clusters because of extreme values of some of the basic dimensions. Sorting out Mlynská dolina (L1) as an independent type was determined by low values of the fourth component (saturation with selected services). The industrial character of Jurajov dvor (K1) was characterized beside the average quality of the housing pool by the low level of saturation with some services. Pálenisko (D1) represented a spatial unit with a very low standard of housing, extensive areas of the port, industrial plants and a high share of water bodies. Vlčie hrdlo (J1) contained the extensive area of the Slovnaft refinery and thanks to the services established near the plant for its employees, it had a high level of saturation with pre-school facilities and groceries. The extremely high level of the dimension expressing the high share of transport, industrial,

construction and warehouse areas documents the suburban character of the environment in Jurajov dvor (K1) and Čunovo (N1). Concerning the area of the spatial unit, the accessibility of public transport reached extreme values. The specific nature of the inner city (H1), which fulfilled the function of the managing centre for the whole urban system, was confirmed. The dense network of interactions between system elements is also manifested by the high concentration of the negative urbanization effects. Its service function was characterized by extreme values of saturation with communal services. Due to the extremely high value of the component score corresponding to the second dimension, the old part of Petržalka (M1) was denoted as the type with low quality of the residential environment.

Type (E1) created the cluster of seven spatial units lacking any un ambiguous differentiation of the ten dimensions. Low values (favourable situation) were reached in the dimension of negative effects on the environment, and on the contrary the relatively high values (lower quality) characterized the dimension of the housing pool quality. This type was represented by Devínska Nová Ves in the western part of the city, by Vajnory, Vrakuňa, and Podunajské Biskupice in the east and by three parts of the transdanubian sector of the city (Janíkov Dvor, Jarovce, and Rusovce).

A high rate of similarity of 14 quarters (C1) mostly with housing estates (Pošeň, Prievoz, Medzijarky, Dolné hony, Kramáre, Červený kríž, Rovnice, Kútiky, Záluhy, Podvornice E and W, Ovsište NE and SE, and Starý háj) has been established by detailed analysis of the basic dimensions. The most conspicuous characteristics included high housing standards and low representation of transport and industrial areas.

The residential quarters of Gaštanový hájik, Trnávka, Krasňany, and Rača Šajby in the eastern sector of the city and Kapitulský dvor along with Lamač (D1) had in common lower values of the component score of negative urbanization effects (adverse effect) and the average quality of the housing pool.

The sector-mosaic pattern of the inner city structure represented the spatial arrangement of individual types.

THE INTRAURBAN STRUCTURE OF BRATISLAVA IN TERMS OF QUALITY OF LIFE AT THE BEGINNING OF THE 21ST CENTURY

The first extracted component accounts for approximately 27 % of overall variance. As the data in Tab. 4 suggests, as far as the content is concerned it is considerably saturated by variables, which characterize the level of public and commercial amenities in quarters. High component scores in this case were recorded in city wards with high to very high values of the corresponding variables or at least some of them. As far as the commercial amenities are concerned, spatial units with higher component score values can be characterized by high number of banks and their branches, hairdressers' or beauty parlours, groceries, and public catering establishments per 1,000 population the quarter. Higher values of component score also indicate relatively high proportions of permanently inhabited dwellings built before 1945, dwellings of category IV or higher levels of saturation with areas of selected categories of greenery. The situation is just the opposite in quarters with low component score values.

The spatial arrangement of the component value scores is shown in Fig. 6. The tendency to sector-mosaic arrangement of values occasionally with regard to the inner and central zones of the city as well as the tendency to concentric-zone arrangement is obvious. The concentration of quarters with high component score values in the inner zone, or high score values of quarters spatially linked to this group within the central zone of the city (Podhradie, Prístav, Pasienky) corresponds to it. The lowest score values are linked above all to the residential areas of estate type laying within the central to peripheral city zones. They are the housing estates in the territory of the city quarters Petržalka, Ružinov, Vrakuňa, Rača, Karlova Ves, Dúbravka and Devínska Nová Ves.

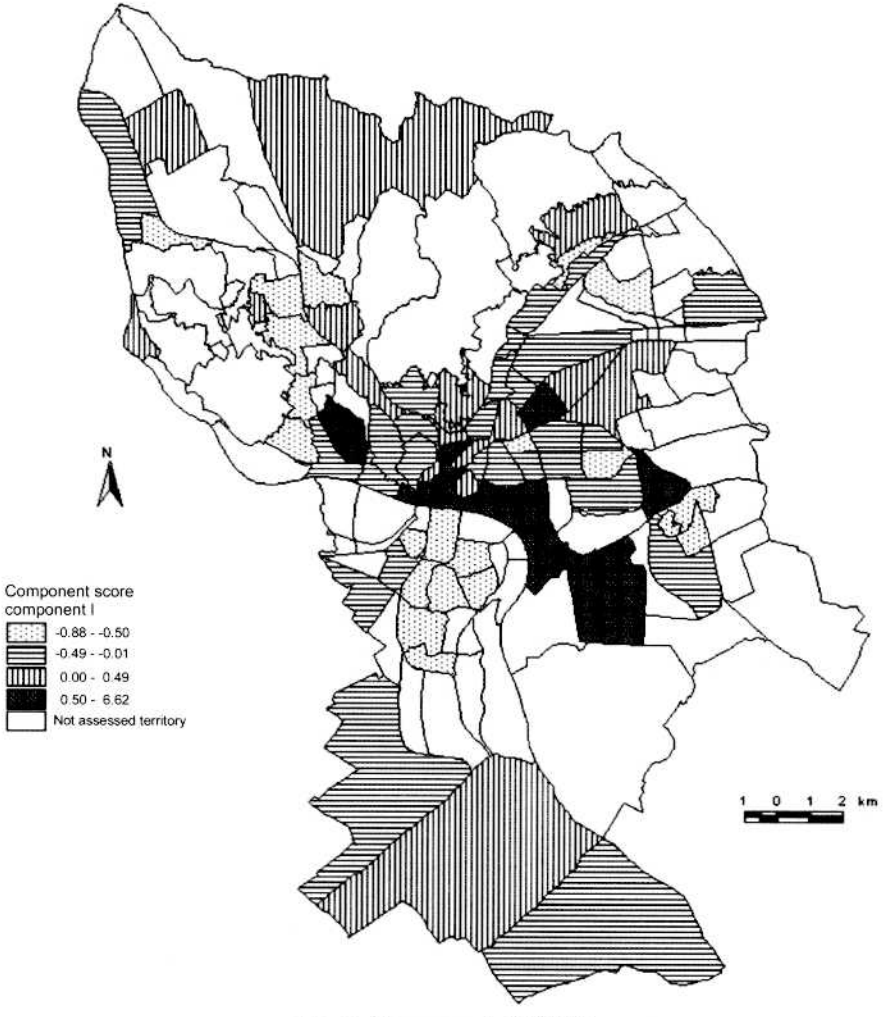

Fig. 6. Component I (2001)

The research results in the case of the first component suggest that the score values were markedly influenced by the population number in individual quar-

ters. The lowest values were observed in quarters characterized by a high concentration of permanent inhabitants and lower numbers of amenities. With regard to the applied variable, the relevance of results in case of this component is relative and requires deeper estimation of their significance. This question will be dealt with in more detail in the following parts of the paper.

A lower share (16.9 %) in overall variance is attributable to the second component extracted in the principal component analysis (Fig. 7). Regarding the absolute values of component loadings higher than 0.5, it is characterized by variables covering the residential domain. These are complemented by variables describing the level of air pollution or time accessibility of the city centre. High values of component score were found in quarters with a high share of dwellings in categories I and II, as well as with a high mean number of persons per one habitable room. These are also quarters with relatively high air pollution (particulates). In contrast, negative or low score values are proper to quarters with a higher share of permanently inhabited dwellings in family houses but also flats of category IV.

Fig. 7. Component II (2001)

Division of Bratislava's territory into two parts is most conspicuous in distribution of the component score values. The south-eastern part is, with the exception of some peripheral and outer zone quarters, characterized by positive and prevailingly high component score values. The quarters at a greater distance from the city centre with a high share of dwellings in family houses constitute an exception. The north-western part of the city includes quarters reaching low or very low component score values. In this case, several quarters in the west linked to the inner city zone and the quarters of the central and peripheral zone with prevailing housing estate coverage (Karlova Ves, Dúbravka, and Lamač) are exceptions.

The share of the third component in overall variance is more than 12 %. It can be interpreted mainly on the basis of variables concerning housing pool. As in the case of the preceding component, the characteristics of housing are complemented by variables of air quality and accessibility of the centre by public transport. High values of component score were assigned to quarters with a high share of dwellings built in 1970-1990; a higher mean number of persons per one habitable room and in the case of several quarters, also by longer times necessary to reach the city centre by public transport. Regarding the negative values of component loadings, the lower level of air pollution by benzene, or low to very low portion of dwellings built in the 1946-1970 period is characteristic of quarters with a high score. The contrary situation is that of quarters with negative or very low component score values.

In this case, too, the spatial distribution of component score values appears as a combination of concentric-zone and sector arrangement (Fig. 8). Quarters with the lowest values of score occupy the whole inner city zone and a part of the central zone in the northern, western and eastern directions; component score values, with few exceptions, increase with distance from the city centre in the above-mentioned directions. In the southern direction, the inner zone with low score values neighbours with the contrasting (in terms of observed values) transdanubian sector protruding into the central and peripheral parts of the city. It covers almost the whole built-up area of Petržalka while it is characterized by high component score values.

The fourth most important component accounts for 7.3 % of total variance. Absolute values of loadings higher than 0.5 are in this case linked with only two variables, which partially characterize the age structure of the housing pool and commerce in quarters. High component score values can be expected in quarters showing a high share of dwellings built in the period from 1946 to 1970, or low numbers of shops with fabrics and clothes per 1,000 inhabitants. In quarters with low values the contrary situation in the particular characteristics is logically expected.

The character of spatial distribution of component score values is sector-mosaic (Fig. 9). Quarters with high values create spatial clusters in the north-western (southern parts of the Little Carpathians) and north-eastern (environs of Račianska Street) parts of the central zone and in the eastern (large-housing estate of Ružinov) and south-eastern (Prístav, Vlčie hrdlo, Podunajské Biskupice) parts of the central and peripheral zones. More important sectors of quarters displaying low values of component score are found above all in the north-western

and north-eastern parts of outer and peripheral zones (Dúbravka, Lamač, Devín, Devínska Nová Ves, Záhorská Bystrica, Rača, and Vajnory) and within the inner city zone. Low score values also characterize the southern transdanubian sector of Petržalka.

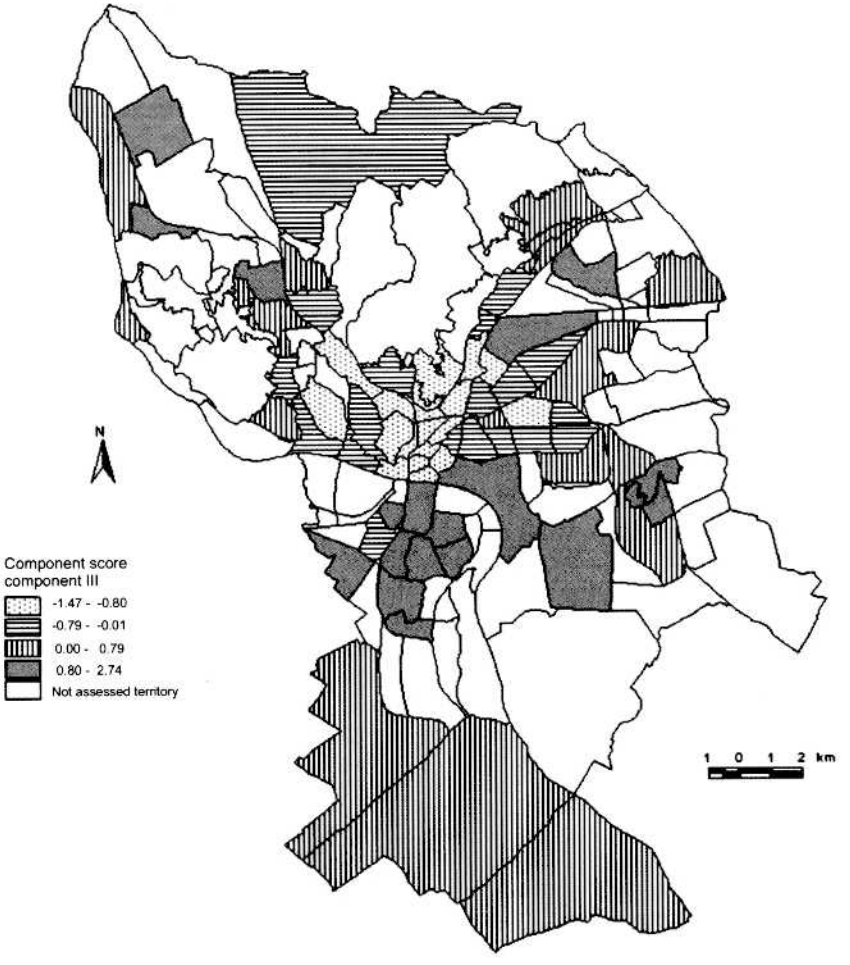

Fig. 8. Component III (2001)

Regional types

On the basis on the methods of multidimensional analysis or classification in the set of 75 quarters of Bratislava characterized by values of eight orthogonal components, 12 groups or regional spatial structure types were compiled. They were assessed for quality of living conditions. Their spatial distribution is shown in Fig. 10. Their interpretation was primarily based on mean component values computed for individual groups (Tab. 6). However, the fact that these

averages conceal some differences in the level of clusters that may manifest by a higher degree of intra-group variability also had to be taken into account.

Tab. 5. Components and component loads (2001)

Component and variables	Component load
Component I	
General practitioners for adults	0.904
Banks	0.867
Hairdresser's	0.826
Stomatologists	0.826
Pharmacies	0.813
Total greenery	0.778
Groceries	0.752
Catering facilities	0.722
Gynaecologists	0.690
Public greenery	0.643
Dwellings built before 1945	0.544
Dwellings of the category IV	0.521
Component II	
PM10	0.643
Dwellings of the category I and II	0.640
Occupancy of dwellings	0.549
City centre accessibility by public transport	-0.523
Area standard of dwellings	-0.596
Dwellings of the category IV	-0.638
Size of dwelling	-0.821
Dwellings in family houses	-0.891
Component III	
Dwellings built in 1971-1990	0.746
Occupancy of dwellings	0.652
City centre accessibility by public transport	0.624
Dwellings built in 1946-1970	-0.525
Benzene	-0.649
Area standard of dwellings	-0.680
Component IV	
Dwellings built in 1946-1970	0.549
Fabric and clothes shops	-0.546

Tab. 6. Mean component values for 12 regional types of city quarters

Type	Number of quarters		Components							
	Absolute	Relative (%)	1	2	3	4	5	6	7	8
A	12	16.0	0.16	-1.84	0.16	-0.31	-0.16	-0.27	0.10	-0.09
B	21	28.0	-0.70	0.39	0.90	-0.15	0.34	0.44	0.08	0.46
C	17	22.7	-0.28	0.59	-0.55	0.62	-0.80	-0.23	-0.25	-0.63
D	9	12.0	-0.03	-0.56	-0.89	0.36	-0.01	0.08	-0.02	1.01
E	8	10.7	0.41	0.69	-0.96	-0.37	1.25	-0.75	-0.20	-0.30
F	2	2.7	0.00	-0.29	2.17	-0.56	0.37	-0.61	-0.43	-2.44
G	1	1.3	1.84	-1.25	-1.30	1.89	2.06	4.48	-2.40	-0.86
H	1	1.3	1.46	1.01	1.54	2.96	-0.53	-2.61	0.90	1.02
I	1	1.3	6,65	0.91	2.74	1.63	-0.36	0.52	0.62	0.59
J	1	1.3	1.99	1.50	-0.49	-4.53	-4.74	1.60	-2.31	1.58
K	1	1.3	1.84	1.48	-1.11	-3.53	2.86	-1.27	0.68	-0.12
L	1	1.3	0.75	0.13	-1.46	-1.25	-1.42	1.75	6.43	-1.80

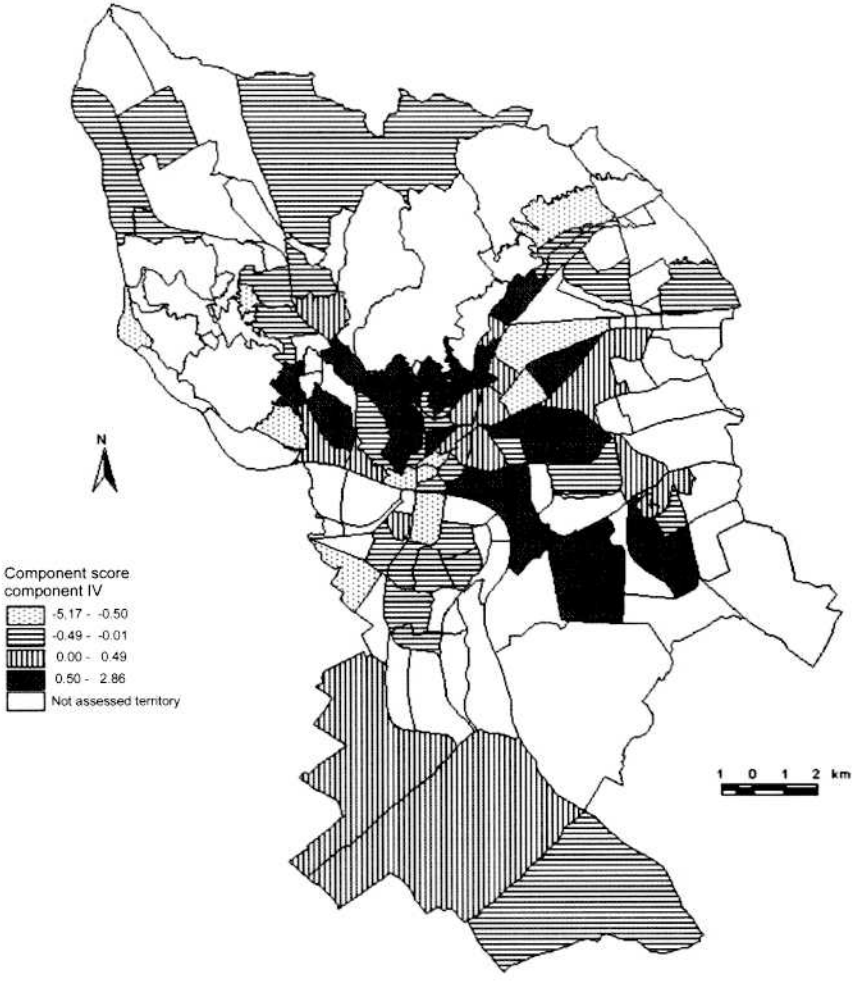

Fig. 9. Component IV (2001)

Twelve quarters situated in the peripheral and outer zones of the city form the A2 type. They are above all old cores of settlements, or former rural settlements joined to Bratislava, which still more or less conserve their rural character. A high proportion of permanently inhabited dwellings in family houses is evident there. As far as the environmental quality is concerned, the quarters enjoy relatively clean air due to low emissions of particulates. The higher portion of category IV dwellings and time-demanding accessibility of the city centre by public transport is negatively assessed. Amenities in these quarters are on a relatively low level.

Type B2 is the most abundant in terms of the number of quarters (21). It covers housing estates situated in the north-western, southern, and south-eastern

part of the central and peripheral zones. Component I values indicate problems of these extra densely populated quarters with a satisfactory level of amenities. The level of saturation by green areas or public greenery is also on a low level. Flats in blocks of houses prevail and the portion of dwellings in categories I and II is high in these quarters. Some quarters in the peripheral zone of the city suffer from unfavourable accessibility of the city centre by public transport. In several quarters of the B2 type a rather frequent incidence of vandalism and disorder has been observed.

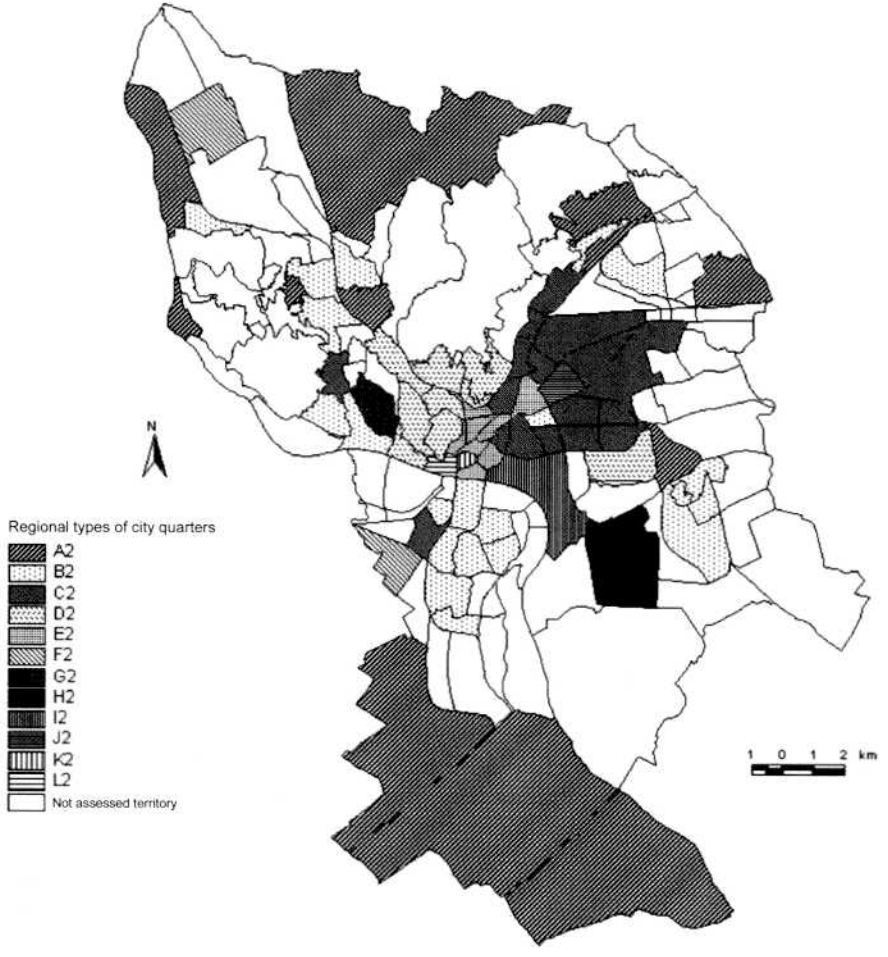

Fig. 10. Regional types of city quarters (2001)

Type C2 consists of 17 quarters situated prevailingly in the central zone and in the eastern part of the city. They are prevailingly residential sites built in the 1950s and 1960s. Below-average values of component 1 indicate the lower level of amenities accompanied by lower saturation by green areas. Compared

to the previous type B2 however, the situation is much favourable. The majority of quarters display increased concentration of dust particles in the air, lower residential comfort in terms of dwelling size but also a high incidence of dwellings in categories I and II. City centre accessibility is relatively good.

Quarters classified under D2 type (9) are concentrated above all on the south-eastern slopes of the Little Carpathians forming two compact units separated by the line of Pražská and Brnianska Streets. The exception is the quarter Prievoz with its situation in the eastern part of the city. Higher dwelling comfort has been observed in D2 type quarters (mostly dwellings in family houses). However, dwellings of category IV are also abundantly represented. The air in these quarters shows increased benzene and sulphur dioxide concentrations while the particulates concentration level is rather satisfactory. Time accessibility of the city centre or for instance kindergartens is relatively good.

Type E2 includes 8 quarters occupying almost the whole inner city zone and one quarter of the central zone. The adverse characteristics of this type are high pollutant concentration in the air and also a marked deficit in saturation by green areas. In terms of dwelling type, blocks of flats definitely prevail. The housing pool is comparatively old with a high incidence of dwellings built before 1945 or 1970. Consequently, the situation in amenities and city centre accessibility by public transport is favourable. Some quarters (Obchodná Street, Reduta) suffer from vandalism.

The F2 type comprises the quarters of Volkswagen and Kopčany. Values of selected components indicate a relatively favourable situation in terms of air pollution. Blocks of flats from the 1970s and 1980s prevail. Lower residential comfort is manifested in the higher proportion of dwellings in category IV. Amenities in quarters are on a low level while saturation with greenery is comparatively good.

As far as the G2 type is concerned, it is the first of the six identified regional types that can be referred to as a specific one. Type G2 contains one quarter Staré grunty, the position of which is indeed special. The larger part of the quarter is occupied by the university campus consisting of several residences and amenities serving the students. It boasts relatively good city centre accessibility by public transport. Problems with vandalism are comparatively frequent. Part of the quarter is also occupied by family houses constructed in the 1990s.

The quarter Vlčie hrdlo has been classified under type H2. Its specific nature is given by its situation in the direct neighbourhood of the Slovnaft refinery. This fact is manifested in the higher SO_2 concentration. Air quality is also impaired by a high concentration of particulates. Amenities in this quarter and saturation by greenery are on a relatively good level. Flats built from 1946 to 1970 prevail.

Type I2 is represented by the quarter of Prístav. The permanently resident population number as of the last Census in 2001 was very low but at present this is the most dynamically developing part of Bratislava, as the extensive building activity confirms. In 2006, the bridge Apollo over the Danube River was built which means an important change in transport infrastructure. The component values a indicate higher level of air pollution. Dwellings built before 1945 prevail in the housing pool. Saturation by greenery is good regarding the values of

relative indices. Accessibility of the city centre by public transport is well provided for the western part of the quarter.

Type J2 contains the quarter Pasienky. Its specific position is caused by low number of permanently resident inhabitants and the presence of the multifunctional shopping and leisure Polus City Centre. The quarter also boasts facilities for recreation and leisure of urban or regional significance. The quarter is comfortably accessible from the city centre by public transport. Increased air pollution seems to be the problem. Lower dwelling comfort in flats is related to fact that the greater part was built before 1945. There is a high concentration of retail shops with fabrics and clothes but also other types of commerce and services. Indicators of saturation by greenery reach a satisfactory level. In turn, the capacities of elementary schools are not sufficient.

Type K2 represents the quarter of the historical core. The quarter is part of the city centre, or the inner zone. Apart from historical monuments and cultural facilities especially selected types of retail shops (clothes), catering and leisure facilities are located here. The amenities of the quarter are on a high level. The environmental situation is aggravated by increased air pollution. Blocks of flats prevail and the proportion of those built before 1945 is high. The problem of the quarter is incidence of vandalism and disturbances.

The smallest quarter in terms of population is Podhradie, which constitutes the last identified regional type L2. It is situated in the inner zone in the area of the Castle hill particularly its eastern and southern foothills. In spite of some inconsiderate urban planning interferences in the past a number of historic monuments survived in this quarter. At present, it is an important territory in terms of further development of the city and construction of new residential capacities, shops and restaurants is planned for the near future. Dwellings built in the years between 1946 and 1970 and before 1945 are abundantly represented in the housing pool. Due to its position, the quarter enjoys a very good city centre accessibility.

COMPARISON OF STUDIES INVOLVED WITH THE QUALITY OF LIVING CONDITIONS IN BRATISLAVA

Comparison of the results of the two studies should be perceived in the context of differences in basic spatial units and sets of input variables. As far as the spatial units – quarters of the city are concerned – the internal division of the city was based on the network of city wards. The increase in the number of city quarters from 50 to 75 was mostly related to functional change in the use of some areas and construction of new residential units. In this respect, above all quarters like Petržalka, Vrakuňa, Ružinov, Rača, Karlova Ves and Devínska Nová Ves are worth mentioning. Likewise, some "original" quarters in the more recent study have been divided into a greater number of smaller quarters as a result of new constructions or other internal differentiation during the 20-year period. The number of variables was in turn lower in the recent study. This fact is connected with the issue of the considerable limitation of available data above all after 1990 (the period dealt with by Andráško 2007 in more details). Data based on general sets of measures, profiled survey of the loading produced by the communication network, the noise map or surveys of amenities and their facilities were not available for the recent study. Some variables that would de-

serve attention could not be included at all (for instance noise load). In other cases, in an effort to cover the theme it was necessary to apply construction of variables with naturally limited statement value. The typical example is that of indices of commercial amenities. On the other side, some variables connected for instance with the basic health care were not included in the older study at all. Even in spite of it, both sets of input variables manifest considerable similarity which is not surprising with regard to the multicriterion conditionality of the research. Variables defined in a similar or even identical way can be observed, for example, in the cases of the dwelling characteristics, some aspects of the environment or accessibility of the city centre.

The compared studies are similar in methodology or use of the multidimensional analysis and classification methods. This analogy too, is logically determined by the wide spectrum of the applied indices and orientation of research but also inspiration of the author of the recent study and that from the 1980s (Ira 1984), as well as the legitimate idea concerning the possibility of a meaningful comparison of the results. Thus, in both studies, principal component analysis represented the main tool for the reduction of the input variables or their transformation into a set of new independent variables (components) in the sense of a step sequence. These components represented the output in the form of an independent subject of further study on the one side and input for further, particularly cluster analysis on the other. Its aim was to create a regional typology for the territory of Bratislava from the point of view of the quality of living conditions. The use of the hierarchic agglomerative method of group distance averages in the newer study was not automatically determined by its use in the older study as such procedure might be considered methodologically incorrect in terms of the possibilities now offered by computer technology. However, the use of the given method appeared to be the most suitable from the wide spectrum of agglomerative procedures. Discrimination analysis has been used in both studies to verify the optimality and arrangement of the analysis applied to the original group of observations into individual clusters or regional types.

The comparison of the results is naturally considered most important. The differences concerning components extracted in the analysis of principal components are mostly connected with the already mentioned differences in the set of input variables. The basic quantitative difference, which represents the inevitable result of the methods we applied, is the extraction of 38 components in the first study and 28 components in the second study. This fact also partially reflects the share of the first four principal components in the overall variance, which reached 50.3 % in the study from the 1980s and 63.7 % in the study from the beginning of the millennium. In the case of saturation of the first four components involving variables with the absolute value of the component loading equal or higher than 0.5, there were several differences and the ensuing findings. Some of them should be briefly mentioned. Interpretation of components first of all points to the significance that some indices can have in the inner differentiation of the city space. The first extracted component in the study analysing Bratislava of the 1980s can be characterized mainly on the basis of variables that are absent in the analysis of the more recent period. This fact definitely confirms the seriousness of the absence of a wider spectrum of data. A similar conclusion matches the interpretation of the fourth most important component

in the older of the studies. Generally, their comparison reveals how important can be the availability of adequate data in the study of quality of life. As a result of the differences in the input set of variables in the older study, the most important principal components included some that could not even be considered for analysis in the recent study. Nevertheless, the rate of difference between the extracted principal components is far from being limited. The second principal component, for instance, proves this, because it is closely connected with the evaluation of the dwelling level in both studies. The parallel in the spatial arrangement of the component score values in this case suggests comparison of Figs. 2 and 7. The lower equality of the housing pool characterized by positive and negative component score values in the first and second study respectively was observed in quarters of the peripheral and outer zones with mainly family houses (Devín, Devínska Nová Ves, Rača, Vajnory, Vrakuňa, Jarovce, Rusovce, and Čunovo). The change of housing pool quality assessment for some quarters of the central zone (for instance in Petržalka) was caused by new constructions after 1980. The comparison of spatial differentiation in terms of the second component values, of course, cannot be interpreted in a definite way either. As a matter of fact, in the new study it was also saturated by the index of particulate emissions. The analogue variable (emissions of particulates over 350 t / km^2) in the work analysing the 1980s substantially participated in the characteristics of the first component value distribution. Thus, in the framework of the inner city zone and the neighbouring quarters of the central zone in the eastern and southern directions, its effect on the existence of positive (or high) first component score values is presumable in the case of the older study and those of the second component in the recent study (Figs. 1 and 7). In this way, it is possible to continue comparing individual components and score value distributions in the territory of the city and finding additional interesting similarities or differences.

Preparation and interpretation of the regional typology of Bratislava quarters based on the selected indices can be considered the final aim of both studies. With respect to the number of identified regional types (14 in the first study and 12 in the second study), no marked difference was found between the two studies. Differences in the group appurtenance of quarters again reflect the differences in clusters of input variables or component score values but also changes determined by the spatial development of Bratislava. In spite of this, a considerable level of spatial compactness and similarity of individual regional types can be observed in both cases. Type A covering the majority of settlement cores or former rural settlements annexed to Bratislava in the newer study is more differentiated in the older one. The coverage of the identical territory in this case has been accomplished under several regional types where the greatest representation corresponds to types E and G. Among the spatial units so classified it was obviously Janíkov dvor that has undergone the greatest change. In the 1980s, large housing estates were built in this quarter. However, this also happened in other localities, for example in Devínska Nová Ves or in Vrakuňa. It does not surprise then that in the newer of the two studies these territories of new quarters were classified into type B consisting above all of housing estates built in the 1970-1990 period. Compared with the older study, there is certain spatial analogy with the type C above all in the quarters of Dúbravka, Karlova Ves, Petržalka and Vrakuňa or Podunajské Biskupice. Similarity in appurtenance of

quarters to the regional types has also been observed in types A and D of the older study and less in other quarters and regional types.

The fact that half of all the identified groups were specific regional types consisting of only one quarter in both studies is considered fairly interesting. In the case of the older study, they were the inner city, Pálenisko, Vlčie hrdlo, Mlynská dolina, Jurajov dvor, old Petržalka, and Čunovo. Taking into account some tiny differences in spatial delimitation and names, the first four of these quarters were also delimited in the newer study as the specific regional types (historic core, Prístav, Vlčie hrdlo, and Staré grunty). The remaining two specific types were Pasienky and Podhradie. The information derived from delimitation of specific regional types in both studies points to the presence and need to take into account to some extent unique conditions in each studied territory. In some cases, the rate of this uniqueness or singularity is so marked that even when a certain degree of generalization is applied, it is not possible to classify the territories in question into bigger groups of spatial units.

CONCLUSION

The paper represents a practically unique comparison of two studies in the Slovak specialized literature involving the quality of the population's living conditions in a particular urban territory separated by a 20 year time span, but with almost the identical research methodology applied in both of them.

Results of the comparison have definitely pointed to the basic and limiting factor of similar studies, namely the scope of the available data. The absence of some variables or their replacement by indicators with ambiguous statement value can lead to deformation of the obtained results or even overall omission of some important pieces of knowledge. In this respect, Bratislava now represents an especially "problematic" territory, as the spectrum of regularly and adequately evaluated data has passed through a distinct reduction in the course of the last decade.

Comparison of results obtained from the two studies nevertheless suggest that not even differences in the sets of input variables and spatial units observed inevitably pose a compelling problem and identification of some similarities or changes of territory in the given time interval is possible. Both works also proved the existence of common features to quality of living conditions in given spatial units on the one side, but also pointed out that the rate of such similarity is limited. It ensues from a certain rate of uniqueness attributable to conditions of the particular spatial unit (locality) of the city at a certain time.

Identical methods of multidimensional analysis and classification have been used in both studies. Experience obtained from their application suggests that the multivariance statistical methods are sufficiently "robust" to be used even in spite of several "typical" geographical problems (such as suitability of the spatial observation units or data). As Johnston (1978) asserts, the given methods find their application in geographical research above all in the sense of certain "simplifying generalizations" required by the complexity of the world around us. Simultaneously, the same author points out that numbers cannot replace thinking. It is then obvious that the urban quality of life research based on application of the multivariance statistical method on the one side represents a suit-

able procedure for expression of the multifactor conditionality of the issue but on the other side, it also requires a highly sensitive approach depending on the personal experience and knowledge of the study territory possessed by the researcher.

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KVALITA ŽIVOTA V MESTSKOM PROSTREDÍ BRATISLAVY: DVE ČASOVO - PRIESTOROVÉ PERSPEKTÍVY

Cieľom predkladaného príspevku je zhodnotenie a porovnanie dvoch štúdií kvality života, resp. životných podmienok na území mesta Bratislava, ktoré vznikli s časovým odstupom 20 rokov. V oboch týchto štúdiách boli použité prakticky identické metódy viacrozmernej analýzy a klasifikácie.

Obe štúdie skúmali mesto Bratislava v rámci jeho administratívnych hraníc ku dňu sčítania v roku 1980, resp. 2001. Sledované územie bolo vnútorne členené na priestorové observačné jednotky – mestské štvrte. V staršej štúdii ich bolo 50, v novšej 75. Tento rozdiel môžeme považovať za dôsledok uplynulého 20-ročného obdobia, spájajúceho sa s výrazným priestorovým rozvojom mesta, zmenami funkčného využitia plôch, výstavbou nových obytných útvarov a výraznejšou vnútornou diferenciáciou niektorých „pôvodných" štvrtí.

Každá mestská štvrť bola charakterizovaná prostredníctvom hodnôt premenných, opisujúcich vybrané oblasti životných podmienok v meste. Pokles počtu premenných z 38, použitých v štúdii z 80. rokov (tab. 1), na 28 v štúdii z počiatku nového milénia (tab. 4) súvisel najmä s obmedzením rozsahu disponibilných dát v období po roku 1990. V niektorých prípadoch bolo pri novšom výskume potrebné využiť aj premenné s obmedzenou výpovednou hodnotou. Napriek tomu vykazujú oba súbory vstupných premenných i značnú podobnosť, napríklad v rámci charakterizácie úrovne bývania, životného prostredia či dostupnosti centra mesta.

U oboch štúdií bola na súbor vstupných premenných aplikovaná analýza hlavných komponentov, ktorej výsledkom bola extrakcia nových, navzájom nezávislých premenných – komponentov. Rozdiely v súboroch vstupných premenných sa logicky prejavili aj v rámci interpretácie prvých štyroch komponentov (tab. 2 a 5), pričom boli zaznamenané viaceré významné odlišnosti. Napriek tomu bolo možné zaznamenať aj viaceré podobnosti, a to napríklad v prípade druhého hlavného komponentu, ktorý v oboch prá-

cach pomerne úzko súvisel s hodnotením úrovne bývania. Priestorové rozloženie komponentného skóre vykazovalo v jednotlivých prípadoch tendenciu ku koncentrickozonálnemu, sektorovému, resp. sektorovo – mozaikovitému usporiadaniu (obr. 1-4 a 6-9).

Hodnoty komponentného skóre boli v ďalšom kroku použité v rámci zhlukovej analýzy, ktorej výsledky boli overené, resp. upravené prostredníctvom diskriminačnej analýzy. S ohľadom na počet identifikovaných zhlukov – 14, resp. 12 regionálnych typov, nebol medzi prácami zaznamenaný výraznejší rozdiel. V oboch prípadoch sa prejavila tendencia vytvárať typy reprezentované iba jednou priestorovou jednotkou, resp. typy so zastúpením malého počtu priestorových jednotiek, na druhej strane ale aj existencia typologicky väčších zhlukov štvrtí s podobnými charakteristikami životných podmienok (obr. 5 a 10). Práve u nich môžeme v prípade oboch prác pozorovať nielen značný stupeň priestorovej kompaktnosti, ale aj vzájomnej podobnosti. Taktiež štyri špecifické, iba jednou štvrťou tvorené regionálne typy boli v oboch štúdiách identifikované ako prakticky identické (I1 Pálenisko – I2 Prístav, J1 Vlčie hrdlo – H2 Vlčie hrdlo, H1 Vnútorné mesto – K2 Historické jadro, L1 Mlynská dolina – G2 Staré grunty).

Výsledky porovnania jednoznačne poukázali na základný limitujúci faktor takto zameraných prác, ktorým je rozsah disponibilných údajov. Absencia niektorých premenných, alebo ich nahradenie ukazovateľmi s nejednoznačnou výpovednou hodnotou, môže viesť k deformácii získaných výsledkov, či dokonca k celkovému opomenutiu niektorých, z hľadiska kvality životných podmienok veľmi dôležitých poznatkov. V tomto ohľade predstavuje mesto Bratislava v súčasnosti obzvlášť „problematické" územie, nakoľko spektrum pravidelne a v primeranom priestorovom rámci vyhodnocovaných dát prešlo najmä v poslednom desaťročí výraznou redukciou.

Komparácia poznatkov získaných v rámci oboch štúdií napriek tomu naznačila, že ani rozdiely v súboroch vstupných premenných a priestorových observačných jednotiek nemusia nutne predstavovať neprekonateľný problém a identifikácia niektorých podobností, alebo zmien územia v danom časovom období je možná. Obe práce taktiež svojimi výsledkami na jednej strane potvrdili existenciu spoločných čŕt kvality životných podmienok v daných priestorových jednotkách, na druhej strane ale tiež upozornili, že aj miera takejto podobnosti môže byť obmedzená. Vyplýva to najmä z určitej miery unikátnosti podmienok tej-ktorej priestorovej jednotky (lokality) mesta v určitom čase.

V rovine metodickej boli v oboch prácach použité rovnaké metódy viacrozmernej analýzy a klasifikácie. Skúsenosti získané pri ich využití naznačujú, že multivariačné štatistické metódy sú dostatočne „robustné" na to, aby napriek viacerým „typickým" geografickým problémom (napr. vhodnosť priestorových observačných jednotiek alebo dát) ich využitie (nielen) pri výskume intraurbánnych štruktúr bolo možné. Je teda zrejmé, že výskum urbánnej kvality života, založený na využití multivariačných štatistických metód na jednej strane, predstavuje vhodný postup pre zohľadnenie multifaktoriálnej podmienenosti problematiky kvality životných podmienok, na strane druhej si ale zároveň vyžaduje mimoriadne citlivý, na osobných skúsenostiach a poznaní sledovaného územia závislý prístup zo strany výskumníka.