# Neighbourhood (dis)satisfaction in a former closed Soviet city: the case of Dnipro(petrovsk), Ukraine

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**Abstract.** This paper describes and analyses the geography and factors of the neighbourhood satisfaction of the residents of a former post-WWII Soviet closed city in Ukraine – the post-Soviet city of Dnipro (population ca. one million). It is based on a questionnaire survey (n=1248) among adult (18+) inhabitants in Dnipro conducted in early 2018. The results show that the current inner-urban pattern is characterised by semi-peripheralised neighbourhood satisfaction, which is a consequence of the significant influence of (among other factors): infrastructure availability in the neighbourhood, the social and natural environmental in the neighbourhood, and the set of Soviet-legacy factors (the "Soviet" factor). Surprisingly, the highest level of neighbourhood satisfaction in the city of Dnipro is observed in one of the peripheral neighbourhoods (with predominant detached housing), in which the residents' evaluation of their residential neighbourhood follows the proximity effect.

## Contents:

## 1. Introduction

After the collapse of the communist system in Central and Eastern Europe and the former Soviet Union, the cities of these countries faced sharp problems of social injustice, social inequality, economic stagnation, etc. There is still a debate about the convergence or divergence of the post-communist urban transition trajectories in the former Eastern bloc countries (Tsenkova, 2006; Gentile et al., 2012; Ferenčuhová & Gentile, 2016; Golubchikov, 2016; Tuvikene, 2016; Mezentsev & Denysenko, 2018).

Since the 1990s, Ukraine, like any country of the former Soviet Union and post-communist countries of Europe, has undergone radical institutional, social and urban transformations (Sýkora & Bouzarovski, 2012; Gnatiuk & Kryvets, 2018; Mezentsev & Denysenko, 2018). Post-communist urban transformations in these states have radically changed the socio-spatial organisation of cities, and citizens' everyday-life practices and perceptions of intra-urban space and residential areas/neighbourhoods. These residential areas and neighbourhoods have undergone significant social and physical transformations in comparison with the communist era, as a result of de-industrialisation, commercialisation, privatisation, commodification, inner-city and outer-city suburbanisation and other typical processes that are inherent in the post-communist (incl. post-Soviet) urban transition. Hence, these processes of transition from a planned to a market economy have changed the different characteristics of the residential environment and, accordingly, residential satisfaction. Previous post-communist studies of residential satisfaction indicate that patterns of neighbourhood satisfaction and housing satisfaction differ significantly between cities and countries (Kovács & Herfert, 2012; Herfert et al., 2013) due to different experiences of "domestication of neo-liberalism" after the fall of the Iron Curtain and different durations of communist rule, which were reflected in various forms of communist legacy (Musil, 2005; Smith & Rochovská, 2007; Stenning et al., 2010; Van Assche & Salukvadze, 2012).

To date, the role of the Soviet legacy factor in shaping the current patterns of residential satisfaction in post-communist cities has been overlooked in research. In this study, the Soviet legacy means, on the one hand, the legacy of Soviet urban planning with its typical approaches to building self-sufficient large housing estates (microraions), which were supposed to have a good (to the extent possible under communism) basic urban and social infrastructure, i.e. all public services could be satisfied within walking distance. On the other hand, within the hierarchy of the Soviet state's urban settlements, there was a significant inequality of different types of resource redistribution, where closed cities occupied a special place due to their high-priority functions. Therefore, in the cities of this privileged category, there was a much better provision of food, culture, housing and infrastructure. After the geopolitical collapse of the Bolshevik Empire, the first two aspects lost almost all significance, in contrast to the "preservation" of the achievements of Soviet housing and infrastructure construction.

Thus, the Soviet urban planning legacy of the closed city is a poorly studied topic in previous research of residential satisfaction, especially as regards focusing on the former closed Soviet city, which would have a population of over 1 million (under communist rule). In particular, Soviet Dnipropetrovsk (more than 1 million people) was one of the largest "closed" cities in the USSR (Portnov & Portnova, 2015). Soviet Dnipropetrovsk had the status of "closed Soviet city" due to the presence there of high-priority military enterprises specialising in the serial production of rocket-building products – in particular, space launch vehicles for nuclear and thermonuclear weapons (see more Chertok, 2006; Portnov & Portnova, 2014; Siddiqi, 2016). This fact influenced the quality of the Soviet housing stock of the city and determined the better infrastructural provision among the residential neighbourhoods of the employees of these plants (Pivdenmash (Yuzhmash) and "Pivdenne" Engineering Design Bureau ["Yuzhnoye"] [see Note 1]). In fact, in the era of late socialism, about 60% of the population of Dnipro[petrovsk] were employees of Pivdenmash and the "Pivdenne" Engineering Design Bureau and members of their families (Zhuk, 2010: 21 cited in Portnov & Portnova, 2015).

Summing up, the main aim of this paper is to fill the gap created by the relative underrepresentation of former closed socialist cities in residential

studies and, simultaneously, to explore the role that a legacy of former high-priority status and Soviet urban planning has on current patterns of neighbourhood satisfaction – based on the evidence from Dnipro(petrovsk).

In general, the key research question can be formulated as follows:

Which socio-spatial patterns of neighbourhood (dis)satisfaction are present in post-Soviet Dnipro, and did Dnipro have similar/dissimilar trajectories of urban post-communist development to those of other cities of the former Eastern bloc, with a focus on neighbourhood satisfaction?

To answer these questions more comprehensively, the author broke them down into three more specific questions:

1. Which neighbourhood (dis)satisfaction patterns are present in post-Soviet Dnipro?
2. Which factors have the greatest impact on the neighbourhood (dis)satisfaction patterns in post-Soviet Dnipro?
3. What is the role of the set of Soviet legacy factors ("Soviet" factor) in the current neighbourhood (dis)satisfaction patterns in Dnipro?

Thus, the article goals are (a) to evaluate the integrated level of neighbourhood satisfaction in different residential neighbourhoods of Dnipro using the results of the 2018 survey, (b) to reveal current neighbourhood (dis)satisfaction patterns, and (c) to find out which factors influenced the existence of these intra-urban patterns.

The paper is structured as follows. The following section explores the conceptual framework of neighbourhood satisfaction within the general context of wider debates concerning the indicators and modelling approaches, and the research hypotheses are presented. After that, materials and research methods are described. The next section presents the empirical results of the study. The last section contains the corresponding conclusions and discussion.

## 2. Conceptual framework: neighbourhood satisfaction as a type of residential satisfaction

An important role in a human's life is played by residential environment, so the quality of the environment is a basic human need. In modern cities, the residential area or neighbourhood is the main environmental unit in which our social life takes place, and this necessarily affects the quality of life of residents (Hur and Morrow-Jones, 2008). Residential satisfaction is usually understood as people's degree of satisfaction with the living conditions in a certain residential neighbourhood (Terzano, 2014). Furthermore, residential satisfaction can be defined as "the degree to which people perceive their residential environment as able to meet their needs and further the attainment of their goals" (Yang, 2008: 309).

In short, residential satisfaction is understood as a measure of the degree to which an individual's actual and desired living conditions match. A high level of residential satisfaction usually indicates a high degree of congruence between one's actual and desired residential situations, while incongruence between the two may lead to feelings of dissatisfaction (Lu, 2012). In the literature, it is conventional to distinguish between satisfaction with housing or dwelling and with neighbourhood or surrounding area (Gentile, 2005; Lu, 2012; Herfert et al., 2013). But these two types of residential satisfaction are closely and intrinsically related. For example, an individual's assessment of housing conditions is likely to include its immediate surroundings (and even his or her relationships with neighbours). But they reflect different aspects of an individual's residential experience. The factors that shape housing and neighbourhood satisfaction overlap to some extent but are not identical (Lu, 2012).

The key issue in the concept of residential satisfaction is how to evaluate satisfaction at different spatial scales while also taking into consideration both subjective and objective indicators. This classic dilemma in the research of residential satisfaction has been aptly expressed thus:

*It is not easy to quantify residential satisfaction empirically. There are two different problems associated with this: on the one hand, social desirability generated by direct questions of the type 'To what extent are you satisfied with...?' and on the other, the difficulty of determining 'objective' levels of residential satisfaction. (Amérigo & Aragones, 1997: 54).*

To understand how to evaluate neighbourhood satisfaction, we should realise that it requires multifaceted indicators. Altogether, a lot of residential studies have identified important determinants of neighbourhood and housing satisfaction, such as socio-demographic and psycho-social (or behavioural) characteristics, housing and neighbourhood characteristics, and external characteristics (Amérigo & Aragones, 1997; Dekker et al., 2011; Herfert et al., 2013; Mohit & Raja, 2014; Krūmiņš et al., 2018). Neighbourhood satisfaction is one of the types of residential satisfaction that acts as a kind of marker of sociospatial development of the city, as satisfaction influences residents' mental health, intra-urban mobility, life satisfaction, urban regeneration, etc. (Gruber & Shelton, 1987; Grogan-Kaylor et al., 2006; Kweon et al., 2010; Permentier et al., 2011; Ferreira; 2016; Van Assche et al., 2019).

In the present study, based on the experience of numerous studies of neighbourhood satisfaction with both general and post-communist contexts (e.g., Basolo & Strong, 2002; Gentile, 2005; Adriaanse, 2007; Hur & Morrow-Jones, 2008; Herfert et al., 2013; Todorić & Ratkaj, 2015; Ferreira, 2016), subjective indicators are used to evaluate neighbourhood satisfaction, and external characteristics of residential neighbourhoods are used to search for the spatial patterns of neighbourhood satisfaction. On the one hand, the choice of this evaluation model of neighbourhood satisfaction is due to the fact that residents' subjective information about their neighbourhood provides an important insight into which aspects of the situation in the neighbourhood have a greater influence on overall neighbourhood satisfaction (Adriaanse, 2007). On the other hand, as pointed out above, it is empirically difficult to determine objective levels of residential satisfaction (Amérigo & Aragones, 1997: 54). The literature describes a lot of important indicators of neighbourhood satisfaction.

Basically, the degree of satisfaction with residential neighbourhood depends on indicators such as street lighting network, public transport and quality of service within a neighbourhood, etc. Importantly, subjective determinants of neighbourhood satisfaction can be divided into perception and evaluation of neighbourhood's individual attributes, because they have different subjective measures (Mantey, 2021). Therefore, hereinafter, subjective indicators will be understood as a subjective assessment of neighbourhood attributes, not as perception. Thus, the evaluation model of neighbourhood satisfaction in Dnipro consists of seven subjective indicators related to assessment of the quality of environmental, infrastructural (including public services), social aspects and landscaping, organisation of public services and amenities (see below), which are frequently used in pure or approximate form in various residential studies (see Amérigo & Aragones, 1997; Basolo & Strong, 2002; Furr et al., 2005; Tita et al., 2006; Hur & Morrow-Jones, 2008; Mantey, 2021).

On the one hand, studies of residential satisfaction in post-communist metropolises of Central and Eastern Europe and the former Soviet Union focus on the research of housing and neighbourhood satisfaction within the city, taking into account its intracity spatial structure (Gentile, 2005; Todorić & Ratkaj, 2015; Krūmiņš et al., 2018). As noted by Todorić & Ratkaj (2015), the neighbourhood satisfaction pattern in post-communist Belgrade (Serbia) has a number of central–peripheral differences. In particular, in the central zone of the city, the greatest dissatisfaction among residents is caused by air pollution, dirty streets, lack of parking space, illegal development, illegal growth of retail stores, the vast number of bakeries, banks, betting shops, etc. At the same time, in the outer zone of Belgrade, residents of neighbourhoods are dissatisfied with social and physical infrastructure (i.e., basic urban infrastructure), social environment and ecological situation (water, air and land pollution). Meanwhile, Gentile (2005) notes that, in a Former Soviet Union metropolis (Ust'-Kamenogorsk, Kazakhstan), residential satisfaction varies significantly by housing type rather than by neighbourhood distance from the city centre. Besides, this study recorded a significant influence of the USSR's legacy (Soviet

economic and territorial planning) on residential satisfaction in Ust'-Kamenogorsk – namely, there is a significant difference in satisfaction between the residents living in a housing stock built by former high-priority enterprises and the residents living in another, prevailing part of the housing stock. On the other hand, studies of residential satisfaction in post-communist metropolises relate to the scale of individual residential neighbourhoods of the city or even the city-regions (Bonnefoy et al., 2003; Kovács & Douglas, 2004; Temelová & Dvořáková, 2012; Herfert et al., 2013; Temelová & Slezáková, 2014; Neugebauer & Kovács, 2015; Gorczyca & Grabinski, 2018). For example, Herfert et al. (2013) examined the neighbourhood satisfaction in five CEE city-regions (Leipzig, Budapest, Vilnius, Sofia and St Petersburg) and concluded that large housing estates built in the 1970s and 1980s have a high level of satisfaction among their residents. However, as the authors themselves note, the better quality of greenery and the design of new residential areas in the inner-city neighbourhoods and the refurbishment of the old city make large housing estates less attractive and decrease the satisfaction of their residents (especially in the cases of Leipzig, Budapest and Vilnius).

As the above empirical studies show, unlike other countries of the former USSR and post-communist countries of Central and Eastern Europe, we know very little about the current patterns of neighbourhood satisfaction (incl. neighbourhoods with Soviet large housing estates) in Ukrainian metropolises. Factors influencing the neighbourhood satisfaction in the Ukrainian metropolises are not deeply researched and are not obvious. This research focuses on the city of Dnipro, Ukraine, as one of the largest metropolises of the former Soviet Union and one of the typical post-communist cities of Central and Eastern Europe with its inherent range of social, economic, spatial and local government problems related to post-communist urban transition. Moreover, during the Soviet era, Dnipro was a privileged, "closed" city due to its important military-industrial functions (production of rocket engines), which significantly distinguished Dnipro from other cities in the Soviet Union (Chertok, 2006; Zhuk, 2010 cited in Portnov & Portnova, 2015; Portnov & Portnova, 2015; Siddiqi, 2016). Therefore, it is expected that the role of the "Soviet" factor, as a combination of the Soviet legacy factors, can play one of the dominant roles in the neighbourhood assessment and the neighbourhood satisfaction. Additionally, it is hypothesised that relatively high neighbourhood satisfaction in Dnipro is observed among residents of neighbourhoods with large Soviet housing estates (which inherited their residential attractiveness and
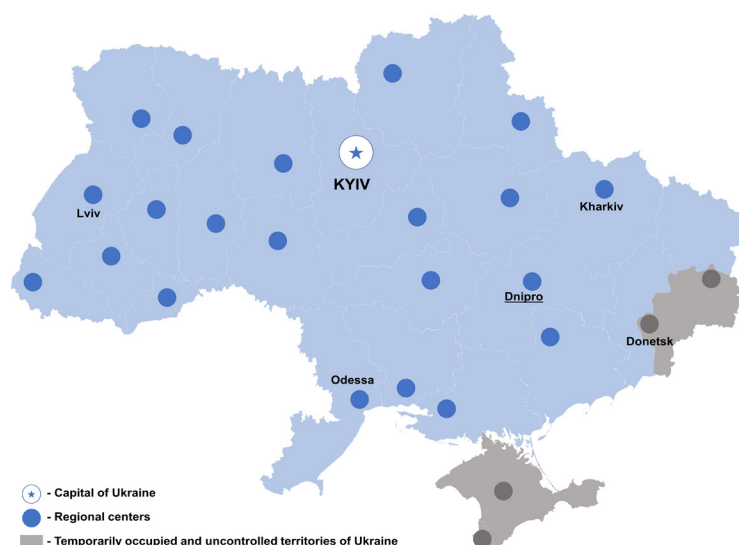


**Fig. 1.** Map of Ukraine showing six major cities, regional centres and location of case study site (as of February 23, 2022)
Source: author's elaboration

**Fig. 2.** Post-Soviet urban landscapes in Dnipro: (a) manhattanization of central Dnipro, (b) historical part of Dnipro ("Old Dnipro") – city core with mixed housing; (c) Soviet mass housing (large housing estate "Topol-1") with fragments of individual insulation of the facade – semi-periphery of Dnipro with mostly multi-storey housing; (d) "urban village" and (e) rural–urban contrast – semi-periphery of Dnipro with mostly detached housing; (f) panorama of the periphery of Dnipro with mostly detached housing
Source: Photos by author, May 2019

prestige from the Soviet era); this is contrary to Musterd and Van Kempen's (2007) assertion that many dissatisfied residents live in Eastern European post-WWII large housing estates.

## 3. Materials and methods

### 3.1. Characteristics of the study area

Dnipro, with a population of ca. 1 million people, was chosen as a research case (Fig. 1) as one of the six key core cities of interregional urban settlement systems in Ukraine (Mezentsev, 2005; Rudenko & Savchuk, 2013). The modern spatial structure of Dnipro (Dnipropetrovsk until 2016) consists of three historical layers, such as pre-Soviet, Soviet and post-Soviet, or in a broader historical sense, pre-communist, communist and post-communist (Fig. 2). These three phases of the city's historical development are also typical for other cities in Central and Eastern Europe and the former USSR (e.g., Gentile, 2005; Herfert et al., 2013; Todorić & Ratkaj, 2015; Krūmiņš et al., 2018). Since the 19th

century, Dnipro has always been an important centre of socio-economic development of Ukraine, and in the second half of the 20th century the city became one of the few centres of space defense industry in the world and the largest of eleven "closed" cities of the former Soviet Ukraine (Portnov & Portnova, 2015).

Nowadays, Dnipro has many features of a typical post-communist metropolis in terms of planning structure, types of housing, socio-spatial transformations (e.g., manhattanisation, gentrification, etc.) and institutional transformations, etc. (Fig. 2). Simultaneously it retains a significant influence of the industrial "past" of the times of the former "Soviet empire".

### 3.2. Survey materials

This study is based on a sample questionnaire survey among adults (18+) inhabitants in Dnipro (n=1248) conducted in early 2018 – see Note 2. The survey was initiated by University of Oslo (Norway) and conducted on a contractual basis by the "Centre for Social Indicators" (CSI) which is affiliated with

**Table 1**. Subjective indicators of neighbourhood satisfaction

| Indicators | Scale |
|---|---|
| 1. Air quality | 1–5, where 1 is very bad, 5 is exellent |
| 2. Choice of shops, supermarkets | 1–5, where 1 is very bad, 5 is exellent |
| 3. Landscaping, organisation of public services and amenities | 1–5, where 1 is very bad, 5 is exellent |
| 4. Public transport | 1–5, where 1 is very bad, 5 is exellent |
| 5. Criminogenic situation | 1–5, where 1 is very bad, 5 is exellent |
| 6. Choice of entertainment places of different types | 1–5, where 1 is very bad, 5 is exellent |
| 7. General social situation | 1–5, where 1 is very bad, 5 is exellent |

Source: Dnipro survey, 2018



**Fig. 3.** Network of residential neighbourhoods in Dnipro and neighbourhood classification
Source: by author

the authoritative Kyiv International Institute of Sociology (KIIS). It was face-to-face survey that among other questions included the following question on neighbourhood satisfaction: "How do you evaluate your neighbourhood in terms of such indicators on a scale of 1 to 5 (1 – very bad, 5 – excellent)?" (see indicators in Table 1).

Dnipro's survey was conducted on the basis of a random sample of 125 voting precincts (or at the highest spatial level within 64 electoral constituencies). Subsequently, 33 residential neighbourhoods were formed out of 64 constituencies. This was done to ensure an approximate representative sample for the city in terms of type of housing, geographical location relative to the city centre and exposition in relation to the Dnipro River (Fig. 3), as there is no official network of residential neighbourhoods in

Dnipro (even in the current *Master Plan of Urban Development in Dnipro,* 2019). At the stage of data coding and analysis, respondents were provided with complete anonymity, and, appropriately, the dataset does not include names or addresses, being in accordance with relevant Ukrainian and Norwegian personal data protection legislation.

### 3.3. Research methods

In the present study, to answer the above research questions and hypotheses, an evaluation model of neighbourhood satisfaction was built, and, based on it, an aggregate index of neighbourhood satisfaction was calculated and two types of statistical analysis were performed.

Based on the survey data, an evaluation model of neighbourhood satisfaction was built that consists of seven different subjective parameters (indicators) of neighbourhood satisfaction such as air quality, criminogenic situation, public transport, etc. (see Table 1). Aspects included in this model are often found in other previous residential studies (e.g., Amérigo & Aragones, 1997; Basolo & Strong, 2002; Furr et al., 2005; Tita et al., 2006; Hur & Morrow-Jones, 2008; Hanák et al., 2015; Feldmane, 2019). The article evaluated the neighbourhood satisfaction based on the results of subjective evaluations of 1248 respondents living in Dnipro (Appendix 1). The algorithm for calculating neighbourhood satisfaction index is represented by the following formula:

$$Neighborhood\ Satisfaction\ Index_k = \frac{1}{N}\sum_{\substack{j=1\\k=1}}^{N=1} z_{jk}$$

where:

$Neighbourhood\ Satisfaction\ Index_k$ – the integrated average evaluation of neighbourhood satisfaction in the kth residential neighbourhood;
$N$ – the number of indicators of neighbourhood satisfaction;
$Z_{jk}$ – the average value (geometric mean) of the $j^{th}$ indicator of neighbourhood satisfaction in the $k^{th}$ residential neighbourhood of the city; we calculated the average scores on seven indicators of neighbourhood satisfaction for 33 residential neighbourhoods as follows:

$$Z_{jk} = \sqrt[n]{\prod_{\substack{i=1\\j=1\\k=1}}^{n=1} x_{ijk}}$$

$x_{ijk}$ – the answer of the $i^{th}$ respondent on the $j^{th}$ aspect (indicator) of neighbourhood satisfaction in the $k^{th}$ residential neighbourhood of the city;
$n$ – the number of respondents who answered the question on the $j^{th}$ aspect of neighbourhood satisfaction in the $k^{th}$ residential neighbourhood of the city.

The results of building the evaluation model of neighbourhood satisfaction and calculating neighbourhood satisfaction index helped to evaluate the integrated level of neighbourhood satisfaction in different residential neighbourhoods in Dnipro, using the survey results (see Section "Introduction"), and further processing of these results *via* two types

of statistical analyses will provide answers to other research questions.

The first of the two types of statistical analyses performed was the well-known factor analysis that is widely used in the literature on this topic (e.g., Ha & Weber, 1994; Fernández et al., 2003; Adriaanse, 2007; Amole, 2009; Gan et al., 2019). In this case, factor analysis was performed in the form of Principal Components Analysis (PCA) with varimax rotation in Statistica software. Factor analysis identified which of the key factors from the system of neighbourhood satisfaction indicators (see Table 1) have the greatest influence on the overall evaluation of neighbourhood satisfaction. Moreover, the calculation of factor scores made it possible to analyse the influence of identified factors on the formation of neighbourhood satisfaction within each of the 33 urban neighbourhoods.

The second type of statistical analysis performed in this study was descriptive statistics. Different elements of descriptive statistics were used to find answers to the research questions outlined at the beginning of the paper. The appeal to the methods of descriptive statistics, in particular the use of box plots, was intended to show the differentiation of respondents' evaluation depending on the geographical location and type of housing of their neighbourhoods. It is expected that the box plots of aggregate evaluation of respondents on different aspects of satisfaction with the area of residence, depending on the above characteristics, will help to identify and, as far as possible, explain the spatial patterns of neighbourhood satisfaction in Dnipro.

## 4. Results

### 4.1. Neighbourhood satisfaction in the post-Soviet metropolis: key empirical factors

The results of the factor analysis of seven neighbourhood satisfaction indicators in Dnipro (Table 2) produced two factors and explained 85% of the variance. Using the obtained factor loadings, both the two factors found were interpreted, and the strength of influence of each of them on the overall neighbourhood satisfaction in Dnipro was determined.

**Table 2**. Factor analysis results

| No. of neighbourhoods = 33 | FACTOR ANALYSIS I. Determining number of factors (according to Kaiser criterion) Extraction: principal components | | | | |
|---|---|---|---|---|---|
| | Value | Eigenvalue | % Total variance | Cumulative Eigenvalue | Cumulative % |
| | 1 | 4.874485 | 69.63550 | 4.874485 | 69.6355 |
| | 2 | 1.073952 | 15.34217 | 5.948437 | 84.9777 |
| | 3 | 0.353485 | 5.04978 | 6.301922 | 90.0275 |
| | 4 | 0.334809 | 4.78299 | 6.636731 | 94.8104 |
| | 5 | 0.164798 | 2.35426 | 6.801529 | 97.1647 |
| | 6 | 0.105483 | 1.50690 | 6.907012 | 98.6716 |
| | 7 | 0.092988 | 1.32840 | 7.000000 | 100.0000 |

II. Rotation procedure and interpretation of factors

N. of neighbourhoods = 33        Factor loadings (Varimax raw); Extraction: principal components
(Marked loadings are > 0.640000)

| Variable | Factor 1 | Factor 2 |
|---|---|---|
| Air quality | 0.050128 | **0.945661** |
| Choice of shops, supermarkets | **0.649137** | 0.617093 |
| Landscaping, organisation of public services and amenities | **0.821706** | 0.484436 |
| Public transport | **0.902025** | 0.031728 |
| Criminogenic situation | 0.423291 | **0.772556** |
| Choice of entertainment places of different types | **0.863649** | 0.331012 |
| General social situation | 0.515269 | **0.792436** |
| Expl.Var | 3.103308 | 2.845129 |
| Prp.Totl | 0.443330 | 0.406447 |

Source: Dnipro survey, 2018; author's calculations

Table 2 presents the factor loadings on a set of variables, which makes the interpretation of factors very simple. Factor 1 can be interpreted as the general opinion of Dnipro residents about satisfaction with (1) the choice of shops, supermarkets, (2) landscaping, organisation of public services and amenities, (3) public transport, and (4) the choice of entertainment places of different types in their residential neighbourhoods. It reflects their experience of local urban practices and assessments of the physical accessibility of urban infrastructure and its accordance with the needs of their everyday activities within the city's neighbourhoods. Therefore, this factor is labelled the "infrastructure availability factor" (or "service-infrastructural factor", symbolic label "F1"). Factor 2 is labelled the "environmental (social and natural) factor" (or "socio-ecological factor", symbolic label "F2"). This factor reflects the respondents' evaluations of their satisfaction with (1) air quality, (2) criminogenic situation, and (3) the general social situation in their residential neighbourhoods. Based on the percentages of factors in the total variance in Table 2, it was found that the infrastructure availability factor (44.3%) more strongly influences the general neighbourhood satisfaction pattern in Dnipro than the environmental factor (40.6%).
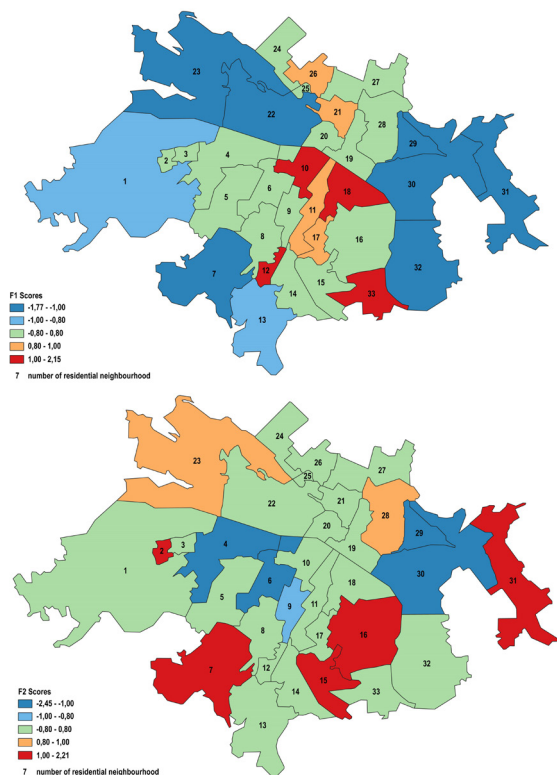
Despite the relatively strong influence of the above factors on neighbourhood satisfaction among the residents of the metropolis, the significance of the influence of these factors on each of 33 neighbourhoods still varies. The results of

visualisation of factor scores of both infrastructure availability and environmental factor (Fig. 4) illustrate the unevenness of significant influence of factors on intra-urban patterns of neighbourhood satisfaction. Furthermore, in Dnipro, there is no overlapping of significant influences (factor scores of 1.00 or more) of both factors in one residential neighbourhood, which indicates the heterogeneity of the influence of factors on residents' satisfaction with their neighbourhoods.

Analysis of the differentiation of factor scores of both factors at the level of residential neighbourhoods showed a significant influence of infrastructure availability factor on satisfaction with the neighbourhoods in the inner city, while a significant influence of environmental factor is observed in some semi-peripheral neighbourhoods with Soviet housing estates (factor scores are more than 1 but less than 1.02) and very distant peripheral neighbourhoods with mostly detached housing (factor scores are more than 1.59). Generally



**Fig. 4.** Influence of infrastructure availability factor (F1) on neighbourhood satisfaction in Dnipro (top map); Influence of environmental factor (F2) on neighbourhood satisfaction in Dnipro (bottom map)
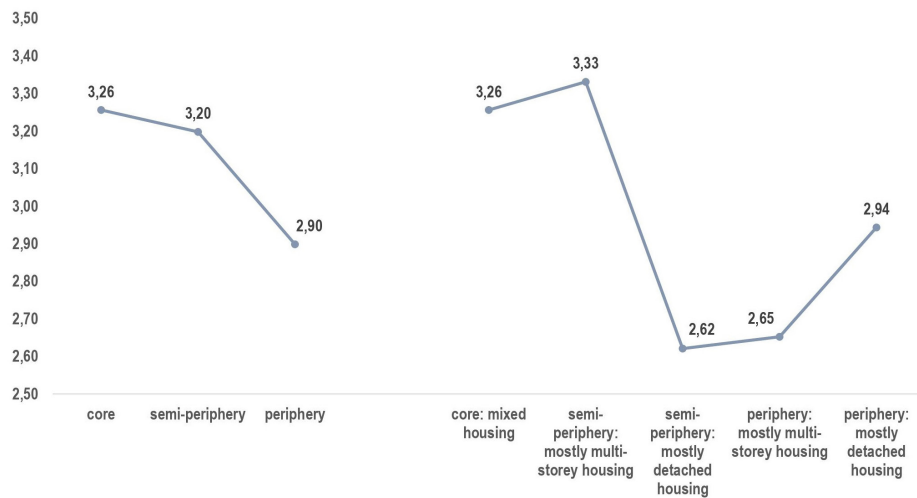Source: author's elaboration

speaking, the influence of the infrastructure availability factor on the general neighbourhood satisfaction in Dnipro is characterised by a centripetal gradient, and, *vice versa*, the influence of environmental factor has a visible centrifugal gradient. This could be explained by the fact that the service and infrastructure of the inner-city neighbourhoods have higher quality than other neighbourhoods. At the same time, socio-ecological problems in the former are not as alarming as those in the latter. Therefore, the environmental factor is more important for the formation of synthetic neighbourhood satisfaction on the periphery, whereas this factor is of secondary importance in the inner city.

Consequently, infrastructure availability and environmental factors have almost the same influence on the formation of neighbourhood satisfaction pattern, but with essential differences at the intra-urban level. The unevenness and heterogeneity of the influence of each of the factors on residents' overall satisfaction with their neighbourhoods are explained by (a) differences between the neighbourhoods in terms of the provision of infrastructure and services, most of which were laid down in the Soviet era; (b) the proximity or remoteness of residential neighbourhoods to sources of air pollution such as industrial zones and major city roads with periodic traffic congestion; and (c) the general social situation and the level of crime in urban neighbourhoods.

### 4.2. Neighbourhood satisfaction in the post-Soviet metropolis: intra-urban patterns

The results of a study of intracity and zonal differentiation of neighbourhood (dis)satisfaction in Dnipro (Fig. 5, Fig. 6) indicate that neighbourhood satisfaction in this former Soviet metropolis depends both on the localisation of the neighbourhood relative to the city centre and on the housing type. At the generalised level, Dnipro has a central–peripheral pattern of neighbourhood satisfaction, which was not an unexpected result given that a central–peripheral gradient of neighbourhood satisfaction has been recorded in some other empirical studies of post-communist cities (e.g., Gentile, 2005; Todorić & Ratkaj, 2015).
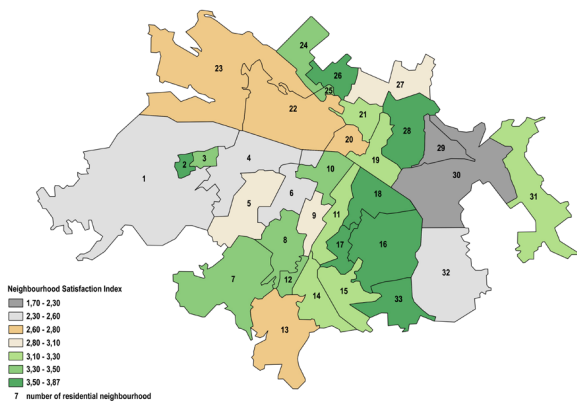
**Fig. 5.** Differentiation of Neighbourhood Satisfaction Index, Dnipro, Ukraine
Source: author's elaboration

especially in terms of their mobility to work in the central business district (CBD) or other neighbourhoods of the city. Thus, a disproportion in the quality of infrastructure and housing built among the neighbourhoods of Dnipro was established during the communist rule, which is one of the confirmations of the impact of the Soviet urban legacy.

However, the general centre–periphery pattern of neighbourhood satisfaction is not so unambiguous (Fig. 6, Fig. 7). The results of descriptive statistics of the integral index and other indicators of neighbourhood satisfaction among 33



**Fig. 6.** Differentiation of average Neighbourhood Satisfaction Index by city zones, Dnipro, Ukraine
Source: Dnipro survey, 2018; author's calculations

Most residents of the central and semi-peripheral neighbourhoods of the city are quite satisfied with the neighbourhoods, while in the peripheral neighbourhoods the majority of residents are dissatisfied. Such a generalised pattern of neighbourhood satisfaction in Dnipro is due to the fact that, during the Soviet era, urban planning of large Soviet cities was extensive and created vast peripheral urban–rural spaces (i.e., urban village spaces) within the cities, but did not provide the necessary basic urban infrastructure and adequate/normal transport links between these spaces and other neighbourhoods of the city. As a result, most peripheral neighbourhoods in Dnipro are experiencing transport hunger, which limits the daily activity of these neighbourhoods' residents,

neighbourhoods (Fig. 7) indicate that a high level of neighbourhood satisfaction in Dnipro is recorded in semi-peripheral neighbourhoods with multi-storey housing, but not in the central neighbourhoods. Eleven of these 13 semi-peripheral neighbourhoods have a higher-than-citywide level of neighbourhood satisfaction (aggregate mean score of 3.09), and ten of them have a level of satisfaction higher than in the city centre as a whole (Fig. 5, Fig. 6, Fig. 7).

Firstly, this phenomenon of semi-peripheralisation of neighbourhood satisfaction within the post-Soviet Dnipro is explained by the fact that the semi-peripheral neighbourhoods, which are mainly multi-storey housing (Brezhnevki, Khrushchevki and patches of new buildings), are far from the noisy, densely built-up, highly commercialised
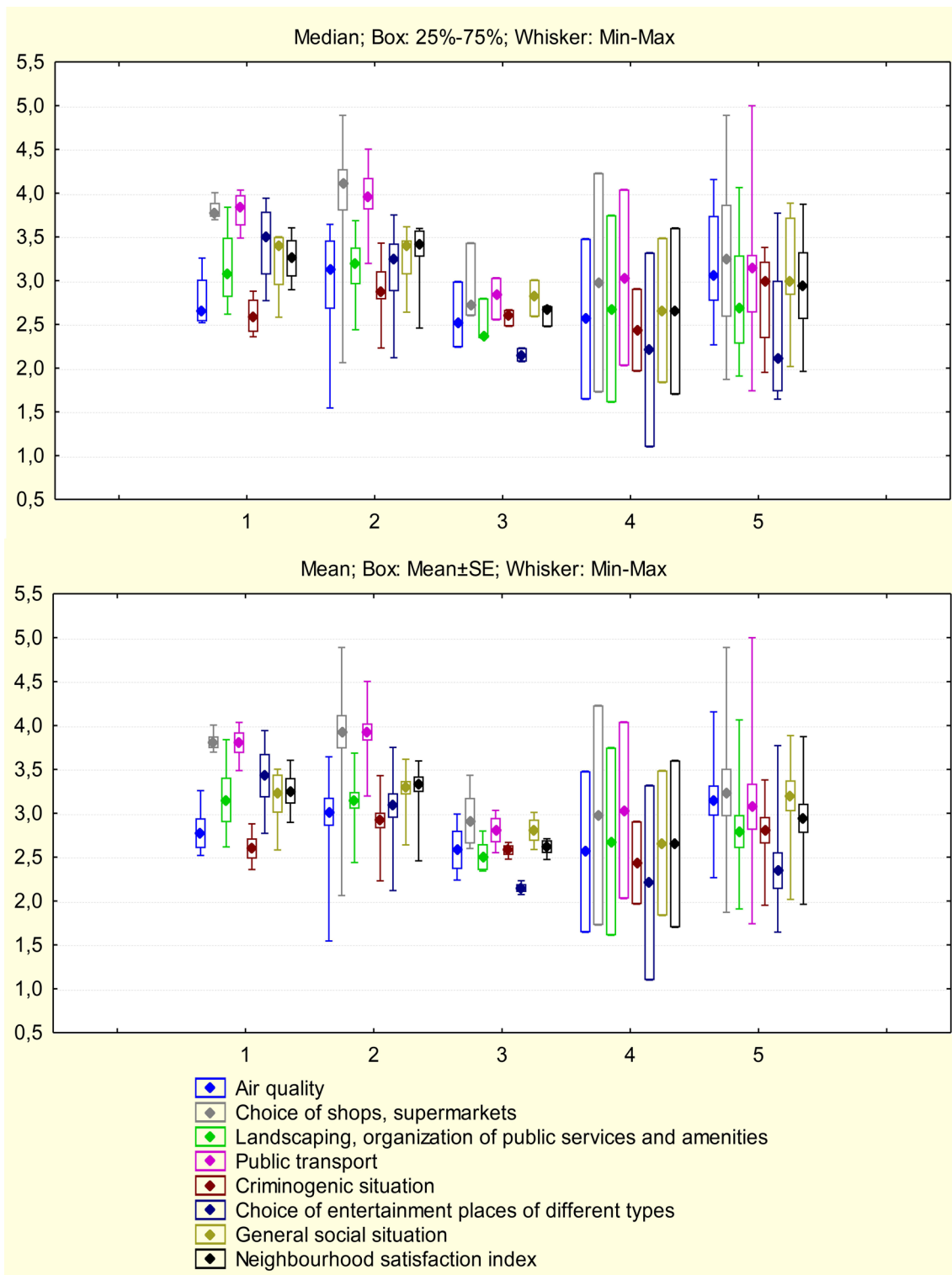
**Fig. 7.** Box plots of indicators of neighbourhood satisfaction and Neighbourhood Satisfaction Index depending on housing type and location of neighbourhood on basis of centre–periphery: (1) core with mixed housing (4 of 33 neighbourhoods); (2) semi-periphery with mostly multi-storey housing (13 of 33 neighbourhoods); (3) semi-periphery with mostly detached housing (3 of 33 neighbourhoods); (4) periphery with mostly multi-storey housing (2 of 33 neighbourhoods); (5) periphery with mostly detached housing (11 of 33 neighbourhoods)

Source: Dnipro survey, 2018; author's calculations

and car-polluted centre and somewhat stagnant inner-city neighbourhoods, but simultaneously have a good level of infrastructure provision and excellent transport links with the centre; this is not the case in most peripheral neighbourhoods. In addition, in some peripheral neighbourhoods, there is a deplorable ecological situation, due to the proximity of these neighbourhoods to the industrial zones of the city.

Secondly, during the post-communist urban transition, residential functions in most post-communist cities were displaced from the city centre as a result of commercialisation and the "neoliberal commodification of everything". In particular, Sýkora (2015) notes that during the communist era, the centres of ex-communist cities had residential functions, as there was no such commercialisation as in capitalist cities. Thus, the tempestuous post-Soviet commercialisation of the Dnipro city centre moved the residential function further from the city centre to the semi-peripheral neighbourhoods. In general, in post-Soviet Dnipro there is currently a predominance of investment flows towards the centre, inner city, and semi-
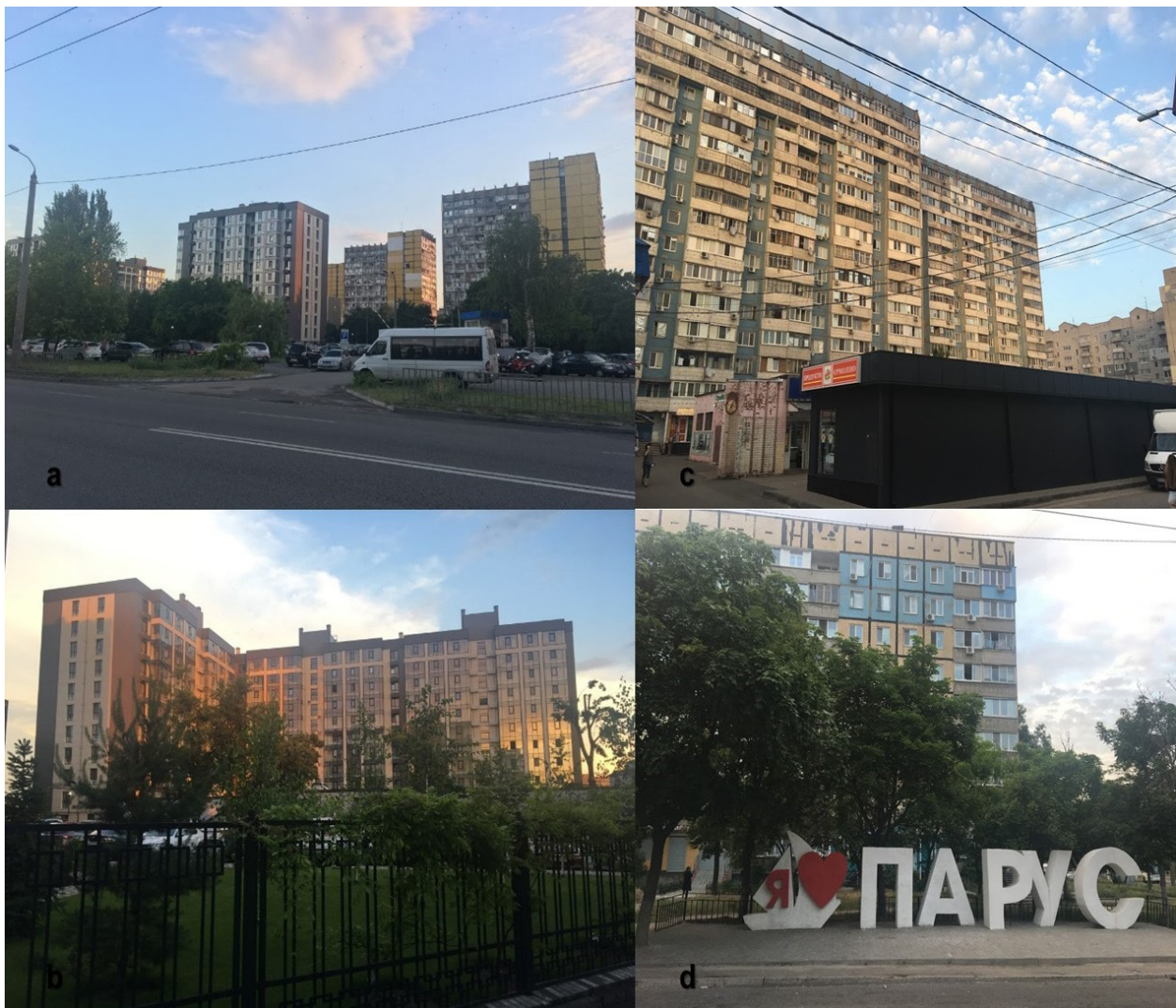


**Fig. 8.** An example of Soviet-era prestigious large housing estates (LHE) in Dnipro: (a) and (b) – urban regeneration in the Soviet large housing estate "Peremoha": Reconstruction of the Soviet-type unfinished houses and their transformation into a gated community for the influx of new members of the middle professional class and increased prestige of the microdistrict; (c) and (d) – the late-Soviet large housing estate "Parus" with high level of neighbourhood satisfaction among residents. LHE-Parus is an example of inherited Soviet prestigious status
Source: photos by author, May 2019

periphery with Soviet housing estates that have a good reputation and prestige. This generates urban regeneration in these areas and mainly fits (though with certain features of Soviet mass-housing estates) in the model of investment flows within a post-communist city described by Sýkora (2009: 388–389). He emphasises that, in post-communist cities, investment flows are concentrated mainly in the centre, inner city and suburbs, as opposed to the pattern of investment flows in communist cities, where investment is focused on building and improving housing estates and in the city centre as an indicator of the achievements of building socialism. In Dnipro, as in other cities of the former Eastern bloc (for example, Van Assche and Salukvadze, 2012; Bugarič, 2018), recent post-communist urban transformation processes in the centre and near-centre neighbourhoods have suffered a disastrous impact of "investor urbanism". This is characterised by the almost complete absence of any local resident influence on urban development (incl. neighbourhood development).

Thirdly, the former status of the closed city, which was perceived as privileged during the Soviet era, affected the quality of urban planning and the construction of "new" Soviet housing estates in the postwar period, which in turn formed prestigious neighbourhoods in Dnipro. Empirical results show that these prestigious neighbourhoods still enjoy a high level of neighbourhood satisfaction (Fig. 8). This preservation of the prestige of Soviet housing estates since the era of late socialism and a fairly high level of satisfaction of their residents can be interpreted as the impact of Soviet housing legacy on the current pattern of neighbourhood satisfaction in Dnipro.

And finally, in most Soviet housing estates of Dnipro, there is still a social mix that was established during the Soviet era, which is also typical for housing estates in other post-communist cities (e.g., Herfert et al., 2013; Neugebauer & Kovács, 2015; Gorczyca, 2016; Szafrańska, 2018; Galuszka, 2020). Perhaps, such social stability within residential neighbourhoods can be interpreted as the influence of the Soviet legacy, although since the 2000s there has been a certain maintaining of the heterogeneous social structure of these neighbourhoods with some change by occupation due to highly skilled professionals settling or continuing to live alongside the working class. Frequently, these highly skilled professionals come from the working class of these neighbourhoods, but they do not consider the possibility of moving to other neighbourhoods, due to their established social ties and rootedness in their neighbourhoods.

As for intra-urban mobility in Dnipro, it is quite low due to high rents for residential real estate within the historic centre and inner-city neighbourhoods and high prices for new-build housing in other parts of the city (sometimes quite questionable quality of building construction and materials); it is probably for these reasons that highly skilled professionals choose to live in residential neighbourhoods with Soviet housing estates from late socialism that have good infrastructure, relative proximity to the CBD and a good reputation for the general social situation. Due to this model of residential behavior within the framework of intra-city mobility, residential neighbourhoods with Soviet housing estates, which are mainly concentrated in the semi-periphery of the city, remain attractive to Dnipro residents and, accordingly, have a sufficiently high level of neighbourhood satisfaction. This significantly fragments and slows the gentrification process (the city has weak nodes of gentrification) and generates the process of residential semi-peripheralisation as a result of the semi-peripheralisation of neighbourhood satisfaction.

Despite the semi-peripheralisation of neighbourhood satisfaction in Dnipro, a relatively high level of neighbourhood satisfaction is observed among several peripheral neighbourhoods with mostly detached housing (see neighbourhoods 7, 15, 24 and 33 in Fig. 5), which is a consequence of the Soviet era with the experience of including the suburbs within the city limits after the territorial-administrative expansion, and post-Soviet suburbanisation. However, among these neighbourhoods there is the "Lots-Kamyanka/Kamyanka" neighbourhood (within neighbourhood 33 in Fig. 5), which has the highest satisfaction of residents. This neighbourhood has a mixed social structure (rich and poor live side by side) and a very strong influence of the infrastructural accessibility factor on the overall assessment of satisfaction. However, in practice, this neighbourhood cannot compete with the service-infrastructure provision of the most prestigious Soviet large housing

estates in Dnipro (for example, "Peremoha" within neighbourhood №16 and "Parus" within neighbourhood 2 in Fig. 5 and Fig. 8). Perhaps such an extreme high level of satisfaction in the Lots-Kamyanka neighbourhood is influenced by its proximity to the city's prestigious neighbourhood of "Peremoha". In fact, since the days of late socialism, the former neighbourhood has allegedly been in the shadow of the latter's prestige, and, moreover, uses its infrastructure.

Thus, the intra-urban patterns of neighbourhood satisfaction in Dnipro show that the most satisfied residents live in neighbourhoods with Soviet housing estates of the late socialist era. Meanwhile, the central neighbourhoods also have mostly satisfied residents, but not as much as self-sufficient and socially stable Soviet mass housing estates, which are mainly localised in the semi-periphery of the city. Based on this, the statement of Musterd and Van Kempen (2007) that many dissatisfied residents live in Eastern European housing estates of the postwar period contradicts the empirical results presented above: Soviet housing estates in Dnipro have mostly retained their prestige and have a good reputation. Furthermore, in Dnipro as in some other post-communist metropolises (e.g., Herfert et al., 2013; Szafrańska, 2014; Gorczyca, 2016; Galuszka, 2020), there is a weak and fragmented influence of such a negative phenomenon as the "large housing estate syndrome" (see more Szafrańska, 2013; Szafrańska, 2017), which comprises socio-spatial and physical degradation of a large housing estate and the formation of a negative perceptron image in relation to it among the rest of the city residents.

Only a few neighbourhoods near the industrial zones of Dnipro have degraded physically and socially leading to stigmatisation (see neighbourhoods 4, 6, 29, 30, 32 in Fig. 5), since neighbourhoods with destroyed buildings and rubbish are often identified with the absence of social control, which in turn compromises the sense of order and security of residents and visitors to a neighbourhood (Furr et al., 2005; Hur and Morrow-Jones, 2008). These neighbourhoods of Dnipro near to industrial zones have the most extreme level of dissatisfaction of residents and absolutely none of the empirical factors identified above (Fig. 4) has a significant impact on the residents' assessment of the above-mentioned territories. This group of

neighbourhoods is located mainly on the outskirts of the city and, almost always, has a very low quality of service-infrastructure and environmental (social and natural) conditions. These conditions are typical for remote neighbourhoods with mostly detached housing and for stagnant multi-storey neighbourhoods. Poor quality of landscaping, inability to meet leisure needs, marginalisation, exacerbation of crime and environmental pollution make the above-mentioned neighbourhoods non-self-sufficient (Fig. 7), which reduces their residential attractiveness and stimulates the appearance of negative perceptual images. However, social degradation in the Soviet large housing estates of Dnipro is generally insignificant; instead, the social structure of these neighbourhoods has remained largely unchanged, as workers and people with low social status lived here during the Soviet era. This settlement of various social groups within the city is typical of socialist urban planning: for example, Kovács and Douglas (2004: 242) note that, in Hungary, socialist multi-storey housing estates built in extreme peripheral or environmentally negative places are occupied by low-status households. Dnipro's housing estates built in such locations were not prestigious under communism and did not improve their status in the post-communist period, but the share of such neighbourhoods in the total housing stock of the city is very low (for example, semi-peripheral Soviet large housing estate "Zahidnyi" and peripheral housing estate "Pivnichnyi" within neighbourhoods 4 and 29, respectively, in Fig. 5). Thus, the city of Dnipro inherited a significant socio-spatial unevenness of housing stock from the Soviet past, which is represented by the relative stability of prestige/non-prestige of residential neighbourhoods in the Soviet/post-Soviet period; this directly affects current intra-urban patterns of neighbourhood satisfaction. In general, Sýkora and Stanilov (2014: 6) noted that Soviet housing estates were built as integral parts of the socialist city and were functionally integrated with industrial zones and service centres through a public transport network. Such integration with industrial zones continues to affect the life, health and daily urban practices of Dnipro residents and, accordingly, their neighbourhood satisfaction. The influence of the Soviet legacy is exacerbated by the fact that a weak institutional apparatus of ecological

control was inherited, which still affects the ecological condition of neighbourhoods, because, as noted by French (1995: 118), in Soviet cities more attention was paid to the speed of industrialisation than to the control of urban environment pollution. Thus, post-communist transformations at the neighbourhood level (i.e., large housing estates, inner-city neighbourhoods, etc.) in Dnipro and some other post-communist metropolises can be explained by the fact that, at the beginning of the transitional post-communist period, investments focused on improving central areas and new suburbs, due to the deterioration of old urban areas and large housing estates (Tosics, 2019).

## 5. Discussion and conclusions

The results of the analysed socio-spatial patterns of neighbourhood satisfaction in Dnipro resonate with the results of previous studies (e.g., Gentile, 2005; Hur & Morrow-Jones, 2008; Lu, 2012; Herfert et al., 2013; Todorić & Ratkaj, 2015), which can be considered a good empirical result. At the generalised city level, Dnipro has a "centre–periphery" pattern of neighbourhood satisfaction. However, at a more detailed level of residential neighbourhoods, the city of Dnipro has an intra-urban pattern of semi-peripheralised neighbourhood satisfaction. The process of semi-peripheralisation of neighbourhood satisfaction is associated with the fact that the most satisfied residents are territorially concentrated in semi-peripheral neighbourhoods with self-sufficient housing estates of the late socialism era, which, in general, have predominantly higher values of the neighbourhood satisfaction index than do central neighbourhoods. This confirmed the hypothesis that relatively high neighbourhood satisfaction in Dnipro is observed among residents of neighbourhoods with large Soviet housing estates (which inherited their residential attractiveness and prestige from the Soviet era). These neighbourhoods, as in the post-Soviet period, compete with the central neighbourhoods in terms of prestige and good reputation, while maintaining the heterogeneous social structure that results from the Soviet-era inheritance of inequality of prestige and reputation between neighbourhoods. Paradoxically, the new-build housing estates in the city of Dnipro are mainly gravitating towards the

existing self-sufficient large housing estates of late socialism in order to use their basic infrastructure to save on building new infrastructure to meet new residents' needs. Such a socio-spatial manifestation of the influence of "investor urbanism" creates the phenomenon of pseudo-self-sufficiency of new-build housing estates and, accordingly, generates social tension over the use of social infrastructure of the city neighbourhoods (schools, kindergartens, hospitals, etc.). According to the results of the factor analysis, it was determined that the satisfaction of Dnipro's residents with their neighbourhoods is most influenced by the infrastructure availability factor and environmental factor, although the strength of their impact differs between neighbourhoods.

Based on the empirical results of the study of neighbourhood satisfaction in Dnipro and the relevant literature review (Underhill, 1990; French, 1995; Kovacs & Douglas, 2004; Gentile, 2005; Sýkora & Stanilov, 2014; Gentile, 2015, Krišjāne et al., 2019, etc.), the hypothesis that the "Soviet" factor or set of Soviet legacy factors plays a very important role in the formation of current patterns of neighbourhood satisfaction was confirmed. Thus, in the city of Dnipro, due to the influence of the above and other external factors, the current pattern of neighbourhood satisfaction is semi-peripheralised. Despite the semi-peripheralisation of neighbourhood satisfaction in Dnipro, there are stigmatised residential neighbourhoods, which are mainly localised in the outskirts, but their number is very small, so urban stigmatisation is insignificant in the city. However, the analysis of the neighbourhood differentiation according to the level of neighbourhood satisfaction indicated that the process of stigmatisation of Soviet mass housing estates in Dnipro is observed only in neighbourhoods that gravitate to the industrial zones of the city. Similarly, this is true for neighbourhoods with mostly detached housing near these zones. Generally, the most dissatisfied residents live in neighbourhoods that gravitate to the city's industrial zones or in neighbourhoods isolated from the basic urban and social infrastructure. In most of these residential neighbourhoods, respondents report a bad criminogenic situation and poor air quality, which affects residents' sense of security, social activity and health.

Nevertheless, the vast majority of neighbourhoods with Soviet-era large housing estates have a good social reputation and high satisfaction scores among their residents, which indicates the minimal impact of the "large housing estate syndrome" on cities' large housing estates of the late socialism era and refutes Musterd and Van Kempen's (2007) claim that there are a lot of dissatisfied residents living in post-war Eastern European housing estates. Therefore, the author shares the opinion of Galuszka (2020: 4) that "(e)states in CEE are today significantly more likely to be considered good places to live than in Western Europe, either because of their characteristics or due to external factors such as limited availability of alternative forms of housing".

Summarising the above, urban post-communist/post-Soviet development in Dnipro certainly has some common and some different trajectories as compared with post-communist cities in Central and Eastern Europe and post-Soviet cities. One of the main and perhaps unique features of the intra-urban pattern of neighbourhood satisfaction in Dnipro is semi-peripheralisation of neighbourhood satisfaction as a result of the influence of various factors (including Soviet legacy factors). Undoubtedly, the privileged closed status of the former Dnipropetrovsk in Soviet era influenced the development of a "belt of self-sufficient" and socially stable large housing estates, intended to serve as bedroom communities for workers from priority and secret Soviet enterprises and their families, which still makes them prestigious enough residential neighbourhoods, sometimes even with elements of mythologising their prestige.

Also, the post-Soviet urban transformations identified within the Dnipro case show that the residential neighbourhoods oscillating between Soviet legacy and "spontaneous" post-(communist/Soviet) urban transformations are largely the result of "investor urbanism". As in post-Soviet Tbilisi (see Van Assche & Salukvadze, 2012), the space between the historic neighbourhoods of Dnipro and the "new" Soviet mass housing estates has fallen victim to "investor urbanism", despite gated communities also being common. At the same time, the city centre also fell victim to "investor urbanism" due to the compaction of buildings and growth of residential development (i.e., residential verticalization and renovation/gentrification). According to the presented empirical results, in Dnipro, as well as in other cities of Ukraine (see Mezentsev & Denysenko, 2018), the post-communist transition is still not complete, which is not something new for cities in other countries of the former Soviet bloc (see Sýkora & Bouzarovski, 2012). Thus, having studied the post-Soviet urban transformations and their impact on neighbourhood satisfaction in the case of the former Soviet Union metropolis, it was found that a phenomenon of "spiral of degressive post-Soviet urban transformations" is observed in Dnipro, Ukraine. The "spiral of degressive post-Soviet urban transformations" is understood here as a spatio-temporal process of sequential urban development from the USSR's collapse to the end of post-Soviet urban transformations as the "self-consistent termination" of the post-Soviet transition spiral. The degressive nature of urban transformations in Dnipro is confirmed by the simultaneous stagnation and regeneration of chaotic inner-city regenerations under the influence of "investor urbanism", and the significant influence of the Soviet legacy (the impact of which will weaken in the future). Accordingly, the recorded semi-peripheralisation of satisfaction with the Soviet-type neighbourhoods in Dnipro may generally disappear in the very long-term perspective, but the Soviet mythologised prestige among the post-Soviet housing estates in these urban neighbourhoods will still persist. That is, over time, the Sovietness of semi-peripheralisation of neighbourhood satisfaction in Dnipro will weaken *via* the moral obsolescence of Soviet-era large housing estates and the growing fragmentary physical deterioration of the Soviet housing stock of semi-peripheral neighbourhoods, especially in terms of the deterioration of water, electricity and heating networks, the reducing attractiveness of Soviet-style playgrounds, etc. I assert that this phenomenon expands the place of the post-Soviet context in the already inspiring concepts of "multiple transformations of post-communist urban transition" (see more Sýkora and Bouzarovski, 2012) and "heteropolitanisation" (see more Gentile et al., 2012) and reflects the long-standing post-Soviet urban transformations.

## 6. Notes

1. Pivdenmash (Pivdennyi Machine-Building Plant) and the "Pivdenne" Engineering Design Bureau were secret Soviet-era military enterprises located in Dnipro[petrovsk] that specialised in the construction and production of ballistic missiles for the needs of the USSR military defense complex beginning in the 1950s. It is because of the high priority and importance of these enterprises that the city received the status of a closed administrative unit.

2. Based on a random sample of 125 voting precincts, 1258 respondents were interviewed in Dnipro. But for ten of them, difficulties arose with attribution to a particular residential neighbourhood. Therefore, in the current study, the author used a sample of 1248respondents – without respondents from voting precinct 104. A detailed method of sampling for Dnipro's survey is described at the following link: https://www.tandfonline.com/doi/suppl/10.1080/14650045.2020.1830766?scroll=top (28.03.2022)

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**Appendix 1.** Descriptive statistics of respondents' answers at different intra-city scales

| No. of neighbourhood | No. of respondents | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 |
|---|---|---|---|---|---|---|---|---|
| 1 | 51 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 98.0% | 90.2% | 98.0% |
| 2 | 20 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 95.0% | 65.0% | 100.0% |
| 3 | 50 | 100.0% | 100.0% | 98.0% | 100.0% | 98.0% | 88.0% | 88.0% | 100.0% |
| 4 | 20 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 85.0% | 100.0% | 100.0% |
| 5 | 63 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 98.4% | 95.2% | 98.4% |
| 6 | 40 | 100.0% | 100.0% | 97.5% | 100.0% | 100.0% | 97.5% | 95.0% | 90.0% |
| 7 | 10 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 60.0% | 100.0% |
| 8 | 61 | 100.0% | 98.4% | 100.0% | 100.0% | 100.0% | 88.5% | 72.1% | 96.7% |
| 9 | 62 | 100.0% | 98.4% | 100.0% | 100.0% | 100.0% | 90.3% | 88.7% | 98.4% |
| 10 | 20 | 100.0% | 100.0% | 100.0% | 100.0% | 90.0% | 85.0% | 100.0% | 100.0% |
| 11 | 31 | 100.0% | 96.8% | 100.0% | 100.0% | 100.0% | 80.6% | 93.5% | 100.0% |
| 12 | 30 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 86.7% | 76.7% | 96.7% |
| 13 | 47 | 100.0% | 93.6% | 97.9% | 100.0% | 97.9% | 95.7% | 93.6% | 95.7% |
| 14 | 96 | 100.0% | 95.8% | 100.0% | 100.0% | 99.0% | 91.7% | 94.8% | 93.8% |
| 15 | 50 | 100.0% | 98.0% | 100.0% | 100.0% | 98.0% | 90.0% | 76.0% | 92.0% |
| 16 | 55 | 100.0% | 92.7% | 100.0% | 100.0% | 96.4% | 92.7% | 81.8% | 85.5% |
| 17 | 30 | 100.0% | 100.0% | 100.0% | 96.7% | 93.3% | 70.0% | 80.0% | 86.7% |
| 18 | 40 | 100.0% | 100.0% | 100.0% | 100.0% | 97.5% | 97.5% | 97.5% | 100.0% |
| 19 | 35 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 94.3% | 100.0% |
| 20 | 30 | 100.0% | 100.0% | 96.7% | 100.0% | 96.7% | 83.3% | 93.3% | 100.0% |
| 21 | 50 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 90.0% | 88.0% | 96.0% |
| 22 | 60 | 100.0% | 98.3% | 100.0% | 98.3% | 98.3% | 80.0% | 70.0% | 98.3% |
| 23 | 20 | 100.0% | 100.0% | 100.0% | 100.0% | 95.0% | 90.0% | 85.0% | 100.0% |
| 24 | 30 | 100.0% | 100.0% | 100.0% | 96.7% | 100.0% | 83.3% | 93.3% | 93.3% |
| 25 | 30 | 100.0% | 100.0% | 100.0% | 96.7% | 100.0% | 66.7% | 90.0% | 90.0% |
| 26 | 30 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 90.0% | 93.3% | 100.0% |
| 27 | 50 | 100.0% | 98.0% | 100.0% | 100.0% | 100.0% | 90.0% | 82.0% | 100.0% |
| 28 | 26 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| 29 | 20 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 95.0% | 95.0% | 100.0% |
| 30 | 20 | 100.0% | 95.0% | 100.0% | 100.0% | 100.0% | 95.0% | 95.0% | 100.0% |
| 31 | 10 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 80.0% | 80.0% | 100.0% |
| 32 | 51 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 94.1% | 96.1% | 100.0% |
| 33 | 10 | 100.0% | 100.0% | 100.0% | 100.0% | 90.0% | 90.0% | 60.0% | 80.0% |
| Total | | N=1248 | N=1230 | N=1244 | N=1244 | N=1233 | N=1125 | N=1094 | N=1204 |
| | | | | | | | | | |
| Core | 153 | 100.0% | 98.7% | 100.0% | 100.0% | 98.0% | 89.5% | 93.5% | 99.3% |
| Semi-periphery | 696 | 100.0% | 98.6% | 99.6% | 99.6% | 98.9% | 89.1% | 86.5% | 95.4% |
| Periphery | 399 | 100.0% | 98.5% | 99.7% | 99.7% | 99.0% | 92.2% | 87.5% | 97.2% |
| Mixed housing | 153 | 100.0% | 98.7% | 100.0% | 100.0% | 98.0% | 89.5% | 93.5% | 99.3% |
| Mostly detached housing | 479 | 100.0% | 98.5% | 99.4% | 99.6% | 98.7% | 90.6% | 85.6% | 96.7% |
| Mostly multi-storey housing | 616 | 100.0% | 98.5% | 99.8% | 99.7% | 99.0% | 89.9% | 87.8% | 95.6% |
| | | | | | | | | | |
| Core with mixed housing | 153 | 100.0% | 98.7% | 100.0% | 100.0% | 98.0% | 89.5% | 93.5% | 99.3% |
| Semi-periphery with mostly multi-storey housing | 566 | 100.0% | 98.4% | 99.8% | 99.6% | 98.9% | 89.8% | 87.3% | 95.2% |
| Semi-periphery with mostly detached housing | 130 | 100.0% | 99.2% | 98.5% | 99.2% | 98.5% | 86.2% | 83.1% | 96.2% |
| Periphery with mostly multi-storey housing | 50 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 92.0% | 94.0% | 100.0% |
| Periphery with mostly detached housing | 349 | 100.0% | 98.3% | 99.7% | 99.7% | 98.9% | 92.3% | 86.5% | 96.8% |

Notes: How do you evaluate your neighborbourhood in terms of such indicators on a scale of 1 to 5 (1 – very bad, 5 – excellent)? (Q1) Air quality; (Q2) Choice of shops, supermarkets; (Q3) Landscaping, organisation of public services and amenities; (Q4) Public transport; (Q5) Criminogenic situation; (Q6) Choice of entertainment places of different types; (Q7) General social situation
Sources: Dnipro survey, 2018; author's calculations