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# *Segregation in Minds*

*Analysis on the Statistical and Mental-based Socio-spatial  
Segregation in a Hungarian City*



*Abstract* In this paper, I explore socio-spatial segregation from a particular perspective, which may probably be considered a novelty in the investigation of spatial social patterns, as it focuses on questions such as: What kind of distinction occurs between socio-spatial patterns designated by statistical data and the cognitive representations of those patterns in people's minds? and What explains these differences, and what kind of impact can they generate?

*Keywords* mental map, cognitive representations, segregation, social-spatial segregation

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## Research background

This study summarizes a 10-year-long investigation on the socio-spatial pattern of a Hungarian city, Szeged and its alterations represented on the mental map of the Szegeders involving qualitative and quantitative types of research methods and statistical data.

The main motivation to study the socio-spatial segregation within the city of Szeged was presented by the theoretical and methodological criticism of Gábor Csanádi, Ferenc Ekler, József Hegedűs, János Ladányi and Iván Tosics (EKLER – HEGEDŰS – TOSICS 1980; CSANÁDI – LADÁNYI 1988; LADÁNYI 2008), and their results gained from investigations on the diverse segregation patterns of different social classes.

The research has undergone several changes with respect to its methodology in the past 10 years. Initially, we based our works exclusively on quantitative methods, particularly on sampling, and investigated relevancies of social-spatial differentiation models set up by classical urban sociology theories in the case of Szeged. Rightful and constructive professional criticism of our research's initial direction induced us to extend the theoretical framework of the research problem, and investigate it from different methodological aspects as well. Besides the sociological approach of socio-spatial segregation, we also extended our attention to theories of socio-geography and urban economics. In addition to the interdisciplinary expansion of conceptual framework, the methodological perspective of the research problem we studied was likewise enriched which built on the theory of combining more research methods together.

We grasped the issue of socio-spatial segregation from a peculiar perspective, which may be probably considered a novelty in the investigation of territorial-spatial social patterns, as it focuses on questions like 'what kind of distinction occurs between socio-spatial patterns designated by statistical data and the cognitive representations of those existing in people's minds?', and 'what explains these alterations, and what kind of impact can it generate?'

By analysing the results of qualitative and quantitative surveys, we justified that significant changes in the urban structure are still decisive forces on boundaries of cognitive structures appearing on mental maps, whereas former borderlines between historical districts are tend to exist only in minds – cognitive maps –, and solely those urban areas present distinctions in this sense that used to be independent settlements earlier.

Our scientific attention was turned to the problem of real and cognitive socio-spatial segregations during the investigation on the correlations between cognitive structures and historical districts. For the study of this problem, we performed an experiment in which we scrutinized primarily the areal position of two social groups (low or high-status, poor or rich population, as it was defined during our surveys) that could be well determined and distinguished by using the latest census data in delimitations of different areal units, subsequently we compared these with their later positions on mental maps occupied seven, eight, and nine years afterwards.

The analysis accomplished on the 2001-census data also verified in the case of Szeged what had already been articulated by others earlier (LADÁNYI 2008), namely that indexes marking the spatial segregation – in case of the usually applicable, relatively extensive territorial delimitations – of the people occupying the bottom of social hierarchy are lower than those on the top. This theory proved to be peculiarly true in case we determine segregation index by means of its projection on greater areal units. Thus, segregation, which exists anyway and is concentrated in smaller territorial units, became invisible as a consequence of greater social heterogeneity in the area.

To carry out an experiment, we investigated whether segregated areas with certain social at-

tributes exist on the Szegeders' cognitive maps, or not; and if so, to what extent are these identical to our results of the analysis on socio-spatial segregation retrieved from the 2001 census data? Ranking by the territorial ratio of those residents of Szeged who were classified as low-status group according to census data (educational attainment, and employment status) exhibited identity to the results of none of the years in which mental mapping was conducted; however, the population belonging to the high-status group bore strong resemblance to the ranking of residential areas of the wealthy in the mental mapping surveys.

Results of the mental mappings indicated similar cognitive structure in the case of segregation between rich and poor in all three years of surveying. Conclusively, we introduced and defined the notion of 'mental segregate', as being territorial units where determinant adjectives corresponding to mental spheres displayed on mental maps, or the frequency of the mentioning of stereotypes bearing identical content were extraordinary.

We proposed three possible explanations for the accuracy or inaccuracy of mental maps: as for the 'static explanation', and the 'dynamic explanation', we explained the diversity of patterns of the society's spatial arrangement in minds in the first case with the particularities of the group-specific territorial location of the real distribution (static), and in the second case with the difference occurring in the frequency of the measures of urban rehabilitation by target areas (dynamic).

The third, 'stereotypical explanation' implies that distinctions between real and cognitive spatial patterns in different social groups' notions are generated by stereotypes relating to mental maps. With respect to the stereotypical explanation of the distinction between real and cognitive socio-spatial patterns, the scientific question arose whether exaggerating stereotypical explanations that are related to areas comprising different segregates have any kind of impact. We adopted the urban economic theoretical approach on external impacts (LENGYEL – MOZSÁR 2002, KANEMOTO 1996) relating to the judgement of areas comprising segregates of different quality. We expressed degrees of the external impact characterising individual districts in the value distinction between areal results of the dissimilation and mental dissimilation indexes, and we ranked urban areas subsequently upon the indicators of the 2001 base year and three survey years, then we tested/challenged the coherence on the grounds of the correlations among ranking lists. On the basis of the results, we concluded that external impacts deriving from stereotypes prevail most intensively in areas consisting of segregates.

During the course of this research, we apply the combination of qualitative and quantitative methods in the analysis of the 'real' and mental socio-spatial patterns of Szeged, so as to highlight the methodological problems of territory-based socio-scientific analyses through the examples of results that we obtained from a variety of analysis procedures. The thesis can be regarded as interdisciplinary from a methodological point of view, since the various survey methods and research issues that provide the empirical basis of the study represent the subject and methodology of several other disciplines (sociology, economy, socio-geography, social psychology, cultural anthropology, urban studies).

The main direction of my study is represented by the empirical analyses of the following hypotheses:

Dominant segregate hypothesis: Segregates appear on maps regardless of their type.

Mental segregate hypothesis: boundaries that appear on mental maps do not correspond to the segregate boundaries measured and delimited upon quantitative datasets; boundaries of mental segregates are more extensive.

Stereotypical externality hypothesis: Stereotypes related to segregates cover greater units of the urban structure comprising these – districts in the case of Szeged –, and have positive or negative external effects on them.

All three of our hypotheses have been proved to be true during our investigation.

### **Applied methods**

In our opinion, the typology delineated by Peter Blau, which is used most frequently in urban sociology, can be perfectly applied for the determination of the complex of parameters deciding spatial segregation on the grounds of social status (BLAU 1976, ANGELUSZ 1999. 359–382.), therefore we employed the structural parameters included in this typology for the determination of the social position of individual units of analysis in the quantitative phase of our research, the operationalisation and the analysis.

On one hand, the extension of territorial units represents one of the major methodological problems in researches dealing with the correlation between social stratification and spatial segregation, and on the other hand, the strongly correlating sample size does another. We would be able to obtain the most accurate data possible from similar analyses, if we were aware of those parameters of the total population that determine social stratification; however, we are unable to fulfil the latter in most of the cases. Such opportunity to detect individual parameters of the total population in Szeged is the ten-yearly population census. Nonetheless, the nominal and gradual parameters determined by Blau are not recorded even in this data collection affecting the entire population, only a few of them, involving gender, age, educational attainment, domicile, occupation, marital status, workplace, nationality and religion.

Results of Hungarian urban sociological investigations indicate that in the case of spatial segregation by social strata – within the list of parameters by Blau – those parameters can be well defined by which spatial segregation can be distinguished most apparently (LADÁNYI 2008). On the basis of his investigation conducted in Budapest, János Ladányi classifies the parameters including age, educational attainment, workplace and occupation into those ones by means of which spatial segregation by social strata can be detected most precisely.

I intend to give an overview of the changes occurred in the spatial pattern of Szeged city's society between 2001 and 2010 on the basis of objective data and those retrieved from mental maps, employing five different research methods:

- Source analysis
- Observation
- Mental mapping
- Survey by questionnaire
- Secondary analysis

The techniques of investigation we employed are based on the incorporation of quantitative and qualitative methods, which provide high levels in both reliability and validity. Our method of investigation ranges on a qualitative-quantitative scale whose endpoints are represented by 'field-near' (qualitative) and 'field-distant' (quantitative) techniques for achieving higher degree of reliability and validity (LETENYEI 2004. 56–66).

Our point of view is that only and exclusively valid research results are worth considering, although one has to endeavour to achieve adequate level of reliability. The greatest advantage of combining these two methods of data collection is that it ensures data of higher validity and reliability for analysis by the fact that the definition of research question and its relevance become

more established as a result of qualitative collections in the field, thus providing higher level of validity in terms of questions to be articulated by the quantitative research phase.

During our data collection in the quantitative phase of the research, we could work with such questions by incorporating more methods – completed on a sample of a large number of items and therefore providing high reliability – because of the already processed qualitative results whose validity is greater as well. We ensured higher validity in the case of the survey, which is anyway highly reliable but less valid as a consequence of inappropriately articulated questions, by formulating questions for the quantitative measurement device on the basis of the high validity data yielded by the fieldwork prior to developing the device itself. There is a recommended sequence of different methods during a research that involves the abovementioned combination of data collection techniques that is advancing from qualitative data collection techniques toward quantitative procedures. Any variation from this sequence or swapping of the two techniques of data collection would occur in one case, namely in the cases of fieldwork and secondary analysis, when the secondary analysis of data obtained from previous results in the research topic can overtake fieldwork phase (LETENYEI 2004).

We begin our research in the thesis topic with the examination of the documents introducing the society of Szeged, then with a jump to the ‘field-near’ end of the axis/scale we continue with data collection that ensures high validity regarding the built-up environments of different urban areas and distinctions among social composition of the various districts by applying observation technique. Conclusions of this research phase generate the articulation of the study’s research problem, and the decision to set up hypotheses in further phases of the study about socio-spatial segregation in Szeged, and to employ methods for its measurement at a higher scale of reliability.

Secondary analysis represents one of the higher measurement methods, in which we analysed the Hungarian Central Statistical Office’s (HCSO) population census data on the total population of Szeged involving variables of the completed level of education and age. We recognise socio-spatial distinctions by census districts on the grounds of these parameters taken from 2001.

In the phase of secondary analysis the following two reasons induced us to take into account exclusively the number of years of school completed and age:

Researches focusing on segregation in Hungary indicated that these variables (and particularly the completed level of education) are the most dominant factors in the social composition of segregates. (LADÁNYI 2004) The other reason is that on the level of evolvable variables census data were restricted to these parameters both being applicable on two higher measurement levels, and as determinants of social status.<sup>1</sup>

Data collection necessitated by the mental mapping was conducted in the quantitative research phase, specifically focusing on the stereotypical notions of individual areas, and expressly on the cognitive perception and localization of areas resided by low class (poor) and higher-class (wealthy) people.

In this section of the thesis, we analyse the spatial segregation of Szeged’s society on the basis of two determinant structural parameters of social stratification, and its extension, as well as the mental representation concerning spatial locations of the various social groups in the mind of Szegeders.

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<sup>1</sup> Census data consist even of economic activity and employment status, which belong to the gradual parameters of social stratification; furthermore, gender/sex and ethnic identity, which are to be classified as nominal parameters (BLAU 1976, ANGELUSZ 1999). Nonetheless, we did not consider these variables practical to involve in the analysis due to the low level of their measurement and previous results obtained from segregation researches.

We make an attempt to introduce how the research on spatial segregation of the urban society can be interpreted with the help of qualitative and quantitative approaches, the secondary analyses of the 2001 census data, as well as of observation and three survey questionnaires. We determine objective and subjective (mental dissimilation) index values assigned to individual areas of the city from larger territorial units to the smallest delimitations possible (functional residential area – district – census tract – census block, and interpret the internal differentiation of Szeged upon these. The main questions of our analysis is partly of methodological nature and partly concerns Szeged's internal divisions. The methodological issue is to what extent the results obtained through mental mapping diverge from or are in accordance with results retrieved from quantitative data. A further methodological question is how much mental mapping, as a method, is eligible to assess the spatial movement processes of the urban society, and the effects of urban planning interventions.

During our analysis we strive to better understand what kind of alterations or similarities of the separation, segregation of high and low-status population of Szeged by residential areas can be indicated by which analytical technique, in other words, how much the objective and subjective interpretations of the population's segregation are in correspondence to each other.

We considered the application of source and document analyses – as a method of data collection – concerning the socio-spatial analysis of Szeged effective, because documents, descriptions and social scientific and sociological studies emerging on the occasion of the 1879 Great Flood, which was a determinant event in the city's life, refer unequivocally to the fact that it had a significant impact on the history of the development and society of Szeged (LECHNER 2000, BÁLINT 1959, ERDEI 1971, BÁLINT 1976, KOVÁCS 2003).

Results of document analyses completed on the socio-spatial pattern of Szeged generated further research questions in the qualitative phase, namely that:

What does the current spatial structure of Szeged look like?

How much do individual parts separate from each other by the function and physical characteristics of residential buildings?

Can one sense some kind of heterogeneity concerning the composition of local society?

In what spatial and social categories do the people of Szeged think about their city?

To put it otherwise and correlate with a specific research method: how are the city and its population represented on the mental map of Szegeders, and what parts, areas, groups and social categories build them up?

For testing the relevancy of research questions articulated in the first research phase, we simultaneously applied two data collection techniques subsequently: besides observations taken during the city's visit, we made unstructured interviews with residents of the given districts. For selecting the study subjects, we applied the technique of convenient sampling (Babbie 2003:205-206), as we did not aim to perform representative sampling at that research phase, however, we sought to select respondents who possibly bore different demographical attributes. During the course of our observations conducted in the period between 2002 and 2007, we conducted some 150-200 short discussions.

### **Conclusions of the qualitative research section**

As a conclusion to data collection accomplished through observation, we ascertained that the building stock of Szeged has more or less preserved its traditional arrangement by districts even today with respect to physical and functional attributes. It can also be perceived that tradi-

tional distinctions among urban areas are gradually vanishing in terms of both the appearance of new buildings and the social characteristics of their residents. The onetime historical districts are steadily losing their particular faces with respect to their characteristics – in case of both the build-up environment and the social homogeneity –, and thus their borders are slowly blurring. Former boundaries of the historical districts tend to exist only in minds – on cognitive maps. Some difference is presented by those neighbourhoods that used to be independent settlements. Borderlines between these once independent areas and Szeged were and still are sharper (dyke, railway, main road), and can rather be interpreted as fault line, whose influence can be detected on cognitive maps as well.

### Conclusions of the quantitative research section

During the secondary analyses of the 2001 census datasets of the HCSO, we analysed segregation and dissimilarity indexes<sup>2</sup> of Szeged's inhabitants, which can be classified into categories of unemployed people in active working age with low educational attainment, and those in active working age (low-status), and white-collar workers with high level of education (high-status)/unemployed people in active working age with low educational attainment (low-status), and those white-collar workers with high level of education in active working age (high-status) in four territorial distributions / divisions.<sup>3</sup>

Segregation indexes exhibited different results regarding the extension of different status groups and delimited territorial units. The larger an individual unit is, the smaller the segregation indexes of studied groups are. The difference between segregation indexes are striking between low and high-status groups in the largest areal unit, namely functional residential areas. It can be detected in this territorial delimitation that high-status people are prone to segregate more intensely, whereas low-status people are not. But at the same time, if we compare the ranges of the segregation indexes by territorial units group by group, significant differences are produced. The extension of territorial delimitation has a great impact on the values of the low-status groups' segregation indexes. In the case of the territorial delimitations of Szeged, the delimitation on census tract level is the unit, in which segregation index values of either status groups converge. Hence, the segregation curve represents J shape in case of great territorial delimitation, while as a consequence of decreasing areal units in Szeged, it nearly followed U shape. Such a significant J-shaped curve cannot be experienced by means of decreasing the level of territorial analyses either, as in Budapest or other bigger European cities (LADÁNYI 2005. 147.) which can be interpreted by different social composition.

We created two groups for high-status people during the analysis, as a risk of error emerged, namely that we could have specified group boundaries for people in the highest social status too loosely – since we classified occupations falling under the determination demanding high and medium level education into this group.

This could have led to the conclusion that we compared the segregation indexes of middle class strata characterised by low territorial segregation with indexes of the low-status inhabitants. In order to make sure how much this category classified into the high-status group influence our

<sup>2</sup> We determined active working age between 18 and 60; low level of educational attainment at 8 or less completed classes. Categories of white-collar workers were the following: legislator, leaders of the administration and trade unions, occupations involving independent application of university degrees, other occupations demanding high or medium level education.

<sup>3</sup> Grouping variables of the database enabled these four different territorial distributions.



results, we created another high-status group from which we extracted occupations requiring other high or medium educational level, and likewise calculated its segregation and dissimilarity indexes. Results did not alter remarkably.

Consequently, results assessed on census data support those declarations in Szeged's case as well according to which indexes of those occupying the bottom of the hierarchy indicating spatial segregation – in case of the generally used, relatively extensive territorial delimitations (functional residential zone, district) – are lower than those being on the top. Our investigation apparently verifies that this theorem is definitely valid in the case when we determine segregation indexes on the basis of larger territorial units, which as a consequence of social heterogeneity within the area overlap, and conceal segregation, otherwise existing and concentrating in smaller territorial units. The reason for this is that high-status people can concentrate according to their own volition; they can afford, and they are able to choose the residential area they prefer, whereas the poor cannot afford this from their own resources, therefore they are compelled into micro-segregates, where they concentrate occupying smaller areal units (LADÁNYI 2007. 199–215).

As a conclusion of the thesis we articulated three interpretations concerning distinctions in the socio-spatial patterns retrieved from statistical data and mental maps:

### **Dynamic explanation**

By means of our dynamic interpretation concluded by the research, we can detect distinctions between statistical data and cognitive socio-spatial segregation patterns in that urban renewal measures dominantly affect residential areas of the low-status population; greater degree of transformations and various urban ecological processes emerge in these areas frequently due to interventions. Habitats of the high-status inhabitants indicate greater permanency, large-scale changes do not occur in these areas. Spatial distribution of the low-status population could have changed as a consequence of rehabilitation interventions taken place in Szeged after 2001, which was projected on mental maps as well; while location of the high-status people, which had already been fixed in minds, remained unchanged.

### **Static explanation**

In accordance with the research results produced by Ladányi and his associates, as well as our analyses concerning Szeged low-status population's areal concentration indicates territorial homogeneity only in the case of smaller territorial units, in other words, areas populated by the poor, the so-called micro-segregates are strongly dispersed within the city. Consequently, cognitive maps of urban districts constructed through individual experience indicate intense dispersion in minds due to the same characteristics of poor residential blocks/areas, and thus subjectivity is more prevalent concerning location. On one hand, people can encounter poor micro-segregates scattered in various portions of the city; on the other hand they meet those smaller units resided by poor people frequently that concern their day-to-day visits, thus their cognitive territorial judgement tend toward those areas. Urban areas that are believed to be resided by the poor are, on one hand, characterised by greater degree of dispersion in minds on the basis of location, and on the other hand, categorisation concerns more areas as a consequence of this tendency. In contrast to the latter, one can encounter areas populated by high-status people that overlap greater territorial unit only in well separated and defined districts, thus distinctions in the subjective daily experience do not induce distortive effects on cognitive maps; these bear stronger resemblance to real spatial social arrangement. During our research we defined the



term of mental segregation, which stands for those territorial units that exhibit definite alteration from other mental spheres with respect to determinant adjectives marking mental areas on mental maps, or the frequency of mention of stereotypes carrying identical content.

We supplemented the theory of easily learnable, 'readable' city (LYNCH 1960; cited by CSÉFALVAY 1990), which throws light on that relatively accurate cognitive map can be created easily and quickly about clearly sectioned cities that are characterised by particular architectural environment, with the statement that relatively precise cognitive map can be created about cities that can be described by more homogeneous socio-spatial segregation.

Based on our research results, in our opinion we can make the general statement by means of our two abovementioned explanations that the accuracy of mental maps are heavily influenced by two factors, as for the analysis on the cognitive representation of either physical or social spheres:

- dynamic factor: frequency of the spatial change of the analytical units (fault lines, borderlines, landmarks, mental spheres, stereotypes),
- static factor: spatial extension of analytical units

### **Stereotypical explanation**

We created an index, called mental dissimilation index to measure territorial disparities on the basis of the frequency of mention of areas populated by the poor or the rich.

Mental dissimilation index measures the spatial distribution of the mental representation of two cognitive categories. This indicator is basically symmetric, i.e. functions and sequence of the two compared distributions are exchangeable. The calculation is, in substance, performed upon the formula in which one totals absolute values of the distinctions among territorial units of the percentage of the two cognitive categories relating to given mental territorial units, and divides them by two.

Values can range between 0 and 100 in the case of mental dissimilation index as well. If a certain stereotype is not associated with a mental spheres in minds, its value converges to the low limit value, while in case of the connection of a certain stereotype to a certain area it moves toward the upper limit. The value of mental dissimilation index calculated for each district of Szeged relying on the 2007, 2009 and 2010 datasets we study the mental spatial distribution of the low and high-status population.

With reflection to the results, we articulated a third explanation, namely stereotypical explanation. This explanation virtually involves – in case of the distinction among real and mental spatial patterns of various social groups' – categorisation, and the frequency and extension of exaggerating attitudes accompanying categories, which characterise stereotypes associated with mental spheres.

Concerning the stereotypical interpretation on the distinctions between real and cognitive socio-spatial patterns we raised the question in connection with further investigations whether exaggerating stereotypical explanations have some sort of impact, or one can detect such external impact that is a possible consequence of the distortion of cognitive spatial pattern, or not.

The main direction of the research is right in compliance with the analysis of stereotypes relating to territories, during which we shed light on the fact that negative stereotypes associated with districts of Szeged correlate unequivocally with the presence of ethnic segregates in those areas. Our results reinforce that suchlike areas represent only relatively small portions of districts, nonetheless, negative stereotypes concern whole districts, in other words, they have negative external impact on districts. \*

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