

# SPATIAL ORGANISATION: DEVELOPMENT, STRUCTURE AND APPROXIMATION OF GEOGRAPHICAL SYSTEMS

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## Abstract

*Various issues concerning spatial organisation as a theoretical construct are discussed in this paper. Some basics of the theoretical background and a literature review on the subject matter, not aspiring to completeness, are provided. Three thematically-related research projects, which are currently underway in conjunction with several Czech academic and scientific institutions, are then presented. These projects are concerned with issues of a spatial organisation of geographical systems from the human geographical point of view. Each project is then discussed with respect to both theoretical-methodological bases, as well as presentation of some of the research results.*

## Shrnutí

### **Prostorová organizace: vývoj, struktura a aproximace geografických systémů**

*Příspěvek se zabývá problematikou prostorové organizace. Nejprve uvádíme základní a úvodní teoretické pozadí a rešerši literatury týkající se tématu, bez aspirace na úplnost, posléze navazujeme představením třech tematicky spojených výzkumných projektů zabývajících se problematikou prostorové organizace geografických systémů z humánně geografického pohledu, které jsou aktuálně řešeny v rámci spolupráce několika českých akademických a výzkumných pracovišť. Každému projektu je věnována jako teoreticko-metodologická pasáž tak představení některých výsledků výzkumu.*

## 1. Introduction

Organisation of the environment of an individual and a society objectively exists since the dawn of the humankind. Only historically recently has this originally unconsciously reflected reality become a research issue, when, regarding the research subject and object, a key role is being played by geography. At first, theoretical and practical issues of the spatial organisation of the settlement system were studied in relation to agricultural production (von Thünen, 1826), industrial locations and resource distributions (Weber, 1909) or commerce and services (Reilly, 1931; Christaller, 1933). Eventually the phenomenon of the spatial organisation freed itself from the primarily economic platform and moved towards the social and cultural issues (e.g. Hägerstrand, 1953). A spatial dimension is thus comprised also in the human behaviour which changes faster than classic economic processes.

The Czech Republic has been going through a crucial social-economic transformation since 1990, which is deeply reflected in the change of spatial organisation and human behaviour, when several generations have completely changed their cultural and social customs. Among the realms having been influenced most we rank services, retail and leisure, which are primarily related to daily activities of the population of a nodal region. These changes are of the great interest for geographers since they also affect delineation of regions and their inner structure.

It was by the end of 2008 when geographers from several institutions joined to form an informal research group tackling from different points of view questions of the spatial organisation of geographical systems, their development, structure and approximation.

Since 2009, the research of the spatial organisation of the geographical environment has been supported by three scientific grant projects. They are handled by the Department of Geography, Palacký University in Olomouc; Department of Regional Economics and Administration, Masaryk University in Brno; Department of Environmental Geography, Institute of Geonics, Academy of Sciences of the Czech Republic; Department of Geography and Regional Development, University of Ostrava; and Department of Geography, University of South Bohemia in České Budějovice.

The primary objective of this report is to introduce these thematically loosely related, but sufficiently distinct research projects in a following manner: first (section 3) some basic theory and methodology regarding each project is briefly presented, and second (section 4) some of the first results are put forward. The report should be taken as a communication to the professional public representing the recent work of our research group. As all three projects are in a way related under the heading of the spatial organisation, section 2 briefly hints at some features of the concepts, without any aspiration for completeness or construction of a new “theory”. It just puts forward some of our opinions on the subject matter.

## 2. Spatial organisation: a concise theoretical discussion

The concept of the spatial organisation, which has been for decades one of the basic geographical research themes enabling both theoretical enquiry and practical applications, has not been in our opinion clearly defined so far. Neither is it obvious how to tackle the concept theoretically and methodologically. These facts are caused by the immense complexity of the concept, which can be roughly matched to the whole object and subject of human geography as a scientific discipline, and also by different geographical traditions across the world. The Anglo-Saxon authors understand the spatial organisation in several different ways, which, however, have a strong common basis in the relatively wide conception of the issue.

Especially two works by Haggett (1965) and Morrill (1974) that seem to be more focused on the topic have been more inspiring, particularly the latter. Haggett (1965) in his book on “Locational Analysis in Human Geography” introduces an interesting view of the organisation of a region, later refined by him in “Geography: a global synthesis” (Haggett, 2001). He sees five region-building or spatial structure factors: movements, networks, nodes, surfaces and diffusion stages. He also introduces a concept of hierarchies into his concept. Such an approach is more aimed at the subject in question.

In his book fittingly named “The Spatial Organization of Society” Morrill (1974) provides many inspirations and suggestions regarding location choice, emergence of hierarchies, spatial interactions through which he reaches a complex assessment of the spatial organisation of the regions. He puts primary stress on the population, its spatial distribution and movements, but he also emphasizes the role of such varied factors as the physical environment, land use and space use, distance, distribution of economic activities and wealth, cultural and political conditions, historical development of a territory etc. Owing to the period when the book was written, he, however, similarly as Haggett (1965), somewhat omits the role of human behaviour in the organisation of space and society assuming that everyone is in a fact *Homo Oeconomicus* obeying completely the principle of the maximum profit at the minimal effort. It is not that he does not mention the importance of human behaviour rather than he does not incorporate it to his proposed concepts and schemes. Morrill’s most important conclusion however is that the spatial organisation is best described by the intensity and extent of land use and by the complex interactions pattern, which a location has within its environment.

In the Czech geography, the issue of the spatial organisation of the society (as it is mostly put forward) is concerned in the works of Prague geographers (Hampl, Gardavský, Kühnl, 1987; Gardavský, 1988; Hampl, 2005). Their concept is, however, quite different and in a way limited (not to be understood negatively!). It takes into account, in its applications, only the population, particularly its distribution (concentration, settlement system) and movements (labour and

service commuting). They claim that natural, political, cultural, economic or social conditions are well reflected in the population characteristics and traits, although in his theoretical study Gardavský (1988) sees the regional (i.e. geographical) organisation as a complex and at the same time substantial arrangement and concurrent action of all geographical phenomena and processes. Such an approach is relatively easy to apply on larger geographical scales, which is its greatest advantage; on the other hand we think that particularly the interpretation of the results can be simplified in a way not regarding other than population factors.

First we have to admit that both above-mentioned approaches to the concept of the geographical organisation have been a great inspiration for us each having its pros and cons. Thus we have attempted to define our own approach to the concept. In order to assess the geographical organisation we see three important factors:

1. population (its distribution and interactions),
2. land use (in its very broad meaning including the location of activities and networks of different types), and
3. environment (physical, economic, cultural, political and social), when the crucial importance is possessed by the first factor. We think that this could be a deliberate compromise between too narrow orientation to the population and too vast identification of the geographical organisation with human geography as the whole. We also feel the need for introducing a system of constraints of non-economic and non-quantitative nature in order to represent reality in a better way.

It is also to be noted in this place that the hierarchical level of researched territory matters to a great extent. If we are for instance dealing with the inner structure (and organisation) of a city (for instance sections 3.1 and 4.1 of this contribution) our effort is centred merely around people, while large regions (on mezzo or macro level) should be apart from their population studied also in terms of their land use and environment. Approaches should be also slightly different and stress put on the above-mentioned factors slightly shifted in case we study either dynamic or static geographical organisation of a territory.

Our proposal of more general theoretical approach towards the assessment of the geographical organisation still has to be cleared up, refined and more precisely stated. The first concrete outcome linked to one of the projects including some theory but mainly application is a bachelor thesis (Niedzwiedzová, 2010) on the historical development of the spatial organisation of the Nový Jičín region during the industrial revolution. This, however, needs to be viewed as a purely preliminary attempt to grasp the issue of the spatial organisation differently in a way hinted at in the above lines. Other studies still will have to be carried out and completed.

Detailed discussion of the spatial organisation concept in human geography is beyond the scope, theme and purpose of this contribution. The preceding passages have attempted to introduce also a partial or alternative view of the concept within the Czech geography that could contribute to its more complete comprehension. However, examples of research given below are just mere fragments in the mosaic of the complex issue of the geographical organisation of space.

### **3. Research in spatial organisation: selected specifics and methodology**

The research primarily aims at an analysis of selected aspects of the spatial organisation at several hierarchical levels from microregional to national. Delineation of geographical regions and analysis of their inner structure is an underlying research task. Increased attention is paid to regional centres and to interactions with their hinterlands, both in spatial and temporal terms. The projects draw on quantitative and behavioural geographical methods and techniques and they are inspired by the significant social, economic and cultural transformations having occurred in the Czech Republic after 1990, and by their reflection in the spatial organisation of the geographical environment and the Czech society. All three projects are briefly characterised in the following chapters.

### 3.1 *Spatial models of behaviour*

The complexity of the spatial behaviour dynamics increases with individual motivations and interests, personal socio-demographic characteristics and cultural, political, economic and technological factors at a macro level. The principal objective of the Czech Science Foundation project (No. GA403/09/0885) "Spatial models of behaviour in a transforming urban environment: a time geographical approach" is to verify whether new phenomena appearing in the inner city structure after 1990 influence the spatio-temporal models of human behaviour and whether these models can contribute to municipal planning. The analysis pursues preferably the phenomena (i.e. "innovations" spreading in space and time) with a high leisure time potential, typically shopping malls or leisure centres, and population segments with a high amount of leisure time, high level of adaptability to the innovations and also relatively higher degree of social and economic dependence (students, women on maternity leave, and seniors).

The project is essentially based on the theoretical assumptions and methods of the time geographical school, particularly the use of space-time activity budgets recording daily trajectories of individuals and identifying their constraints. Phenomenological context and in-depth analyses of human behaviour are surveyed as well. The research is carried out in four cities (Brno, Ostrava, Olomouc and České Budějovice). As the Czech social sciences currently lack a complex research of the spatio-temporal human behaviour, we expect, apart from completing particular case studies, also a formulation of the generalised theoretical and methodological background that could be used in other similar researches.

The complex and relative character of the researched phenomena implies the use of trans-disciplinary and multi-paradigmatic approaches as related to the selection of research strategy. Both quantitative and qualitative methods of human geographical and sociological research are to be used to achieve partial research goals. The theoretical and methodological apparatus used in Time Geography (see e.g. Martensson, 1979; Friberg, 1993) provides tools for revealing space patterns of behaviour. The main data collection methods include various kinds of questionnaires in the form of time-space budgets, activity timetables, etc. The timetable method is frequently used in various sociological and marketing researches focused on studying everyday activities of individuals, their lifestyles, leisure time or shopping preferences, etc.; however these timetables recording time utilization and human activities in a specific time period (day, week, etc.) mostly leave out the space aspect, though. The time-space budget takes into account also spatial coordinates, i.e. specific localization of particular activity (Ira, 2001).

The research is focused on basic variables that structure the everyday activity schedule (according to Axhausen, 2002): (a) activity type, (b) activity location, (c) activity time, (d) activity time period, (e) size and composition of the social group where the activity proceeds, (f) realization costs (economic factor). The time-space budgets may also include the phenomenological context in the form of recording subjective feelings, evaluations and interpretations of partial activity significances from the acting persons' viewpoints, yielding qualitative data of greater informative value.

The specific population segments, whose behaviour is to be studied, should ideally feature a high level of adaptability to the innovation diffusion process and a relative abundance of leisure time. Students (with a fast adaptation to innovation at the primary stage of the diffusion process) comply with this condition in the pre-productive age. People in the post-productive age (they adapt to innovation during the later stages of the diffusion process, but much more carefully) are the second investigated segment. Families with children are the last investigated but a very strong segment, representing a rather wide population sample.

The acquired data will be converted into the Geographical Information System (GIS) environment for the analysis and visualization purposes. GIS was primarily designed for analyses, modelling and presentation of spatial data (mostly of static character) but it has been

recently enhanced with tools providing for a deeper investigation of changes in the acquired spatial data in time and their well-arranged presentation, mostly due to the 3D visualization/animation properties. These options provided GIS with a significant potential to become an important analytical tool for the research of time and space patterns of human activities (e.g. Kwan, 1999; Buliung; 2001), even though, as noted by Kwan (2004), their utilization in geography has been rather limited until recently (besides other things due to high financial and time costs spent on soft- and hardware, or rather on the computing operation time). Methods usable for the processing of time and space timetables include the following:

- Simple activity pattern in space-time, where each activity in the 3D model is plotted as a point with geographical coordinates  $x$ ,  $y$  and  $z$ , describing the starting time of the activity and the duration of the activity is represented by line length from the start point along the  $z$  axis direction,
- Generation of the 3D activity density surface, where a three-dimensional surface, whose “height” represents the spatial concentration of the activity, is generated by means of the kernel estimation method from the point distribution of the activities in space with geographical coordinates  $x$ ,  $y$ ,
- Geovisualization of individual space-time paths, essentially representing the application of the original concept of the space-time aquarium by T. Hägerstrand (1970).

### 3.2 Daily urban systems

Daily urban systems as a special case of the functional regions are analysed under The Grant Agency of the Academy of Sciences of the CR project (No. IAA301670901) “Spatio-temporal organisation of daily urban systems: an analysis and assessment of selected processes”. The term urban system, simply described as a set of interdependent urban places, was introduced by Berry (1964) as a part of his application of systems analysis and general system theory to the study of central city places. National territories are organized, according to proponents of the urban system approach, as a set of urban-centred regions – towns and cities plus their hinterlands – which together exhaust the land area and are articulated into a working system through networks along which goods, services, ideas, capital and labour flow. Economic functions are distributed in such a manner that each urban centre and its associated hinterland have a prescribed set of roles within the whole (according to Johnston et al. 2000).

In relation to Berry’s theory from the middle 1960s, the concept of the urban region became generally known by the end of the decade. It was achieved mainly by pioneering works of B. L. J. Berry (1967, 1970, 1973) in America and P. Hall (e.g. 1974 or 1980 with D. Hay) in Europe. Urban region is defined as a spatially continuous area, which is relatively closed in terms of daily migrations of the population to work, education, services, recreation and social contacts. Such a type of a functional region is more accurately termed as a daily urban system, which was according to Berry (1967) or Bezák (1990, 2000) proposed by Greek urbanist C. A. Doxiadis in 1967. The term “migration”, noted above, can be substituted in general terms by the word “interaction”, which serves better the concept of a functional region and its special case of a daily urban system. In most cases, labour commuting is used for the delineation of such regions because of insufficient data on other types of inter-regional relations. Works of Czech geographers led by M. Hampl delineate functional regions in the Czech Republic by labour commuting (e.g. Hampl, Kühnl, 1967) or by a combination of labour commuting and the interaction models (Hampl, Ježek, Kühnl, 1978; Hampl, Gardavský, Kühnl, 1987; Hampl et al., 1996). Regional delineation by Maryáš and Řehák (1987) dwells on a questionnaire survey on service attraction. Hampl (2005) or Mulíček, Sýkora (2008) based their delineation of functional regions dominantly on the labour commuting using the 2001 census data. Mulíček, Sýkora (2008) defined this regionalization as the local labour systems. As to foreign works, the functional regions or the daily urban systems in different variations were delimited by labour commuting data for example in the UK (Ball, 1980), Finland (Hirvonen, 1982) or Poland (Korcelli, 1982). Despite some notions in literature (e.g. Bezák, 1990) that labour commuting reflect relatively well a spatial structure of inter-regional contacts, our intention is, however, an attempt to delineate selected daily urban systems on the basis of the service commuting.

Two presuppositions have to be taken into account in this sense:

- the interaction must be based on the daily basis, i.e. the interaction comes out from the daily cycle of a person or a population segment,
- the intensity of the interaction has to exceed a certain critical value (so called level of significance); this value differs according to theme and objectives of the research.

The project has two main intentions:

- To use an interaction based on the commuting for retail services in order to delineate daily urban systems; at this, the interaction is either real - resulting from several types of surveys, e.g. with local authorities (e.g. Szczyrba et al., 2005), in selected retail facilities (e.g. Wokoun, 1983), in all settlements within the research area (e.g. Maryáš, 1987), or modelled by using the spatial interaction models (e.g. Isard et al., 1998),
- To analyse the internal structure of these areas on the basis of daily and weekly cycles of individuals.

Such a pursuit of the internal structuring of a daily urban system has not been very frequent in geography but it has its internal logic since the time span (i.e. one day) is usual both in the studies delimiting daily urban systems and in many studies, especially time geographical, on daily activities of individuals. The full research is carried out in two urban regions organised by the cities of Brno and Olomouc. Expected research results could provide a general insight into the spatial expression and reflection of social and economic transformation processes that have shaped our country since the end of the 1980s and could make a contribution to the regional planning.

### **3.3 Quantitative and graphic geographical methods**

The Grant Agency of the Academy of Sciences of the CR project (No. KJB300860901) "*Quantitative methods and synthesizing graphic methods in approximation, projection and modelling of geographical phenomena*" is concerned with more theoretical and methodological issues of the spatial organisation, though it provides examples of the application of selected methods. The project involves discussion and application of spatial interaction models and tackles also the question of the graphical expression of results. Methods leading to the fulfilment of the objective are diversified. They can be divided into two basic spheres – quantitative methods in the approximation, projection and modelling of geographical phenomena and synthesizing graphical methods in the approximation, projection and modelling of geographical phenomena. Partial objectives of the project, both methodological and of application character, include for instance regionalization of the Czech Republic and identification of nodal regions based on labour commuting and confrontation of this regionalization with the existing patterns of socio-economic geographical regionalization, application of spatial interaction models at a national level and their use in the geographical differentiation of space, assessment of the effect of borders as barriers and environmental linear components on the organisation of socio-geographical space in selected model regions, construction of synthetic graphical expression of the spatial organisation of model regions by adequate graphical tools, or verification of the possibilities of alternative definitions of masses and distances in the spatial interaction models and their calibrations.

The project has wide opportunities of practical use for planning and revision of partial components of the geographical organisation of the society (e.g. the correction and optimization of the administrative division, planning and optimization of communication network at a national and regional level etc.). Stress on the natural spatial interaction can contribute to more precise and effective proposals of strategies for regional development.

Primary use of quantitative methods in approximation, projection and modelling of geographical phenomena is usually related to the potential model, which is historically, conceptually and empirically connected with the gravitation model. This is also the very first spatial interaction model in geography. Introduction of mathematical models into geographical research, together with other analogies from other scientific disciplines, became a stimulus forming a base for the

development of gravitation theory and potential models in regional geography. The reason for introducing the gravitation and potential concepts lied in the need for an objective measure of the intensity of mutual spatial relations among geographical phenomena or areas.

Theoretical and methodological basis of the interaction potential model comprises primarily its mathematical expression, different forms of the model, conditions under which the model can be used, its limitations, possible deficiencies and problems connected with its use, ways of interpretation etc. This is discussed in the works of Isard (1960), Chojnicki (1966), Rich (1980), Tikunov (1985), Hlavička (1993) and others. The unfolding phase of theoretical and methodological basis of the interaction potential model is connected with the quantitative revolution; nowadays this type of research is a thing of the past and interaction models are not subject of research. These works are however helpful in gaining adequate theoretical and methodological background needed for the application of the interaction potential model.

Synthesizing graphical methods result in graphical models of spatial phenomena and processes. Graphical models are not demanding for mathematical and statistical data processing, however, they often reflect existing analyses of researched area. They are demanding as to the ability of seeking logical causes and coherences, detailed command of available information about the area and sound synthetic thinking and ability to express synthetically the most important information on selected segments of geographical space. This expression can be to a great extent schematic. In the generalised form we can divide graphical models of spatial phenomena and processes into the following categories: 1) graphical models with the representation of a spatial component (either individual or typological), and 2) graphical models without the representation of a spatial component.

#### 4. Applications in spatial organisation

This chapter presents some of the first research results. The first example deals with the regional centre and its inner structure in terms of time geographical concepts, the second example is concerned with the functional regions, and the third one shows a proposal of the graphical expression of the geographical organisation of space. This part attempts to illustrate the width and variety of possible approaches to the assessment and research of the spatial organisation of a territory.

##### 4.1 The city: stations and paths

The application of selected time geographical methods is illustrated in Figs. 1 and 2. Both examples present the city of Olomouc and daily movements (daily life) of the university students (53 of them filled the space-time activity budgets). Fig. 1 is concerned with a nature of spatial occurrences of students in the urban environment (Klapka, Roubalíková, 2010) in one of the crucial concepts of time geography: stations. In the time geographical concept, station is understood as any place where an individual spends a certain amount of time. Thus, in a daily path of an individual, stations possess a conspicuous trait reflecting on the fact that movements of individuals are not registered while staying there. The stations have temporal and spatial dynamics. It means that some stations disappear during a particular period, and that their concentration and spatial distribution depends on the character of the geographical environment.

Fig. 2 deals with another crucial time geographical concept: the path. A path can be conceived as daily (or seasonal or life) trajectory that comprises, unlike the stations, both temporal and spatial movements. Each path is defined in terms of the origin point and time, destination point and time, exact route between origin and destination points. Fig. 2 presents total path intensities during a day in the city of Olomouc based on the daily trajectories of university students regardless of the way of the movement (transport). The figure has a character of a graph where each portion limited by two vertices is considered as an edge. Each edge is then given a load according to the sum of single occurrences of the students along the edge during a day.



Fig. 1: Development of stations during a day – columns regard six defined time periods: from left to right 00:01–06:00, 06:01–08:00, 08:01–11:00, 11:01–13:00, 13:01–18:00, 18:01–24:00  
 Source: Klapka, Roubalíková, 2010

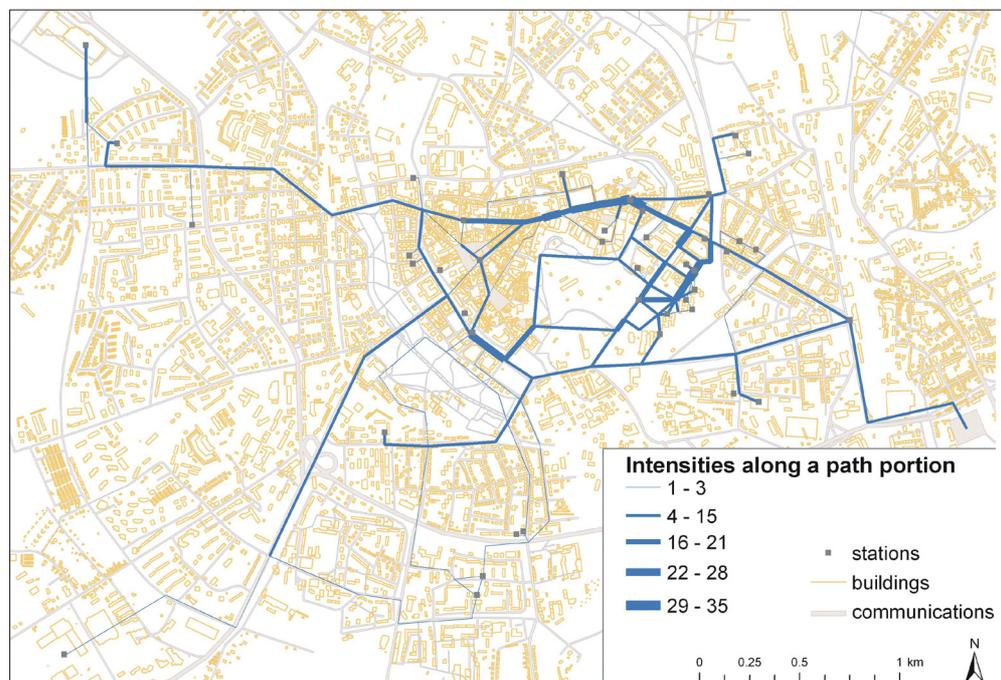


Fig. 2: Total paths intensities  
 Source: own design

**4.2 The region: daily labour commuting**

Delineation of regions according to daily labour commuting is one of the most applied methods used for the functional regionalization. In this chapter, we present the functional regionalization of South Moravia by nodal relations with a special attention to the functional region of Brno-City. Fig. 3 (see cover p. 3) puts forward a comparison of three methods delineating the functional region of Brno based on the same source data (labour commuting in the 2001 census), though providing different outcomes since the criteria were slightly different.

Halás et al. (2010) use the main flows of labour commuting to microregional centres as a crucial criterion. As the centre of commuting is considered a municipality that contains daily commuting from at least four more municipalities, which practically means that resulting micro-regions must include at least five municipalities. Hampl (2005) based his regional delineation dominantly on labour commuting and substituted school commuting (as an auxiliary criterion) for service attraction. Muliček, Sýkora (2008 – Sýkora, Muliček, 2009 respectively) defined local labour systems. The method of regions delimitation and their consequent image in the map is similar to Hampl (2005), small differences can be seen only in additional criteria resolving disputed cases of incompactness and unconnectedness of regions.

Fig. 4 (see cover p. 3) shows the functional region of South Moravia according to Halás et al. (2010). It explains basic differences among the method used by Halás et al. (2010) on the one hand and methods used by Hampl (2005), Muliček, Sýkora (2008) and Sýkora, Muliček (2009) on the other. The former considers as microregional centres also smaller municipalities mainly in the western part of the research territory while the latter assign their spheres of influence to the city of Brno. Thus, we have in Fig. 4 a chain of small microregions along a considerable portion of the border of Brno's sphere of influence (e.g. Tišnov, Moravský Krumlov, Hrušovany nad Jevišovkou, Hustopeče u Brna, Bučovice etc.).

#### **4.3 The space: choremes**

Graphical models (or choremes) are a strong tool for approximation and expression of the organisation of geographical space (Halás, Klapka, 2009). They are not demanding for mathematical and statistical data processing, but they ask for a high ability to search logical causes and consequences, for a synthetic thought and certain generalization. Their ambition is to define the most important spatial organisation forming processes and select them from the ones that are less fundamental. Their depiction can be to some extent schematic. Fig. 5 shows a matrix of 40 model situations, which is partly inspired by Brunet, Dolfus (1990).

### **5. Conclusions and implications**

The article presents three examples of tackling the issue of geographical organisation from different viewpoints at different hierarchical levels, at different levels of abstraction, by different means of expression (time space budget survey, nodal daily relations, graphical methods). The already acquired results have in our opinion important theoretical and practical implications. The tested and improved theoretical and methodological framework of research projects represents a tool for studying social geographical activities, which may reveal phenomena, relationships and contexts of human everyday life that are not primary objects of interest of other socially oriented sciences. The time-space approach to the research of behaviour modes provides an apparatus for the systematic research of human activities, their arrangement in the context of life projects, determination of their sequences, time periods and various forms of constraints, including their social and geographical positioning in the context of the physical environment (Friberg, 1993; Ira, 2001, Steinführer et al., 2010). The analysis of daily urban systems and their inner structure provides important knowledge on the geographical organisation of the space, particularly the space that is related to human mobility. Graphical means of expression also contribute to theoretical apparatus of the geography as a science. Moreover, the hitherto acquired results are going to help us to formulate our own view of the issue of the geographical organisation in terms of theory and methodology.

The preliminary research results imply also a wide future applicable potential with a possible use as a part of municipal transportation planning, general community planning, urban development, delineation of administrative regions etc. As emphasized by many authors (e.g. Schönfelder and Axhausen, 2003; Schwanen et al., 2008 etc.), results of similar research studies represent foundations for potential strategies aimed at improving life quality of selected population groups threatened by social exclusion or in the territorial planning and place branding of locations/areas predisposed for social-spatial marginalization. In a wider context, the same can be applied in the core-hinterland system (i.e. the city and its functionally

linked surroundings) at a micro or mezzo regional levels. More generally, the research results could enhance the general understanding of the social consequences of social and economic transformation processes that have shaped our country since the beginning of the 1990s. The particular significance for the economic and social practical utilization consists in influencing the land-space planning in different kinds of environments (city, region, state).

Spatial organization	Point	Line	Area	System	Model	
Fragment						Region
Network						Axial lattice
Regularity						Fractals
Entropy						Multiple nuclei
Hierarchy						Central places
Gravitation						Nodal regions
Contact						Border effects
Orientation						Suburbanization
Dynamics						Diffusion
Specialization						Relocation

Fig. 5: Synthetic matrix of choremes  
Source: Halás, Klapka, 2009

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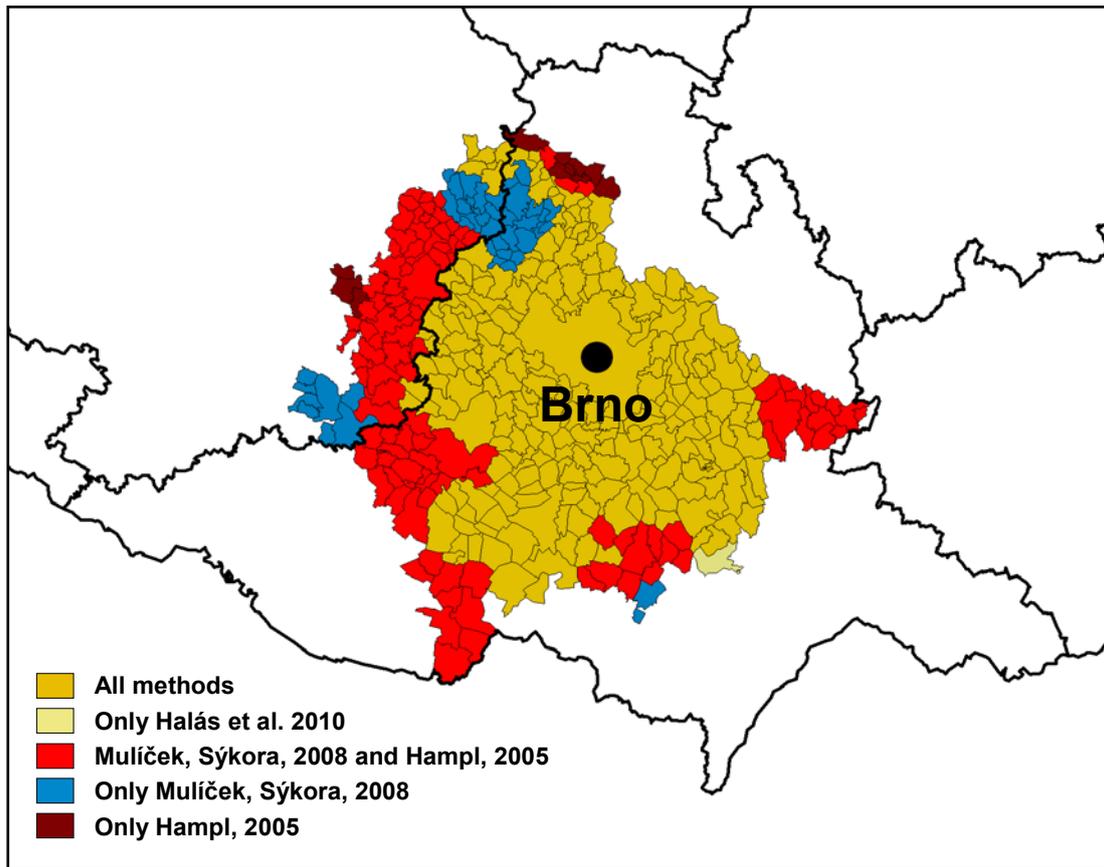


Fig. 3: Functional region of Brno: a comparison  
 Source: Halás et al., 2010; Hampl, 2005; Mulíček, Sýkora, 2008

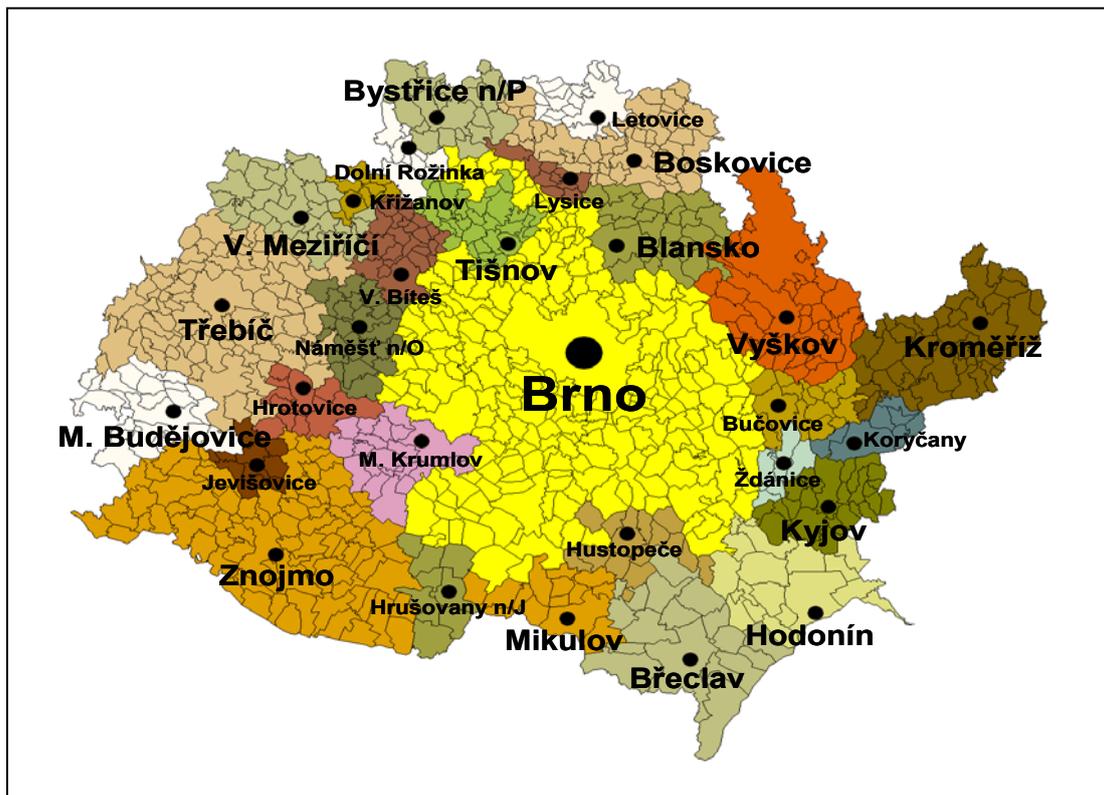


Fig. 4: Functional regions in South Moravia  
 Source: Halás et al., 2010